MOVING INTO THE FUTURE WITH NEW DIMENSIONS AND STRATEGIES:

A VISION FOR 2020 FOR WOMEN'S HEALTH RESEARCH

OFFICE OF RESEARCH ON WOMEN'S HEALTH
NATIONAL INSTITUTES OF HEALTH
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VOLUME III
PUBLIC TESTIMONY

Moving Into the Future With New Dimensions and Strategies: A Vision for 2020 for Women's Health Research

Office of Research on Women's Health
National Institutes of Health

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The views expressed in this volume are solely those of individuals testifying at the public hearings and do not necessarily reflect the positions or judgments of the National Institutes of Health, the U.S. Department of Health and Human Services, or the Administration.

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INTRODUCTION

The Office of Research on Women's Health (ORWH) was established in September 1990 in response to congressional, scientific, and advocacy concerns that a lack of systemic and consistent inclusion of women in NIH-supported clinical research could result in clinical decisions being made about health care for women based on findings from studies of men—without evidence that they were applicable to women. The Office was further established in statute in the NIH Revitalization Act of 1993 (Public Law 103–43). Congress codified the Office's mission and included directives that expanded its leadership role in identifying and promoting research on women's health.

Since that time, the Office has been the focal point for guiding the national research effort on women's health issues and is responsible for ensuring that women's health research priorities are integrated into the wider NIH research agenda. The mission of ORWH is to:

1. advise the NIH Director on matters relating to research on women's health;
2. strengthen and enhance research related to diseases, disorders, and conditions that affect women;
3. ensure that research conducted and supported by NIH adequately addresses issues regarding women's health;
4. ensure that women are appropriately represented in biomedical and biobehavioral research studies supported by NIH;
5. develop opportunities for and support recruitment, retention, reentry, and advancement of women in biomedical careers; and
6. support research on women's health issues.

To advance a robust research agenda to guide women's health research at the NIH, ORWH previously initiated two intensive planning initiatives, one beginning in 1991 and a second one in 1997. ORWH called upon experts in the fields of basic and clinical sciences, practitioners interested in women's health, and representatives of professional and women's organizations to develop specific and workable recommendations to advance research activities on behalf of the diversity of women and define the research priorities for women's health research at the NIH. The first research agenda from 1991, *The Report of the National Institutes of Health: Opportunities for Research on Women's Health* redefined the parameters of women's health to encompass the life span going beyond the reproductive system and to better understand sex and gender differences between women and men in development, health, and disease. It also brought attention to the need to focus on populations of women that had been underrepresented in clinical research. The 1997 report, *Agenda for Research on Women's Health for the 21st Century*, expanded upon the initial scientific agenda for women's health research and emphasized the relevance of the full spectrum of research from basic to clinical research, epidemiological and population studies, translation into clinical applications and health outcomes, with continued emphasis on sex and gender comparisons and the introduction of an emphasis on interdisciplinary research on women's health.

Science is dynamic and evolving at a remarkable pace with emerging knowledge from results of investigations and from new concepts of health and disease based on new technologies and approaches to research endeavors. Each decade has brought new discoveries, new understanding of the intricacies of molecular contributions to health and the workings of the totality of the human body, and new opportunities to leverage the knowledge from science to improve human health and, specifically, women's health. The first two reports ensured that women's health rose to prominence within the national psyche, as well as within the research environment. The next 10 years can bring new research advances with improved therapeutics based on sex differences with an expansion of the evidence based clinical application to women's health care. Achieving new dimensions and innovative strategies for research is an important element of the NIH women's health research agenda for the future.

Moving Into the Future With New Dimensions and Strategies: A Vision for 2020 for Women's Health Research

Ten years after the last women's health research agenda was updated, the ORWH launched a series of five regional scientific workshops and public hearings to ensure that research on women's health continues to be on the cutting edge of science, based upon the most advanced techniques and methodologies. Four of the five regional scientific workshops were held during 2009, and the final was in 2010. The meetings were hosted by five universities:

1. Washington University, St. Louis, Missouri, March 4–6, 2009
2. University of California, San Francisco, May 27–29, 2009
3. Women and Infants Hospital/Brown University, Providence, Rhode Island, September 21–23, 2009
4. Northwestern University, Chicago, Illinois, October 21–23, 2009
5. Emory University, Atlanta, Georgia, February 16–17, 2010

The format of each of the regional scientific workshops was designed to promote an interactive discussion involving leading scientists from across the nation, women's health advocates, public policy experts, health care providers, and the general public. Individuals representing the full spectrum of academic institutions, professional associations, advocacy organizations, health care facilities interested in biomedical and behavioral research on women's health and sex/gender issues, or those wishing to present their personal opinions on these issues were encouraged to provide both written and public testimony at each of the regional meetings. In each of the meetings, the ORWH Director challenged conference attendees to think beyond traditional women's health issues in defining the women's health research agenda of the future. Participants were asked to give attention to new areas of scientific application, innovative technologies, and sex differences research in basic and laboratory investigations. Clinical questions for which documented answers are still not evident were to be considered in determining research priorities, recognizing the importance of new health care and research paradigms that will be facing the Nation in the years ahead.

A total of 37 scientific and career development working groups were co-chaired by research scientists representing 44 academic institutions and 19 NIH institutes, centers and the Office of the Director. Participants came from thirty-three states, and scientists from Great Britain and Australia also contributed to the discussions. Scientific panels and concurrent workshops addressed a wide range of topics, from the interplay of research and health care to specific areas of research, resulting in nearly 400 recommendations. The working group reports and recommendations are found in the companion Volume II to the ORWH Strategic Plan.

A key element of each of the regional meetings was the time devoted to receiving public testimony. From its earliest establishment, ORWH has actively welcomed input from advocacy organizations, health and disease interest groups, health care providers, and the general public. Over the years, public testimony has served as an important reality gauge to inform the research agenda-setting process. During the course of the five meetings, 141 organizations and individuals presented written and public testimony, always on the first day of the meeting. The testimonies from the meetings are found in Volume III of the ORWH Strategic Plan.

At the conclusion of the five regional workshops, the working group reports and recommendations were synthesized by ORWH staff and the resulting document (Vol. 1) was reviewed by three separate groups: (1) the Advisory Committee on Research for Women's Health (the non-Federal advisory committee to the Director of ORWH); (2) an outside group of experts in women's health research convened April 14, 2010 at the NIH; and (3) the Coordinating Committee on Research on Women's Health Research/NIH (composed of NIH institute and center directors or their designees). The final document, entitled *Moving Into the Future With New Dimensions and Strategies: A Vision for 2020 for Women's Health Research*, represents the conclusion of an intensive 2-year national planning discussion. This new Strategic Plan for research and career development opportunities to guide efforts towards the year 2020 is being unveiled on September 27, 2010 as part of the 20th anniversary celebration of the establishment of the ORWH at the NIH.

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St. Louis, Missouri
March 4, 2009

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AAUW of Missouri

Improve Girls' and Women's Opportunities in Science, Technology, Engineering, and Math

My presentation is taken in part from an AAUW (formerly known as the American Association of University Women) document entitled, "Improve Girls' and Women's Opportunities in Science, Technology, Engineering, and Math." AAUW, founded in 1881, has approximately 100,000 members (in Missouri, approximately 1,000 members and 25 branches across the State). AAUW advances equity for women and girls through advocacy, education, and research.

The American Association of University Women (AAUW) supports promoting and strengthening science, technology, engineering, and mathematics (STEM) education, especially for girls and other underrepresented populations. The lack of women and girls in STEM fields has significant implications for women's economic security as well as the overall economy and America's global competitiveness. Fortunately, the United States has an untapped pool of potential workers. If women and members of other traditionally underrepresented groups joined the STEM workforce in proportion to their representation in the overall labor force, the shortage of STEM professionals would disappear.[1] AAUW supports the following efforts to improve girls' achievement in math and science and increase the number of women who choose STEM careers.

1. Enact recommendations from *Beyond Bias and Barriers*. The National Academies' report, *Beyond Bias and Barriers,* found that women face a lifetime of subtle biases that discourage them from STEM careers. To overcome these challenges, AAUW supports enactment of the report's recommendations, which would require agencies that fund scientific research to conduct antigender-bias workshops, enforce existing Federal antidiscrimination laws (including Title IX), publish demographic and funding data for grant applications, and extend grant support for researchers on caregiving leave. AAUW strongly supports the report's recommendation that colleges form an interinstitutional monitoring organization like the National Collegiate Athletic Association, which shares data, evaluates progress, and works to eliminate gender bias in faculty recruitment, retention, and promotion in the STEM fields.
2. Ask for a report responding to *Rising Above the Gathering Storm*. The report, commissioned by Congress from The National Academies of Science and Engineering, and the Institute of Medicine and published in 2007, states that the United States' advantages in science and technology are eroding and discusses the need to improve math and science education. Unfortunately, the report largely ignores the issue of women and underrepresented minorities in STEM fields. AAUW recommends a followup report on methods to increase the number of women in STEM fields and what effect this would have on enabling the United States to remain a leader in the global marketplace.
3. Use Title IX to improve the climate for women in STEM fields: AAUW recommends requiring agencies to proactively conduct Title IX compliance reviews at grantee institutions. All agencies are required to ensure they are not violating Title IX; however, very few Title IX reviews are conducted outside of the Department of Education. Agencies should ensure that universities that receive agency funding are complying with Title IX.

4. Measure student achievement in science. AAUW supports measuring student achievement in science. This will provide schools with necessary information on how well students are progressing and the improvements that still need to be made. The data gathered from such testing programs should always be disaggregated by sex, race, and socioeconomic status; and cross-tabulated. While testing is an important measure of success, high-stakes testing should not be the sole indicator of student competency or a school's progress. Additional flexibility in Adequate Yearly Progress (AYP) measures required by the No Child Left Behind Act should be explored.

5. Teacher training. AAUW supports efforts that create more STEM teachers and train teachers to encourage girls and other underrepresented groups to pursue math and science careers in the face of gender-based differences, peer pressure, and parental expectations. This is particularly important because while studies show that all students start to lose interest in science and math by junior high, the loss is particularly steep for girls at puberty and results from gender-based social expectations and peer pressure.[1]

6. Encourage the inclusion of STEM subjects and activities in cocurricular programs. Incorporating STEM subjects and activities in after-school and summer programs enables students to explore the field in a supportive atmosphere. Research suggests that information about the usefulness of engineering to everyday life and hands-on experiences with science, math, and technology help girls develop a sustained interest in these fields.

Missouri challenges. Our challenges in Missouri include educating parents and peers about the value of STEM education. In some places in Missouri, the term "STEM" is so negatively associated with stem cell research that we've had to use a new acronym, METS, to define math, engineering, technology, and science. Partly because of negative parental pressure, State education offices struggle to enroll girls in technical education programs that potentially would pay them more than traditionally female occupations.

But in Missouri, we do have a number of programs that are listed in the National Girls Collaborative Project, including programs in Springfield, at Missouri S&T in Rolla, at Washington University, and at the St. Louis Science Center. Community organizations such as AAUW work with educational institutions to find ways to show girls these opportunities. I urge increasing support for these projects.

Women make up half of the population and are a largely untapped resource that could prove essential in maintaining the technological competitiveness of the United States. With better enforcement of Title IX and increased investment, the United States can begin to close the gender divide in STEM fields.

Reference

1. Congressional Commission on the Advancement of Women and Minorities in Science, Engineering and Technology Development. (2000). *Land of plenty: Diversity as America's competitive edge in science, engineering and technology* [Report]. Retrieved from http://www.nsf.gov/pubs/2000/cawmset0409/cawmset_0409.pdf

KRISTIAN HURLEY

American Autoimmune Related Diseases Association

Autoimmune Diseases: A Women's Health Issue—Recommendations for Research Priorities from the American Autoimmune Related Diseases Association in Collaboration with the National Coalition of Autoimmune Patient Groups

Autoimmune Diseases: A Women's Health Issue

Named a major women's health issue by the Office of Research on Women's Health (ORWH) at the National Institutes of Health (NIH), autoimmunity is the underlying cause of more than 100 serious, chronic illnesses. Women are the primary targets of these autoimmune diseases—they represent about 75 percent of the patients. It has been estimated that autoimmune disease treatment costs more than $100 billion per year.

The term "autoimmune disease" refers to a family of genetically and clinically interrelated illnesses. They involve almost every human organ and system, including diseases of the nervous, gastrointestinal, and endocrine systems; skin and other connective tissues; eyes; blood and blood vessels. In all of these diseases, the underlying problem is the same—the body's immune system becomes misdirected and attacks the very organs it was designed to protect.

Autoimmunity and Women

Taken together, autoimmune diseases strike women three times as often as men. Some diseases have an even higher incidence in women (Table I). For example, 9 out of 10 people who have lupus are women. Of the estimated 50 million Americans living with autoimmunity, 30 million are women.

Autoimmune disease is 1 of the top 10 leading causes of deaths among U.S. women age 65 and younger. Moreover, these diseases represent the fourth largest cause of disability among women in the United States.

Different ethnic groups are more susceptible to certain autoimmune diseases. In lupus, for example, African-American, Hispanic, Asian, and Native American women are two to three times more likely to develop the disease than Caucasian women.

Autoimmunity: A New Disease Category

Just as cancer is an umbrella category for a range of diseases (leukemia, breast cancer, prostate cancer, non-Hodgkin's lymphoma, etc.), autoimmune disease also represents a group of genetically and clinically interrelated illnesses. Autoimmune diseases cross the different medical specialties, such as rheumatology, endocrinology, hematology, neurology, cardiology, gastroenterology, and dermatology. Specialists tend to focus on singular diseases within their particular category. But this must change since autoimmune diseases tend to cluster in individuals and families, making it very difficult for patients with multiple autoimmune illnesses (a common occurrence) to get comprehensive, coordinated treatment.

Diagnosis and Women

Table I: Female to Male Ratios in Autoimmune Diseases

Systemic lupus erythematosus	9:1
Hashimoto's thyroiditis	10:1
Sjögren's syndrome	9:1
Antiphospholipid syndrome-secondary	9:1
Primary biliary cirrhosis	9:1
Autoimmune hepatitis	8:1
Graves' disease	7:1
Scleroderma	3:1
Rheumatoid arthritis	2.5:1
Antiphospholipid syndrome-primary	2:1
Autoimmune thrombocytopenic purpura (ITP)	2:1
Multiple sclerosis	2:1
Myasthenia gravis	2:1
Rheumatoid arthritis	2.5:1

Getting a proper diagnosis is sometimes as difficult as living with an autoimmune disease itself. Victims face problems because physicians often don't think of autoimmunity as a possible diagnosis. Women, especially those in the childbearing years, have an especially hard time. Often, women who suffer from autoimmune diseases are not taken seriously when they first begin consulting their doctors. Their symptoms are likely to be vague in the beginning, with a tendency to come and go, and hard to describe accurately to a physician. In a typical scenario, she is often shunted from specialist to specialist and forced to undergo a battery of tests and procedures before a correct diagnosis is made, which can sometimes take years.

According to a 2001 survey by the American Autoimmune Related Diseases Association (AARDA), more than 45 percent of patients with autoimmune diseases have been labeled chronic complainers in the earliest stages of their illness. This can be devastating to a young woman who may then begin to question her sanity as she tries desperately to find out what is wrong. Tragically, many of these patients suffer significant damage to their organs and end up carrying this health burden with them for the rest of their lives because of the delay in diagnosis.

If the public, particularly women, and medical practitioners were more aware of the genetic predisposition to develop autoimmune disease, clearly there would be more emphasis on including familial autoimmune disease when taking a medical history on a patient who presents with confusing symptoms. Earlier consideration of and testing for these diseases could only prevent significant and lifelong health problems.

An example is antiphospholipid antibody syndrome (APS). In this disease, the patient produces antibodies against phospholipids—fat found in every cell wall. The major consequence of APS is blood clotting, which can cause stroke, miscarriages, migraine headaches, and clotting disorders. APS occurs by itself or may accompany many of the other autoimmune diseases. It is a significant cause of strokes in women under the age of 35 as well as recurrent miscarriage. Yet it would be unusual for a patient with an autoimmune disease other than lupus to be checked for it. APS has also been indicated as a causative factor in cardiovascular disease in women. APS can be treated simply with a baby aspirin or other blood thinner given to prevent strokes, miscarriage, and blood clots. The sad fact, however, is that many patients who could be treated in such a manner are never identified until after they have had a heart attack, stroke, or miscarriage.

Highest Priority Research Recommendations for the National Institutes of Health/Office of Research on Women's Health

AARDA, in collaboration with the National Coalition of Autoimmune Patient Groups (NCAPG), recommended that NIH/ORWH provide maximum available resources into the following high priority research areas:

Sex Bias in Autoimmunity

Autoimmune diseases affect women disproportionately more often than men, some as high as 9:1. Although there has been some research into sex bias differences in autoimmune disorders, there is no substantial research into this area. It is commonly thought that hormones may play a significant role in the unbalanced nature of the diseases in women in comparison to men. For example, many autoimmune diseases seem to occur more often in women who have completed menopause, while other disorders may significantly improve during pregnancy with no outward provocation. Although these findings seem to point to an obvious link, the role of hormones in autoimmune disorders has not been conclusively proven. Recent findings indicate a need for more research concerning pregnancy influences on the incidence and natural history of autoimmune diseases.

Autoimmune Disease Biomarkers

NIH should focus considerable efforts into research on biomarkers for the more than 100 autoimmune diseases. There is a critical need for the creation of a database of autoimmune disease biomarkers. This database would assist in tracking the relation of biomarkers to disease severity. In addition, there is a need to develop a differential diagnosis technique to use groups of biomarkers to determine the presence of specific autoimmune diseases. The last item is based on the concept that autoimmune diseases can be determined by looking for groups of biomarkers as though they were chords played on a piano. There is also a need to expand autoimmune disease research to include the relationship between these diseases and other serious health conditions.

Genetic Predisposition and External Triggers

There are more than 80 known and 40 suspected autoimmune diseases afflicting as many as 24.5 million Americans. These diseases are genetically interrelated, tending to cluster in individuals and families. An individual's susceptibility to autoimmune diseases is determined by that individual's set of genes. However, studies on identical twins show only a 30–50 percent concordance in autoimmune disease expression. Therefore, genetic makeup alone does not determine whether someone will "get" an autoimmune disease. There are other risk factors, external to the body, involved in initiating and exacerbating the disease process.

It is common knowledge that autoimmune disorders are on the rise. While one-third of the risk of developing an autoimmune disorder lies in one's genetic makeup, the remaining causes are thought to be noninherited and may contain several environmental factors. For example, exposure to certain metals, such as mercury, gold, and silver are thought to induce lymphocyte proliferation and subsequent autoimmunity.

While our current understanding of the role environmental factors play in the autoimmune attack remains rudimentary, a wide range of triggers have been implicated in autoimmune disease expression, including the following:

- Viral and infectious agents
- Broad groups of chemicals
- Heavy metals
- Iodine
- Organic compounds (including PCBs and estrogenic compounds)
- Phthalates
- Pharmaceuticals
- Pesticides
- Some foods such as gluten and cow's milk
- Ultraviolet radiation

More research in this area is required to fully understand the relationship between environmental factors and autoimmune diseases that affect millions of Americans at an increasingly higher rate each year. It is imperative that we understand the full range of environmental triggers and the role they play in the autoimmune process. Understanding how environmental factors fit into the autoimmune attack puzzle may provide approaches to preventing these diseases or reducing their severity. This is certainly more desirable than trying to control an ongoing autoimmune attack with immunosuppressive drugs that expose patients to many well-known serious side effects.

AARDA, therefore, strongly recommends to the NIH ORWH that a coordinated research program be initiated to better understand the role of environmental triggers across the family of autoimmune diseases. The ultimate goal of this program is the development of approaches to prevent autoimmune diseases or decrease their severity, thereby minimizing the very serious financial and societal burdens they place on our healthcare system and on afflicted individuals and their families.

Awareness Through Education

Lastly, we recommend that the NIH Office of Research on Women's Health sponsor a cross-institute scientific meeting to examine the latest in research on the issues discussed above in order to identify additional areas of opportunity in autoimmune disorders research.

About the American Autoimmune Related Diseases Association

The American Autoimmune Related Diseases Association is dedicated to the eradication of autoimmune diseases and the alleviation of suffering and the socioeconomic impact of autoimmunity through fostering and facilitating collaboration in the areas of education, public awareness, research, and patient services in an effective, ethical, and efficient manner.

AARDA is the only national nonprofit health agency dedicated to bringing a national focus to autoimmunity, the major cause of serious chronic diseases. Approximately 50 million Americans, 20 percent of the population, or one in five people, suffer from autoimmune diseases. Women are more likely than men to be affected; some estimates say that 75 percent of those affected—some 30 million people—are women. Still, with these statistics, autoimmunity is rarely discussed as a women's health issue.

Autoimmunity is a result of a misdirected immune system that causes one's own immune system to attack the self. There are more than 80 known autoimmune diseases; and unlike the many forms of cancer that are recognized as being part of the general term, "cancer," autoimmune diseases are recognized singularly rather than in the overall category of autoimmunity. The public in general is unaware of the autoimmune nature of these diseases. When most people hear one of these diseases referred to as an autoimmune disease, they incorrectly confuse the term autoimmune with acquired immune deficiency syndrome (AIDS); or they think it is a form of cancer.

This lack of knowledge and collaborative effort results in untold suffering for persons with autoimmune diseases due to misdiagnosis and delayed diagnosis, which may result in damage to vital organs. The need to bring a national focus to autoimmunity as the common factor in all autoimmune diseases is vital in order to bring a collaborative effort to research, funding, early detection, and eventually, prevention and cure for all autoimmune diseases.

Some of the more than 80 autoimmune diseases are lupus, type I diabetes, scleroderma, celiac, multiple sclerosis, Crohn's disease, autoimmune hepatitis, rheumatoid arthritis, Graves' disease, myasthenia gravis, myositis, antiphospholipid syndrome (APS), Sjögren's syndrome, uveitis, polymyositis, Raynaud's phenomenon, and demyelinating neuropathies.

About the National Coalition of Autoimmune Patient Groups

Mission: To consolidate the voice of autoimmune disease patients and to promote increased education, awareness, and research into all aspects of autoimmune diseases through a collaborative approach.

- American Autoimmune Related Diseases Association
- American Behçet's Disease Association
- American Vitiligo Research Foundation
- APS Foundation of America
- Arthritis Foundation
- Celiac Disease Foundation
- Coalition for Pulmonary Fibrosis
- Crohn's and Colitis Foundation of America
- Endometriosis Association
- Gluten Intolerance Group
- International Pemphigus & Pemphigoid Foundation
- Lupus Alliance of America
- Lupus Foundation of America
- Lupus Foundation of Mid and Northern New York, Inc.
- The Myositis Association
- Myasthenia Gravis Foundation of America
- National Adrenal Diseases Foundation
- National Alopecia Areata Foundation
- National Kidney Foundation
- National Multiple Sclerosis Society
- National Psoriasis Foundation
- National Sleep Foundation
- Platelet Disorder Support Association
- Scleroderma Foundation
- Sjögren's Syndrome Foundation
- Takayasu's Arteritis Research Association
- Vasculitis Foundation (formerly Wegener's)
- Vitiligo Support International

DONNA VALLONE, PH.D., AND CHERYL HEALTON, DR.P.H.

American Legacy Foundation

Including Tobacco in the ORWH Research Agenda: An Essential Step Toward Improving the Health of American Women

The board of directors and the staff of the American Legacy Foundation® (Legacy) urge the Office of Research on Women's Health (ORWH) to give the prevention of tobacco use, smoking cessation, and tobacco-related disease a prominent position within the research agenda being developed for the National Institutes of Health (NIH) ORWH. Including tobacco in the ORWH research agenda is a critical first step toward improving the health of women in the United States.

Smoking Is a Social Justice Issue

National Health Interview Survey data show that, in 2007, 17 percent of all women over age 18 in the United States were smokers, with substantially higher smoking rates among women with lower levels of education and income.[1] For example, 39 percent of women with a GED-level education smoked in 2007, as did 26 percent of women living below the Federal poverty level.[1] In fact, as a result of decades-long trends in which those with greater educational and financial resources smoke at lower rates,[1,2] quit at higher rates, [2,3,4] are more likely to be covered by health insurance,[5] and are more likely to promptly seek medical care,[5] tobacco use has become not only a public health issue, but also a social justice issue.[6]

While the relationship between socioeconomic status and tobacco has been well documented, there are certain populations within which smoking rates are believed to be high, and yet a scarcity of data often relegates these groups to the sidelines of tobacco control interventions. Among these populations are gay, lesbian, bisexual, and transgender individuals and racial/ethnic minorities, such as American Indians and Alaska Natives.[7] Disparities are compounded by the fact that smoking translates into mortality at different rates within different population groups. For example, African-American women smoke at lower rates than White women, but have higher death rates resulting from cancer.[8] A great deal more research will be needed before we can unravel the many factors influencing smoking and smoking-attributable disease and death in these populations.

Smoking-Attributable Morbidity, Mortality, and Costs to Society

Between 2000 and 2004 (the most recent data available), the Centers for Disease Control and Prevention (CDC) estimated that 173,940 U.S. women died annually as a result of tobacco-related disease.[9] The leading causes of smoking-attributable death among U.S. women were heart disease, cerebrovascular disease, and lung cancer.[9] It is further estimated that approximately 18,000 U.S. women died annually during the years of the study period as a result of exposure to secondhand smoke.[9] Collectively, these deaths represent more than 2 million years of potential life lost to U.S. women each year.[9] Furthermore, in each year from 2000 to 2004, the CDC estimated that 776 infant deaths were caused by smoking during pregnancy.[9] In addition to the devastating impact of these deaths on families who have lost mothers, wives, daughters, and children to tobacco-related disease, the average annual productivity costs of these deaths are estimated by the CDC to be $33 billion.[9]

Smokers Underestimate Risk and the Addictiveness of Nicotine

While the vast majority of women today know that smoking is harmful to their health, many fail to fully understand the risks smoking poses to themselves, their families, and their children. For example, although lung cancer has been the leading cause of cancer death among women since 1987, a Legacy study shows that 80 percent of women in the United States mistakenly believe that breast cancer is the primary cause of cancer death among women.[10] Furthermore, girls and young women overestimate their ability to quit smoking; survey data show that more than half of teens who currently smoke do not expect to be smoking in 1 year.[7] Unfortunately, tobacco is highly addictive, so while most smokers—including teenage girls—report wanting to quit, very few are successful in a given year.[7,11] One study showed that, among girls who smoked, 60 percent of those in middle school and 58 percent of those in high school had tried and failed to quit smoking during the previous year.[7] Survey data show us that of the approximately 43 million smokers in the United States, the majority of whom report wanting to quit, fewer than 5 percent will successfully quit within a 1-year period.[1,11]

The State of Cessation Interventions

In recent years, the science related to smoking cessation has advanced markedly; a combination of pharmacotherapy, counseling, and social support can vastly improve a smoker's chances of successfully quitting.[12] Based on evaluations of mass media cessation efforts in California, Massachusetts, and Oregon—in which high-intensity, research-based, paid media campaigns were combined with excise tax increases and community and school-based programs—the Task Force on Community Preventive Services "strongly recommends" mass media campaigns to increase tobacco cessation when the media campaign is combined with other interventions.[13] However, recent research suggests that many mass media interventions, which have been successful overall, have in fact done a poor job of reaching those most in need—disadvantaged and low socioeconomic status smokers.[14,15,16] Greater attention must be paid to 1) developing interventions that will influence smoking cessation within these high-risk populations, including women; and 2) evaluating interventions in such a way that overall program success does not mask failure to influence important subgroups.

The Tobacco Industry Encourages Smoking Among Women

It is worth bearing in mind that the cessation interventions of the tobacco control and public health communities are continually undermined by billions of dollars worth of tobacco industry marketing and promotion. Just this week, the American Cancer Society Cancer Action Network, American Heart Association, American Lung Association, Robert Wood Johnson Foundation, and Campaign for Tobacco-Free Kids released a report called, *Deadly in Pink: Big Tobacco Steps Up Its Targeting of Women and Girls.*[17] The report describes how two tobacco companies—Philip Morris and R. J. Reynolds—have recently "stepped up" tobacco marketing directed toward women and girls, threatening to undermine the advances made in recent years by the tobacco control and public health communities. The report describes two new products: Philip Morris' Virginia Slims "purse packs," released in October 2008; and R. J. Reynolds's "Camel No. 9" released in January 2007. The report concludes that, given the aggressive marketing of these new products, these tobacco company efforts could be "devastating" to smoking-initiation rates among girls and, ultimately, to women's health.

A separate study conducted by American Legacy Foundation indicated that after the first 6 months of the Camel No. 9 marketing campaign, more than 40 percent of youth (12–17) and young adult (18–24) smokers had tried the product and that many more planned to try it. Furthermore, interest in trying Camel No. 9 was high even among young adults who were not current smokers, suggesting that the product may serve to lure new smokers (Legacy data available upon request).[18] Given these emerging female-oriented tobacco products and marketing efforts, combined with the enormous promotional budget of the tobacco industry—$13 billion in 2005, the most recent data available[19]—it is of paramount importance to track the impact of these products on initiation, smoking rates, and quit rates among girls and young women.

Setting a Research Agenda for Women and Tobacco Use

The authors of the 2001 Surgeon General's report on women and smoking set a research agenda to "build the science-base on gender-specific outcomes and on how to reduce disparities among women."[7] Moreover, the American Legacy Foundation has noted gaps in the research that has emerged since the time of the 2001 report. The following are presented as specific areas of research that Legacy believes should be pursued by the ORWH in an effort to improve the health of women in the United States:

1. Conduct research to better understand why so many mass media cessation campaigns have been less effective or ineffective among disadvantaged or lower socioeconomic status populations
2. Conduct research to learn how new media and Internet cessation services can be used to increase smoking cessation among women, and whether they can be effectively used across the socioeconomic spectrum
3. Conduct research regarding smoking rates, smoking patterns, cessation rates, and factors associated with initiation and quit success among high-risk populations such as gay, lesbian, bisexual, and transgender individuals; minority racial/ethnic populations; population groups targeted by the tobacco industry; and lower education/lower income population groups
4. Conduct research regarding tobacco products designed for and marketed to women specifically, whether they vary significantly in terms of the levels of known carcinogens and how this relates to lung cancer histology
5. Conduct research to further explore the link between smoking and health outcomes among women, such as breast cancer and reproductive outcomes
6. Conduct research to better understand how secondhand tobacco smoke impacts women who do not smoke
7. Encourage scientists to report gender-specific results whenever possible when reporting on research about factors that influence smoking initiation or cessation, the health effects of tobacco, and new tobacco products

Considering the toll of tobacco use on the health of American women, research into tobacco and tobacco-related diseases is underfunded. There is still much we need to learn so that we

can prevent youth initiation, help adult smokers quit, and deliver care to women who suffer from tobacco-related disease.

The American Legacy Foundation

Legacy is a national, independent public health foundation created in 1998 out of the landmark Master Settlement Agreement ("MSA") between the tobacco industry, 46 State governments, and 5 U.S. territories. Our mission is to build a world where young people reject tobacco and anyone can quit. Legacy does not lobby or take positions on specific legislation. Our programs include the following:

- EX®—A groundbreaking and innovative smoking cessation public education campaign designed to help smokers "re-learn" life without cigarettes.
- truth®—A national youth smoking prevention media campaign cited as contributing to significant declines in youth smoking.
- Research Initiatives—Examining how public health public education can reduce smoking initiation and prompt smoking cessation.
- Outreach to Priority Populations—Targeted outreach to underserved and minority communities using methods that are culturally competent and tailored to improve the reach and retention of programmatic efforts.

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CLAIRE SAXTON

Bladder Cancer Advocacy Network

Women and Bladder Cancer Research

The Bladder Cancer Advocacy Network (BCAN, pronounced "beacon") is the first national advocacy organization dedicated to improving public awareness of bladder cancer and increasing research directed toward the diagnosis, treatment, and cure of the disease. BCAN works to raise awareness of bladder cancer among the general public and medical community; to advocate for allocation of additional governmental and private funds to research programs directed to the diagnosis, treatment, and cure of bladder cancer; to provide services to bladder cancer patients, their caregivers, and their loved ones; and to directly fund and increase bladder cancer research. Founded in May 2005, BCAN is a cooperative effort among bladder cancer survivors, their families and caregivers, and the medical community.

Women and Bladder Cancer Research

Bladder cancer has long been considered a disease of older men. Though it is more prevalent in men, studies have shown that women are more likely to present more advanced tumors and have a worse prognosis than men at almost every stage of the disease. According to a report published by the National Cancer Institute, the survival rate for women with bladder cancer lags behind that of men at all stages of the disease. African-American women in particular have poor outcomes when diagnosed with bladder cancer. They present with the highest proportion of advanced and aggressive tumors when compared to African-American men and Caucasian men and women. In addition, the number of women diagnosed with bladder cancer has been increasing.

In many cases, there are significant delays in diagnosing bladder cancer in women. Many women ignore the most basic symptom—blood in the urine—which they may associate with menstruation or menopause and delay reporting this symptom to their doctors. Even after reporting the problem to their doctors, blood in the urine may be initially misdiagnosed as a symptom as postmenopausal bleeding, simple cystitis, or as a urinary tract infection. As a result, a bladder cancer diagnosis in women can be overlooked for a year or more.

However, according to a research study published in the January 1 issue of the journal, *Cancer*,[1] the increased lethality of bladder cancer in women (and African Americans) cannot be explained away simply by age, tumor type, and stage of the disease upon diagnosis. In fact, less than one-third of the difference in lethality between White men and women can be explained away by these factors.

So what other important factors help explain the increased lethality of bladder cancer in women (and African Americans)? Other than being diagnosed at a later stage, why else is bladder cancer almost twice as lethal in women, who are a third less likely to get the disease? Do hormonal differences help account for bladder cancer's increased mortality in women? The sad reality is that there has not been enough research done on women and bladder cancer to answer this question.

The Impact of Bladder Cancer on Women

In 2008, approximately 17,500 women were diagnosed with bladder cancer and approximately 4,150 women died from this disease in the United States. To put a face to the devastating impact that bladder cancer and what the lack of research and physicians' awareness of bladder cancer in women has on those affected by bladder cancer, we are sharing the story of one of BCAN's volunteers.

Karen, who was diagnosed in the fall of 2003, experienced a delay of more than 3 years between the first symptom of blood in her urine and being diagnosed with bladder cancer. "In retrospect, the symptoms of bladder cancer had been there since 1999, when my general practitioner had first found microscopic blood in my urine sample, but dismissed it as 'normal' for me." By the time it was diagnosed, Karen's bladder cancer had progressed to stage 2 and had invaded the muscle wall of her bladder. Her treatment required a long, complex surgery that included complete removal of her bladder and having a "neobladder" fashioned out of her intestines. Today, her life has gone back to a new normal, but it took months of healing and learning how to work with a new part of her body created by the surgery in order to void her urine.

Had Karen's bladder cancer been caught in its earliest stage, it is possible she could have been treated without resorting to the complete removal of her bladder and urinary diversion. Karen says she encourages other women to "be their own health advocate. Research for yourself, know your options. Encourage your medical team to work with you as an individual, not as an illness."

New Research and Strategies Are Needed

When it comes to bladder cancer research, new strategies, ideas, and approaches are clearly needed to help understand and manage the disease in women on par with how well physicians and researchers in the United States understand and manage the disease in men.

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MEGAN WHINERY

Endometriosis Association

Endometriosis

Thank you for taking the time to read this submittal and seriously consider endometriosis as an area for research and improvement in the coming years. I am writing and speaking on behalf of both the Endometriosis Association and myself, as I have been living with this disease for an estimated 18 years. I have been fortunate enough to find a wonderful doctor, receive support through a dedicated organization and an understanding husband, and experience the miracle of motherhood in spite of my disease. But not every woman is this lucky, and I'm hoping that, one day, through events like these, we ALL can have these chances in life.

The Endometriosis Association was the first organization in the world created for those with endometriosis. As an independent self-help organization of women with endometriosis, doctors, and others interested in the disease, it is a recognized authority in its field whose goal is to work toward finding a cure for the disease as well as providing education, support, and research. I was fortunate enough to find them shortly after I was diagnosed, and was given the privilege to help others by organizing a local support group here in St. Louis.

The definition as posted on the Web site, http://www.pelvicpain.com, reads as follows: Endometriosis occurs when endometrial tissue, the tissue that lines the uterus and is shed during menstruation, grows outside of the uterus—on the ovaries, fallopian tubes, ligaments supporting the uterus, and other areas in the pelvic cavity. Endometriosis can also appear in a woman's bladder, bowel, vagina, or other places in her body. Like the lining of the uterus, these areas of endometrial tissue respond to the hormones of the menstrual cycle—they build up tissue each month, then break down and bleed during menstruation. But unlike the uterus lining, when these endometrial implants (also called growths or lesions) outside the uterus bleed, they can irritate a woman's body. It is estimated that 71–87 percent of women studied with chronic pelvic pain were found to have endometriosis. And, among infertile women, about 30–45 percent have this disease, making it one of the top three causes of infertility. Other symptoms include, but are certainly not limited to dysmenorrhea, pain before and during menstruation; dyspareunia, pain during and after sexual intercourse; and irregular vaginal bleeding.

To further complicate matters, the only way to diagnose endometriosis for sure is during a laparoscopy, which is a surgical procedure. This, in combination with a lack of information to the public, leads to long periods of misdiagnosis. According to a survey of 4,000 women with endometriosis posted on http://www.OBGYN.net, the average length of time to diagnosis is 9.28 years, allowing for a delay in the patient seeking help from a physician for an average of 4.67 years (this resulted mostly from women being under the age of 25 when symptoms began). Due to the lack of a "test," endometriosis accounts for approximately 25 percent of laparotomies performed by gynecologists. Among gynecologic disorders, endometriosis is surpassed in frequency only by leiomyomas (fibroids). There is also no cure for endometriosis, making the need for more than one surgery common in moderate to extreme cases.

This disease is not only physically but also mentally and emotionally exhausting due to the effects it has on all aspects of life. Unfortunately, women are not always taken seriously when trying to explain "pain" they feel during their menstrual cycle, and are often dismissed with a phrase similar to "welcome to womanhood." There was an article recently published about a woman named Claire Reynolds and her struggle with this disease. After talking to many women over the past several years in our support group, I found that this article expressed many of the same quotes uttered by most sufferers that I've encountered. I personally don't believe that any woman should have to say, "I just wish doctors had listened to me and spotted the severity of my case sooner. It would have saved (18) years of agony." And, as medical professionals, I don't think you ever want to hear anyone say, "I gave up going to doctors after a while as I felt stupid because they didn't believe me. But I knew there was something wrong." I can attest to the sentiment that, "When I woke up after the operation I said, 'I haven't felt this good since I was 13'." And, in conclusion, while I am honored that the

Endometriosis Association asked me to speak on their behalf, it really comes down to the fact that I just want other young girls to know about this so they don't have to go through the pain and suffering I did. Thank you to Claire for sharing her story to the world.

SUSAN WOOD, PH.D.

George Washington University School of Public Health and Health Services
Women's Health Research: Current and Future Implementation and Policy Implications

The research agenda and strategies for the next decade to be identified by the Office of Research on Women's Health at the National Institutes of Health (NIH) will be built through a series of national conferences starting first with this conference at Washington University in St. Louis, MO. The range of topics to be discussed at this conference reflects a sampling of the large number of health issues confronting women and the basic biomedical, behavioral, and clinical research needed to address them.

Women's health, as we know, requires a comprehensive, interdisciplinary, and lifespan approach to increase our understanding of girls' health, reproductive health, and the health of aging women of all races and ethnicities. Prevention, early detection, and appropriate and effective interventions and care all require an underlying base of evidence and knowledge that NIH is uniquely qualified to provide, through its own research or the research that it funds.

The NIH also faces challenges, when considering priorities and funding strategies, to work to ensure that the knowledge and information that is generated is available and useful to the public, to health professionals, to the larger scientific and medical communities, and to policy-makers. It is these policy implications and challenges that I would like to discuss. I will identify some of the key questions that need to be explored and addressed as the research strategy is developed.

Translation of research is one of these key challenges. Often called bringing research from bench to bedside, it is the ability to identify and move basic biological research findings to clinical utility. A second layer of translation involves moving clinically relevant findings into the appropriate level of widespread use. Both of these require successful interactions with other Federal health agencies, such as the Food and Drug Administration and Agency for Healthcare Research and Quality, and also with health professional and educational organizations. Evaluation of current successful mechanisms and application to women's health research can add to ongoing efforts.

Policy mechanisms for promoting interdisciplinary research are also critical. What do we know about what works in cross-disciplinary research? The NIH Roadmap for Medical Research has created mechanisms such as the Research Teams for the Future to promote interdisciplinary research. It is important to evaluate whether these mechanisms have been used for women's health research, and if, along with programs, such as the Building Interdisciplinary Research Careers in Women's Health scholars, they have led to increased interdisciplinary research

and findings. Lessons can be learned from these approaches for interdisciplinary research in women's health over the next decade.

A research agenda and strategy also has significant impacts on the workforce. Training programs and grants provide the foundation for the next generation of researchers and clinicians. Since part of the ORWH mission is to advance women in biomedical research careers, this fits well with the goals of the office. From another perspective, the knowledge and findings from NIH-sponsored research profoundly affect the direction of medical care and the medical workforce needs of the future. Understanding and evaluating the impact of the research agenda and priorities on the training needs and the next generation of providers will be important to attain success.

Effective communication of NIH research activities and findings on women's health both to the public and to policymakers is critical. The public understanding of both the promise and limitations of NIH-funded research requires proactive outreach and partnerships for success. Information provided by the NIH traditionally has targeted the scientific and medical professionals, with less information targeted at the general public or that reaches across cultural differences. Successful initiatives, such as through the National Cancer Institute and other institutes, and through ClinicalTrials.gov, has expanded direct access to information. However, reaching women facing health concerns in their daily lives and who don't actively seek NIH information requires expanding existing programs and developing new and innovative approaches and partnerships. Community organizations, health centers, and social networks, for example, can serve as the basis for information exchange and for health promotion. Communication of risks and benefits, as well as what is known and what yet remains to be learned through research, is key to empowering women to take what steps they can to improve their health and the health of their families.

Policymakers as well, at all levels, benefit from a fuller understanding of research needs, scientific and medical methodologies and findings, and strategies for bringing research to fruition to the benefit of the public. National, State, and local efforts to engage the policymaking community, including the many advocates for women's health research, provide opportunities to bring NIH expertise to the community and for NIH experts to learn of policymaker's priorities and community needs. The policy stakeholders include researchers, advocates, policymakers at all levels, relevant health agencies, scientific and health professional organizations, and community representatives.

As policymakers at the State and national levels potentially begin to address healthcare reform, issues of quality and comparative effectiveness research have moved to the fore. Research and the evidence base are central to these questions, and it is equally important that new data on sex and gender differences be available and analyzed appropriately. Ensuring women's health is addressed in healthcare reform is linked to continuing the research focus on women's health. Providing policymakers with relevant data and information on the NIH priorities in women's health research gives them the tools they can use for decisions in health policy.

The Institute of Medicine and the Government Accountability Office have issued a number of reports over the past two decades on women's health research and services, and on the broad issues of workforce, training, and translation and communication of research agendas and scientific findings. As the NIH Office of Research on Women's Health moves forward in developing the agenda and strategies for women's health research over the next decade, it should include a strong focus on these and other related policy implications throughout its development. I look forward to the series of national conferences as an opportunity to highlight the potential policy issues, approaches, and strategies that can promote the health of all women across the lifespan.

DIANA HANKEY UNDERWOOD, M.S., WHNP-BC

Grace Anatomy, Inc.

Childbirth Classes Changed Women's Health Care in the Delivery Room All Over America—Now We Need Incontinence Classes To Improve Care in the Outpatient Setting

Good afternoon. My name is Diana Hankey Underwood. I am a Nurse Practitioner in Women's Health and am currently the Director of Grace Anatomy, Inc., a nonprofit organization involved in local, national, and international work in healthcare issues involving incontinence. Other incontinence problems, related birth defects, and their associated psychological distresses are other areas that Grace Anatomy, Inc., is resolutely dedicated to improving. We are involved in teaching; researching; and sharing resources, experiences, and ideas among people who have and/or who treat these conditions. This work led to two national awards in 2007. I was awarded the Nurse Practitioners in Women's Heath (NPWH) and Bayer HealthCare Inspirations in Women's Health Award. I received another award titled, "Continence Care Champion 2007" from the National Association for Continence (NAFC), which was sponsored by the American Urogynecologic Society (AUGS) Foundation.

I had the privilege of training under Dr. Carolenn Sampselle, a great researcher on the relationship of childbearing to incontinence, and an organized woman of immense compassion. Another mentor of mine was one of the first women in the United States to teach childbirth classes. The stories I heard from her of the really inhumane treatment of women, even by reputable doctors, helped me when I later suffered from similar treatment in a gynecology clinic. At one time, it was common for women to have their hands slapped and tied down, and for them to be gassed unconscious, with or without their consent. Midline episiotomies were the standard. Any given woman who complained was labeled and treated quite badly. Many doctors resisted those first childbirth classes, stating that teaching patients would only confuse them. Of course, today, treating a woman in a labor room in such a manner is completely unacceptable. These practices began to change only when public education became available. Unfortunately, the current "standard of care" for patients in the gynecology and urology clinics is, in my opinion, often just as inappropriate. Today, women are not provided with accurate information and I often hear that teaching them about their urinary system and pelvic floor would just confuse them.

My own experience is an example of how punishing our medical system can be to women who "complain." My experience with bladder problems began with surgery to stop hemorrhaging from my trigone when I was 17. By the time I started my graduate studies in my early 30s, I was an expert at concealing and controlling leaking blood and urine. I would not have listed this as a great stressor in my life; any more than having to dye the gray out of my hair is now—a bit of an expense, a bit of a hassle, but nothing that shakes the ground under your feet.

That changed when I started infertility treatments at a leading institution and had a pregnancy confirmed by ultrasound at 5 weeks. Everything was fine while I took the name-brand progesterone, but when the pharmacist switched me to a generic, I knew something wasn't the same and I asked the nurse to let me see the doctor. I was told that I was being ridiculous; we all know generics are as good as name brands and I was not "allowed" to see the doctor. (This drug lot was later recalled due to faulty manufacturing, and the company generously offered to reimburse my five dollar copay.) I was finally seen by a friend and an ultrasound was done. My husband and the technician and I watched my baby die on the screen right in front of our eyes. After a horrible D & C in which I hemorrhaged profusely, the doctors were forced to leave a catheter in my uterus as a tampon aid. Unfortunately, this left me with a non-functioning bladder and the need to self-catheterize, mild fecal incontinence, a mass in my labia that grew quite large before passing any solid stool, and an endometrial mass in my cervix that started to create the sensation of being in labor. This pain grew more and more intense over the following months, interfering with my daily activities and my sleeping.

We brought a baby home from overseas. I couldn't wear paper products because they scratched this tender tissue, so I wore his cloth diapers and cried. Keeping my brain constantly on maximum concentration and overload was the only way I could shut out the pain, so when our baby began to walk, I began to manage a clinic for the uninsured. While waiting to see a top pelvic floor specialist, I was forced to become very creative, wearing a tampon in my rear and several layers of cloth diapering and girdling. At my first appointment, I was given a questionnaire that began with a picture of man's body (no genitals) with a request to show where I hurt. I was asked, "How often do you use your digits to evacuate your rectum." I thought "about as often as you pick your nose, i.e., 'use your digits to evacuate your nostrils'." I had no idea why they would ask me such an off-the-wall and vulgar question out of the blue. They could not have made the appointment more humiliating or frustrating if they had tried.

Later, when I told them that I was sure I had parasites, I was laughed at. When I insisted they test me, I was given a lot of grief. (They had ordered and my insurance paid for three MRIs, but a parasite test would be a "waste of money"). My first stool sample was lost. The second one was '"mishandled." I was getting worse in every way. My spirits and my cholesterol continued to drop. I took my husband to an appointment and when I told the top surgeon that I was pretty sure that besides parasites, there was something wrong with my levator muscle and that I had a mass "right there." He pushed his finger into my vulva, into this excruciating area that would swell out. He raised his voice and stated, "That is NOT your levator muscle! That is your vulva!" He asked no other questions about fecal incontinence.

My husband was as incensed as I was. He suggested I take a picture of it when it bulged out and then show someone in Risk Management so that they would tell the doctor to change his manners. After quite a bit of battle, I was told to sue and go away. “No one else wants to see you and get their name added to a law suit.” I told them I didn’t believe in suing and that I wanted them to live up to the advertisements they do about providing excellence in care for women.

I had a hysterectomy, which finally helped stop the constant horrible, labor-like pain that had lasted day and night for almost 2 years. When I was told the pathology was normal, I called a head pathologist, whom I knew from a cancer research project I had previously worked on. I asked to see my slides, because I KNEW I had a mass in my cervix. The nurse called me from the gynecology clinic and told me, “you cannot come back for your two-week post-op appointment. The doctors were all talking and they said they never wanted to see you again as long as they lived.” I guess their theory was that if you are going to get sued anyhow, you might as well enjoy the licks that you can get in first. (Later, the pathologist apologized as he showed me the slides, stating that they were “completely misread and clearly are full of endometriosis.”)

I still had the incontinence, but after the hysterectomy, I began to smell worse and worse. It was so humiliating and distressing, and only the pelvic floor physical therapist gave me any tools to make it bearable. So much time and suffering had gone by. Then one day, my sweet little boy woke up, suddenly unable to walk, and could only flop around. He was hospitalized and we were both finally treated for Giardia, a very contagious parasite and a B12 deficiency. We were treated with five dollars worth of metronidazole and twenty dollars worth of B12. Within 3 weeks of getting appropriate care, I was dramatically better. (My son was not so fortunate and has spent years in occupational and physical therapy.)

One of my really faithful friends continued to encourage me with stories of women she had known and where they had gotten the fire to fight for childbirth classes. Their stories echoed the same ingredients that provided fuel and stoked the fire for change that ultimately brought conferences such as this very one into existence. These common features exist today: well-educated, yet ignorant, women like me; indecent treatment; arrogance on the part of many leaders; their often cruel beliefs that women with a lot of physical problems deserve them; an arrogant belief that women could not understand; and that any woman who doesn’t go with the flow and obey and revere the doctors deserves to be put in her place.

Just after my son was released from the hospital, I received a call that changed my life. A friend in another country had called to ask if I could help some really dedicated surgeons work in the United States with one “Dr. Alberto Pena.” She said she couldn’t explain why, but that it was imperative that I find him—could I please just find him! So I did. When you complain you have no shoes, God shows you those who have no feet. Dr. Pena is a doctor who specialized in fecal incontinence in children. I later found out that five orphans had tried to commit suicide after unsuccessful attempts to repair birth defects that left them with fecal incontinence and emotional scars. The doctors were hoping to learn how to do a better job of understanding the pelvic floor and doing repairs in the most effective manner. I met with the surgeons from overseas and with the staff at Cincinnati Children’s Hospital and I was so surprised by how many things we could be doing for women that we aren’t, and how many things we do for women that we could

do for children that we aren't. Already from this work, one paper has been published on a completely new repair protocol that combines Russian/United States protocols and has resulted in success in five out of seven cases, where previously no one in either country had ever had success.[1] I am hopeful that we can work with them on tissue histopathology, because understanding these birth defects may lead us to a better understanding of why two women can both go through horrendous deliveries, but one ends up with fistulas and the other doesn't.

With a move to New York and the encouragement from my mentor and also from Cheryle Gartley and Jasmine Schmitt from the Simon Foundation for Continence, I spent 1 year researching and adapting their course on incontinence. Working as adjunct faculty at the State University of New York in Buffalo, I began to teach about how to cope, about the most common causes of incontinence, and about what we can do to treat it. I created an elimination diary that adds a lot of dignity and understanding to this vital part of the care. I taught patients how to use it to communicate clearly with their providers, something that I was very bad at, but that I learned a lot about, albeit, sadly too late. I hope others will look at it here today. This program was extremely well received; it helped many people and eventually became the first incontinence program in the United States to receive insurance reimbursement. I am in the process right now of getting the entire lecture series posted to an Internet site. I am also working on a research project, reviewing how women do after pelvic floor mesh insertion. I could write several more paragraphs about the almost obscene things I have seen and heard in the last few years, but most of this could have been eliminated by educated patients and a provider willing to give them the right to be involved in their own care.

To change the outcomes and costs of bladder and pelvic floor disorders affecting women's care right now, we have to invest in independent patient education courses. I hope you will consider grants that would allow the Wound, Ostomy, and Continence Nurses Society; National Association for Continence; Simon Foundation; International Foundation for Functional Gastrointestinal Disorders; and Women's Health Foundation and Grace Anatomy, Inc. to test classes and other public awareness and education programs. Let us teach the public and the nurses and compare which courses are best for which specific populations. Each of our programs has a little different angle, but in the end, I believe these differences are like childbirth methods proposed by Dick-Reed, Lamaze, and Bradley. It took more than one kind of class, and many leaders, but the fact that women began to understand the process changed the face of women's health care in America.

Each of our organizations, individually, and collectively, need to have funding to do public education, paid for initially from Federal funds, not from grants provided by drug companies. Grace Anatomy has the ability to provide classes that appeal to groups who want to hear straight talk that they can identify with. Please give us the opportunity to demonstrate what a life-changing difference it can make and to see how much money can be saved by teaching men and women what they need to know. Thank you for your consideration.

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NANCY NORTON

International Foundation for Functional Gastrointestinal Disorders

Impact of Fecal and Urinary Incontinence on Health Consumers

About the International Foundation for Functional Gastrointestinal Disorders

The International Foundation for Functional Gastrointestinal Disorders (IFFGD) is a nonprofit education and research organization dedicated to informing, assisting, and supporting people affected by gastrointestinal or motility disorders and fecal incontinence. The largest organization of its kind in the United States, IFFGD has been working with patients, families, physicians, practitioners, researchers, employers, regulators, and others to broaden understanding about gastrointestinal (GI) disorders. We work closely with healthcare professionals and the medical and pharmaceutical industries. This cooperative effort places IFFGD at the forefront of functional GI and motility disorders care and research, helping us to aid and benefit those affected.

We work with an international group of experts from multiple disciplines who serve on our medical advisory board. We provide a link between clinical research and patient care. Working together, we help ensure that clinical advancements concerning GI disorders result in improvements in the quality of life of those affected.

Introduction

The impact of living life as a person with incontinence carries a burden, whether it is urinary incontinence, fecal incontinence, or both. The nature of the condition, one that few feel comfortable even mentioning, presents unusual challenges. There is a tendency to believe that bowel incontinence affects only the frail and elderly. But while it is the primary cause of nursing home admissions, incontinence affects all ages, children and adults alike. For example, women may develop bowel incontinence as a result of a vaginal delivery. Incontinence is also associated with spinal cord injuries, multiple sclerosis, diabetes, colon cancer, prostate cancer, uterine cancer, and a host of other digestive diseases.

The prevalence of fecal incontinence in women living in the community increases with age, from 6 percent in those younger than 40 years to 15 percent in older women. In nursing homes, the overall prevalence of fecal incontinence is about 45 percent, with a rate as low as 10–15 percent in more independent residents and up to 70 percent in the most dependent. Prevalence of urinary incontinence in women living in the community also increases with age, from 19 percent at age younger than 45 years, to 29 percent in age 80 years or older. In nursing homes, the prevalence of urinary incontinence is much higher than that in the community: rates are 60–78 percent in women.

Challenges Patients Face

Incontinence is a chronic condition with often unpredictable symptom episodes. Uncertainty, it has been said, is the worst illness.[1] The effects of persistent uncertainty surrounding onset of an episode of incontinence can be disabling. There is no socially acceptable way to talk about toilet habits or bodily waste. Thus, a social stigma is attached to the symptoms of incontinence, and by attribution, to the sufferer.

For the patient who seeks treatment, effective therapies are often elusive. Moreover, symptoms of chronic illness place demands on families as well as patients. They impair functioning while placing continual demands on the individual patient.[2]

The impact of having a chronic illness may be subjective and it may change within each individual over time. A variety of external and internal factors intersect, influencing whether or not a person will seek medical help, and their ability to adapt to their illness demands and benefit from treatment. This personal impact is influenced by cultural, social, and psychological factors along with concepts of self-image, self-worth, and health expectations.[3]

It has only been in the past 20 years that we have gained a better understanding of the impact of urinary incontinence on the psychosocial well-being of affected individuals. The emergence of new tools for assessment of quality of life with urinary incontinence has changed the way this condition is viewed and managed.[3] The same assessment needs to be made for fecal incontinence.

Neither urinary incontinence nor fecal incontinence is a single disease. Rather, they are symptoms of many different conditions. Patients come to it from many perspectives with different expectations.

Until recently, the focus for establishing a diagnosis and assessing a therapeutic outcome of urinary incontinence has been on the objective measurement of urinary loss. Fecal incontinence has been measured in similar ways looking at frequency, amount, composition, and the circumstances surrounding fecal leakage.[4] However, objective measurements, such as weight of urinary incontinence pads or frequency of fecal incontinence episodes, are not always practical, nor do they describe the true impact of incontinence on the patient.[3] As better tools emerge, we will capture a more comprehensive and truer picture of the impact of incontinence and the burden it represents to the individual.

Taboos and Stigmatization

The person with incontinence is faced with a persistent challenge of overcoming social and cultural taboos. Socially, it is expected that we acquire bladder and bowel control skills during childhood. We are taught cultural norms about when and where to eliminate and dispose of bodily wastes. We react generally with disgust to the presence of bodily waste, particularly feces. Possibly this is a basic human emotion to protect us from disease. In any event, the loss of urine or feces, particularly as an adult, carries significant societal taboos.[5]

When bladder or bowel control is lost, especially in public, overwhelming feelings of shame and embarrassment often result. This loss of control over elimination and public humiliation represents major threats to self-esteem.[5]

Individuals who suffer incontinence will go to great lengths to keep their condition a secret if they are able. Revelation of this secret can have a profound affect on their well-being. They may be subjected to gossip, hostility, and other forms of social exclusion. The elderly are frequently relocated to other living arrangements and are at risk for institutionalization.[6] Anal

incontinence may be one of the most common reasons for social isolation and institutionalization of the elderly. Incontinent patients have been reported to be less likely to marry and hold a normal job. In the workplace, in addition to lost productivity, individuals face stigmatization and reduced self-esteem.[7]

With incontinence, the illness experience is not limited to the symptoms. It is accompanied by what is called a "second illness"—the reactions of the social environment and the stigma associated with the disorder. Stigmatization is a dimension of suffering added to the illness experience, and has been found to lead to social isolation, limited life chances, and delayed help-seeking.[8]

Barriers to Seeking Help

Almost every article published on incontinence makes some kind of reference to the strong, if not devastating, impact of having the disorder. Yet 50 percent to 70 percent of incontinent persons do not seek help for their condition.[3,4,5,9,10]

Physicians Don't Ask/Patients Don't Tell. A study of primary care physicians found that the majority of these physicians asked only 25 percent or fewer of their patients about incontinence.[3] But significantly, while up to 70 percent of incontinent patients did not voluntarily report the problem, more than 75 percent did report the condition when asked about it by their physician.[3]

Because patients are often reluctant to introduce the topic, physicians need to take the lead. They need to ask their patients about bowel and bladder function, about the patient's ability to control it, and whether it's resulting in changes in daily routine.

Severity of symptoms may be a driving factor that brings people to the physician because they are no longer able to cope with the symptoms. But incontinent people have a need to perceive the benefits of treatment in order to overcome the emotional costs they will expend in revealing their incontinence to a physician.[9] For some patients, there is a fear that they won't be able to even get to the doctor's office for an appointment without being incontinent. Others have sought help in the past, but were met with a lack of interest, or they may have tried various treatments with no success and are therefore reluctant to pursue another course of treatment.

Breaking Down Barriers

How can we break down these barriers in order to reach patients and improve the standards of prevention and care? We can begin by speaking up, by educating, by affirming, and by reaching out openly to those who are at risk or who are affected. The magnitude of the prevalence and burden of incontinence has been masked in this country by silence for far too long.

The 2007 National Institutes of Health State of the Science Conference made recommendations for prevention of incontinence. However, fecal and urinary incontinence are associated with a range of risk factors. In most instances, the pathways are complex, involve multiple factors, and are not well understood. Overall, the evidence is insufficient to recommend preventative interventions, except for a few specific risk areas. Organized approaches to improving clinical detection of fecal and urinary incontinence are needed and require rigorous

evaluation. There is good evidence that some risks for developing fecal and urinary incontinence can be modified and reduced. Routine episiotomy is the most easily preventable risk factor for fecal incontinence. Pelvic floor muscle training and biofeedback are effective in preventing and reversing fecal and urinary incontinence in some women during the first year after giving birth.

Efforts to raise public awareness about incontinence and the benefits of prevention and management should also aim to eliminate stigma, promote self-disclosure and care-seeking, and reduce suffering.

To reduce the suffering and burden of fecal and urinary incontinence, research is needed to—

- Establish underlying mechanisms
- Describe a classification system
- Determine natural history
- Classify persons according to their future risk for incontinence
- Design interventions targeted to specific population groups
- Determine the effects of these interventions
- Guide policy

Conclusion

We believe there is more that can be done on all fronts to not only aid in preventing incontinence, but to also improve the awareness around it; to make it easier for people to seek help; and find solutions to managing the condition, if not resolving it.

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MADELINE NOLAN

LAM Foundation

LAM—A Very Gender-Specific Disease That Strikes Young Women

As a patient with lymphangioleiomyomatosis, LAM for short, I have had the privilege to participate in a research protocol under the direction of Dr. Joel Moss at the National Institutes of Health (NIH).

LAM is a rare lung disease that affects women. LAM is the only disease that is very gender-specific that is not related to reproductive systems of males or females. Both genders have lungs, kidneys, and lymph systems that are the targets for LAM. Yet it is women who manifest this devastating disease. Therefore, this makes LAM quite scientifically interesting.

Progress in understanding LAM has come a long way in just the short time since Sue Byrnes established The LAM Foundation in 1995 and the NIH protocol began. There was no research being done before this time. While researchers have made exciting discoveries, there is yet to be a treatment or cure. One of the greatest challenges is identifying patients. LAM is often misdiagnosed as asthma or emphysema for years. There needs to be more awareness among healthcare providers about this disease that affects women before women are in the severe stages of LAM and their lungs are destroyed; they need to be diagnosed.

In the past several years, funding at the NIH was reduced for LAM research. As scientists are getting closer to finding possible treatments, the momentum cannot be allowed to slow down. Women with LAM and those yet to be diagnosed need this continued support for research.

Please visit http://www.thelamfoundation.org to learn more about LAM. There are many published research articles, as well. Hopefully, with continued scientific research, there will be many more in the near future. Thank you for your consideration.

LYNNE MATALLANA

National Fibromyalgia Association

Fibromyalgia: A "Real" Chronic Pain Condition

In 1997, while in my pink bathrobe and from my bed, I cofounded the National Fibromyalgia Association (NFA), a nonprofit organization headquartered in Orange County, CA, which develops and executes programs dedicated to improving the quality of life for people affected by fibromyalgia. The organization advocates for more than 10 million Americans afflicted with fibromyalgia who individually have not had a voice loud enough to be heard by the National Institutes of Health or the medical community. The NFA focuses on patient support and education, awareness outreach, healthcare provider education, patient advocacy, and the facilitation of scientific research. By providing an array of services, the NFA has helped advance the understanding of this chronic pain disorder and has assisted people affected by fibromyalgia in developing skills to regain control of their lives, reduce isolation, and restore hope.

To carry out its mission, the NFA collaborates with and relies on a number of individuals and organizations. In addition to staff members, the NFA is assisted by volunteers; support group leaders; partnering nonprofit organizations; sponsors; its board of directors; and more than 65 fibromyalgia research experts who serve on the NFA's advisory boards, committees, and "Circle of Care" collaboration.

Although this chronic widespread pain condition was christened with the name fibromyalgia syndrome in the mid-1980s, it has been around for centuries. Our grandmothers were probably told they had rheumatism and Elizabeth Barrett Browning was thought to suffer from the "vapors," but their symptoms all point to fibromyalgia. In 1981, a pivotal paper, *Primary Fibromyalgia*, by Dr. Muhammad Yunus, was published and a new era of scientific study began. There was no research money available at that time, so researchers often funneled leftover funds from other projects into small, often single-blinded investigations and the science of fibromyalgia was finally instigated. In the beginning, because of small participant numbers and limited study designs, the researchers and their work were chastised by their peers for being beneath most scientific standards. However, researchers continued to push forward. In 1993, there were approximately 200 published fibromyalgia studies. Today, there are more than 4,500. Despite these strides, the scientific journey for fibromyalgia has been bumpy and arduous. Research is still lacking, funding is almost nonexistent, and scientific interest in fibromyalgia is low.

However, more than 10 million Americans, approximately 80 to 90 percent of them women, have fibromyalgia. More than one-third of patients seen in rheumatology offices have fibromyalgia and patients' annual visits to healthcare professionals are frequent. The amount of National Institutes of Health (NIH) money allocated to fibromyalgia is deplorable. In 2005, inflammatory bowel disease was granted $61 million by NIH for research. That same year, the NIH awarded $21 million for interstitial cystitis research, an illness that affects just over 1 million Americans. Lupus, with an estimated American patient population of between 1.5 and 2 million people, was granted $99 million. All of these illnesses are comorbid conditions of fibromyal-

gia and yet the National Institutes of Health granted only $10 million that year to fibromyalgia research. This is a travesty.

In 2002, NIH sponsored the Fibromyalgia Program Assessment meeting in Virginia. NIH provided funding for fibromyalgia researchers and patient advocates to meet and discuss the state of fibromyalgia science and what the next steps should be in expanding scientific investigations. Many institutes were represented and varying research areas were scrutinized, including pain and pain processing; HPA axis and autonomic nervous system function; epidemiology; risks; psychosocial issues; and overlap syndromes and intervention research. To date, fibromyalgia has not received an increase in annual NIH funding and most of the research ideas and future directions generated from that meeting have never come to fruition or have been shelved.

The procrastination and neglect by the National Institutes of Health in addressing the need for more and better fibromyalgia science is helping to propagate a negative view of not only the illness, but also the patients. The quality of life for patients with fibromyalgia is more negatively affected than those with lung disease, insulin-dependent diabetes, rheumatoid arthritis, and osteoarthritis, and yet FM patients are relegated to being viewed as whiny, lazy, complaining, women undeserving of their doctors' time and scientific research.

Because of the dedication of university researchers who relied on funding from nonprofit bingo games, individual donations, and small fibromyalgia nonprofits to do FM research, science is proving the existence of this disorder as indicated by frequent new discoveries. Several different imaging techniques, including functional MRIs and SPECT scans, are revealing subtle, but important, changes in the brains of FM patients in response to a pain stimulus compared to healthy subjects. Neurochemical abnormalities, including lower than normal levels of dopamine and serotonin and higher levels of substance P have become evident. Three medications approved by the U.S. Food and Drug Administration—pregabalin, duloxetine, and milnaciprin—are making a positive impact on FM symptoms in some patients. And yet the public and the medical community are still questioning fibromyalgia's validity.

Even now with more than 4,500 published scientific studies, the question of fibromyalgia as a viable medical disorder is in doubt. The headline of a January 14, 2008, *New York Times* article read, "Drug Approved. Is Disease Real?" On February 8, 2009, an Associated Press (AP) article created to debunk pharmaceutical companies' marketing tactics took aim at patients suffering with a chronic pain condition that has been in existence for centuries and once again made the statement, "whether it's a real disease at all." Even Fred Wolf, the lead researcher from the 1990 American College of Rheumatology Fibromyalgia Diagnostic Criteria study, is quoted in the *New York Times* article as having doubts: "Some of us in those days thought that we had actually identified a disease, which it clearly is not. To make people ill, to give them an illness, was the wrong thing."

Through the media's questioning of pharmaceutical company motives, it is the patient who suffers. They continue to be stigmatized when journalists quote people such as Dr. Norton Hadler in the AP article who said "that telling people they have fibromyalgia can actually doom them to a life of suffering by reinforcing the idea that they have an incurable disease."

The idea perpetuated in both of these articles is that the pharmaceutical companies made up a disease to sell drugs. So now even when help is available for some patients, rights granted to most ill people regarding access to FDA-approved medications are being denied. At the conclusion of the AP article, Dr. Dan Clauw stated, "At the end of the day, I don't care how you categorize this—it's a legitimate condition and these people are suffering." Shouldn't that be the real message both to scientists and to the medical community?

Scientific studies are needed to raise the credibility barrier that exists in the medical community. Because studies haven't proven the exact cause of fibromyalgia or generated clinical diagnosis techniques, the disorder is still not taught in medical schools and many doctors still do not recognize or diagnose the condition. In a recent survey, 90 percent of physicians agree there is a need for more physician-oriented information and 82 percent of physicians agree that FM is difficult to treat with currently available tools.

Without earlier diagnosis, better treatment options, and more recognition, the financial burden generated by FM will continue to escalate:

- Fibromyalgia costs the United States $12–$14 billion each year.
- A survey of the work and disability status of 1,668 FM patients reported that 25 percent had received disability payments.
- Total healthcare costs over 12 months are about three times higher among fibromyalgia patients compared to patients without any healthcare encounter with FM.
- Failure to diagnose a true case of fibromyalgia has its own costs, largely in excess general-practitioner visits, investigations, and prescription costs.
- Use of complementary and alternative medicine is 1½ times higher in FM patients.

The National Fibromyalgia Association holds the National Institutes of Health at least partially responsible for the negative attitudes that exist concerning fibromyalgia and the patients it afflicts. Bench science and clinical science must be instigated to help unlock the mysteries of this chronic pain condition that affects so many lives. To that end, the National Fibromyalgia Association, working with a lobbyist, was able to submit and get the following 2009 Congressional Language approved:

National Institute of Arthritis and Musculoskeletal and Skin Disorders

The committee is deeply concerned regarding the lack of a sustained commitment to fibromyalgia-specific research at the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) and encourages a much greater emphasis on fibromyalgia at the Institute. Therefore, the committee urges NIAMS to convene an international symposium to elucidate the "state of the science" with regard to fibromyalgia and to publish a consensus document within 1 year establishing a roadmap for future fibromyalgia research. The Committee urges NIAMS to establish a funded Center with dedicated staffing to serve as a nexus for research on fibromyalgia and related disorders that will explore the broad spectrum of neurotransmitter abnormalities and other potential problems, including sleep disturbances, abnormal cervical anatomy, and genetic factors, which might contribute to symptom development and expression.

In addition, the Committee encourages NIAMS to support basic research into animal models of the disease. The Committee also encourages NIAMS to collaborate with the NIDDK in support of its Multi-disciplinary Approach to the Study of Chronic Pelvic Pain (MAPP) initiative.

National Institute of Neurological Disorders and Stroke

Whereas fibromyalgia has traditionally been considered a musculoskeletal disorder, the committee acknowledges that substantial evidence implicates pathology within the central nervous system in the development and expression of fibromyalgia symptoms, including abnormal brain activity, abnormal concentrations of a variety of neurochemicals in cerebrospinal fluid, dysautonomia, and neuroendocrine dysfunction. The Committee, therefore, urges the National Institute of Neurological Disorders and Stroke (NINDS) to collaborate with the NIAMS in convening an international symposium to elucidate the "state of the science" with regard to fibromyalgia, and publish a consensus document within 1 year establishing a roadmap for future fibromyalgia research. The Committee urges NINDS to foster and conduct fibromyalgia-specific intramural research related to the cause, prevention, and treatment of the disorder through funding and by making available resources related to this pursuit. The Committee encourages NINDS to support basic research into animal models of the disorder.

An NIH-funded fibromyalgia research center would go a long way to raise not only the credibility of fibromyalgia to the public, but also to new scientists interested in researching a "real," viable, and complicated illness. Young researchers with original and innovative ideas are needed to help unravel the scientific mysteries of fibromyalgia. An international researchers' conference is timely, especially with all of the innovative fibromyalgia research that is being published by scientists from all over the world. The NIH can make both of these requests come to fruition and help open doors to better fibromyalgia science and understanding.

The National Fibromyalgia Association is grateful to be represented at this meeting. It is both timely and expedient that fibromyalgia is included in discussions about chronic pain and discrepancies in women's scientific research. Dialogue is appreciated, but action is needed by the National Institutes of Health to elevate fibromyalgia on the medical and scientific ladder to the level it deserves. It is time that fibromyalgia is recognized as a devastating illness that impacts not only the quality of life of its victims but also their families, employers, and friends.

CHRISTIN VEASLEY

National Vulvodynia Association

The Need for an Expanded Research Effort on Vulvodynia—A Prevalent and Neglected Gynecological Pain Disorder

Vulvodynia, a chronic pain condition affecting up to 16 percent of American women, is plagued by misunderstanding, misdiagnosis, ineffective and inappropriate treatment, as well as a lack of scientific research. Since FY 1998, the United States Congress has repeatedly called upon the National Institutes of Health (NIH) to expand Federal research efforts on vulvodynia. To date, the NIH has supported a mere total of 12 applications totaling $11,015,227, or

approximately $1 million per fiscal year. The FY 2009 NIH Appropriations Report contained the following language on vulvodynia:

Vulvodynia

For the 12th consecutive year, the Committee has called on the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) to expand research efforts on vulvodynia, yet only 11 total awards have been made to date and only 3 in the past 3 fiscal years. This is especially discouraging, given that in 2006, results from a ground-breaking NICHD-funded study were published showing that up to 16 percent of American women suffer from Vulvodynia, 60 percent consult at least three providers in search of a diagnosis, and 40 percent of them remain undiagnosed. The Committee strongly urges the NICHD to substantially increase the number of awards for vulvodynia studies in fiscal year 2009, with a particular emphasis on etiology and multicenter therapeutic trials. In addition, to ensure that experts in vulvodynia, related chronic pain, and female reproductive system conditions are adequately represented on peer review panels, the Committee recommends that the current program announcement, PA-07-182, Vulvodynia—Systematic, Epidemiologic, Etiologic or Therapeutic Studies, be reissued with "special review." Finally, the Committee calls on NICHD to employ the full range of award mechanisms available to expand research and research capacity in this area.

The following testimony summarizes vulvodynia's impact on the physical and emotional well-being of millions of American women and provides research recommendations for the Office of Research on Women's Health's (ORWH's) consideration in planning the next decade of women's health research at the NIH.

Vulvodynia Defined

Vulvodynia, as defined by the International Society for the Study of Vulvovaginal Disease, is "vulvar discomfort, most often described as burning pain, occurring in the absence of relevant visible findings or a specific, clinically identifiable, neurologic disorder."[1] Although burning is the most commonly reported symptom, many women also describe the pain as scalding, searing, lacerating, raw, and stabbing.[2] The condition varies in persistence and location. The pain may be constant or intermittent, localized or diffuse. The two main subtypes of vulvodynia, which may coexist, are provoked vestibulodynia (i.e., vulvar vestibulitis syndrome) and generalized vulvodynia. Provoked vestibulodynia (PVD) refers to pain experienced primarily when pressure is applied to the vulvar vestibule; this pain typically occurs with sexual intercourse, tampon insertion, a gynecological exam, or simply sitting. Pain patterns in women with generalized vulvodynia are highly individualized since they can experience pain anywhere within the distribution of the pudendal nerve. The pain is typically unprovoked, but also worsens with pressure on the vulva.

Prevalence and Risk Factors

According to an NIH-funded study conducted at Harvard Medical School, approximately 16 percent of American women between 18 and 64 years of age report suffering from chronic vulvar pain at some point in their lives, with more than 90 percent reporting ongoing pain for many years. Approximately 6 million women currently suffer with chronic vulvar pain.[3] Two studies, including the above Harvard study, have demonstrated that the incidence of symptom

onset is highest between the ages of 18 and 25.[3,4] Once considered to be a condition affecting primarily Caucasian women, recent studies have shown that African-American and Hispanic women are just as likely to develop vulvodynia.[3,5,6]

To date, there has been very little research on risk factors associated with the development of vulvodynia. Preliminary results suggest that there may be multiple risk factors involved, including vulvovaginal infection and oral contraceptive use, particularly at an early age.[7,8,9,10,11] Other studies have implicated the following risk factors: early age of first intercourse, early age of menarche, history of childhood nocturnal enuresis, and difficulty or severe pain with first tampon use.[3,12,13,14,15]

Misdiagnosis

Although vulvodynia was first documented in medical texts in 1880, the medical community did not start seriously addressing the condition until the 1970s. Because vulvodynia is rarely covered in medical school curricula and residency programs in the United States, and its symptoms mimic those of common vulvovaginal infections, women are routinely misdiagnosed. The above NIH-funded Harvard prevalence study found that nearly 60 percent of patients reported visiting three or more healthcare providers to obtain a diagnosis and 40 percent remained undiagnosed, even after this many consultations.[3]

Burden of Illness

Living with vulvodynia imposes serious limitations on a woman's ability to engage in normal daily activities. In many cases, the pain is so severe and unremitting that it forces women to resign from career positions; abstain completely from sexual relations; and limit many physical activities, often destroying a woman's self-image. In addition, because genital disorders are not openly discussed, women with vulvodynia experience shame, isolation, and hopelessness. According to an NIH-funded study conducted at Robert Wood Johnson Medical School, 75 percent of women with vulvodynia feel "out of control" of their bodies, 60 percent report that it compromises their ability to enjoy life, and 60 percent cannot have sexual intercourse because of the pain.[16]

Comorbid Conditions

Some women with vulvodynia report suffering from multiple conditions, including endometriosis, interstitial cystitis, temporomandibular joint and muscle disorders, migraine headache, fibromyalgia, irritable bowel syndrome, low back pain, multiple chemical sensitivities, allergies, and chronic fatigue syndrome; however, there has been little scientific research on the overlap of these conditions. Interstitial cystitis (IC) has been the focus of the majority of published studies. The reported percentage of women who have both IC and vulvodynia varies widely, from 12 to 68 percent, depending on the study.[17,18] Similar findings have been reported for women with vulvodynia and irritable bowel syndrome or fibromyalgia. A recent NIH-funded study conducted at Robert Wood Johnson Medical School found that women with vulvodynia were 3.1 and 3.8 times more likely to have either a comorbid diagnosis of irritable bowel syndrome or fibromyalgia, respectively.[8] Another recent NIH-funded study, conducted at the University of North Carolina, found that 78 percent of 137 women with provoked vestibulodynia had either clinical or subclinical orofacial pain. Upon formal evaluation by an orofacial

pain specialist, the majority of patients exhibited signs and symptoms highly suggestive of temporomandibular joint and muscle disorders.[19] Although preliminary, these findings warrant additional substantive research into this area.

Etiology

With modest financial support from the National Vulvodynia Association, a number of pilot studies investigating the etiological mechanisms of PVD have been conducted. Although the pathophysiology of PVD remains inconclusive, multiple factors have been associated with the initiation and/or perpetuation of symptoms. Recent tissue studies have found that women with PVD, as compared to controls, exhibit 1) vestibular nerve fiber proliferation; 2) elevated levels of inflammatory cytokines IL-1beta and TNF-alpha in vestibular tissue; 3) increased levels of IL-1-beta, IL-6, and IL-8 in vestibular fibroblasts, both at baseline and following in vitro stimulation with Candida albicans; 4) increased vanilloid receptor (VR1) expression in vestibular tissue; 5) decreased estrogen receptor alpha expression in vestibular tissue; 6) increased blood flow and erythema in the posterior vestibule; and 7) an increase in inflammatory infiltrate, number of mast cells, and degranulated mast cells in vestibular tissue.[20,21,22,23,24,25,26]

Studies have also shown that subsets of women with PVD have polymorphisms in the following genes: IL-1ra, IL-1beta, mannose-binding lectin, and melanocortin-1 receptor.[27,28,29,30]

Studies of central sensitization in PVD patients have demonstrated increased pressure sensitivity in both the vulva and peripheral body regions; increased pain intensity and unpleasantness in response to tender-point examination at nine nongenital sites; higher levels of brain activity in primary and secondary somatosensory cortices and insular cortex during application of pressure to the posterior vestibule; enhancement of post-capsaicin pain response extending far beyond the anatomic location of the primary complaint; and lower pain pressure thresholds to noxious cold stimulation, suggesting a systemic hypersensitivity. Pelvic floor muscle pathology has also been implicated in some women.[31,32,33,34,35]

There is a scarcity of research on the pathophysiology of generalized vulvodynia. The prevailing theory is that it exhibits the characteristics of a neuropathic pain syndrome with elements of central sensitization.[31]

Treatment

Because of a lack of research on treatment efficacy, evidence-based treatment guidelines for vulvodynia do not exist. Consequently, once a woman is diagnosed, it typically takes months to years of trial and error to find a treatment or combination of treatments to alleviate the symptoms. Experts favor a multidisciplinary, individualized treatment approach that includes one or more of the following: oral “pain-blocking” medications (e.g., tricyclic antidepressants, anticonvulsants, selective serotonin reuptake inhibitors, narcotics); topical preparations (e.g., estrogen, anesthetics, individualized compounded topical formulations); vulvar, pudendal, and/caudal nerve blocks; neurostimulation; pelvic floor muscle therapy (e.g., physical therapy, biofeedback); psychotherapy; and surgery for a select population with PVD.[36]

Future Research Recommendations

Since 1997, the NIH has supported three vulvodynia conferences. The purpose of the most recent consensus conference, held in 2004, was to analyze available data on vulvodynia and related syndromes and develop a consensus paper that would include recommendations for basic and clinical research.[37] The 2004 conference recommendations remain pertinent and The National Vulvodynia Association respectfully requests that ORWH consider these recommendations in planning the next decade of NIH women's health research.

Definition, Comorbid Conditions, and Disease Progression

- Standardize the definition
- Characterize the pain precisely
- Identify comorbid conditions and risk factors for vulvodynia
- Investigate the biologic mechanisms involved
- Clarify antecedent and subsequent sexual dysfunction
- Establish the natural progression of vulvodynia

Diagnosis and Workup

- Include specific education on the diagnosis and treatment of vulvodynia during medical school and residency training programs in women's health
- Develop evidence-based guidelines for assessment

Clinical Management of Vulvodynia

- Commence well-designed, prospective, multicenter trials
- Standardize dosing requirements for pharmacologic interventions
- Address sexual issues

Expand Vulvodynia Research

- Investigate the biologic and genetic basis of vulvodynia
- Increase the number of clinical trials
- Establish a vulvodynia registry
- Establish a national vulvodynia referral network

About the National Vulvodynia Association

The National Vulvodynia Association (NVA) is the only international organization serving both women who suffer from vulvodynia and healthcare providers who treat the disorder. Created in 1994 by five vulvodynia patients, the NVA strives to improve the quality of life of women with vulvodynia through education, support, advocacy and research. To fulfill its mission, the NVA distributes educational resources to patients and the public; develops educational

materials for the medical community, including an online continuing medical education/continuing education accredited teaching program (http://learn.nva.org); advocates for increased Federal funding of vulvodynia research; funds pilot medical research studies; administers a career development award for clinicians who want to pursue a clinical or research interest in vulvodynia; works with the media to promote public awareness of vulvodynia; coordinates an international patient support network; and works cooperatively with other patient advocacy organizations serving women who suffer from conditions that overlap with vulvodynia.

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PAULA GIANINO

Planned Parenthood of the St. Louis Region and Southwest Missouri
Women's Reproductive Health as Top Priority

Good afternoon. My name is Paula Gianino and I am President and CEO of Planned Parenthood of the St. Louis Region and Southwest Missouri (PPSLR), an affiliate of Planned Parenthood® Federation of America, Inc., (PPFA®).

PPFA is the Nation's leading sexual and reproductive healthcare provider and advocate serving women, men, teens, and families. We do more than any other organization in the United States to prevent unintended pregnancies and protect women's health and safety. Planned Parenthood provides the highest quality sexual and reproductive health care, education, and information to women, men, and teens through our 97 affiliates operating nearly 880 local health centers across the United States. In 2006–2007, our affiliate health centers served 3.1 million women, men, and teens. These services include contraception (38 percent of our total services), testing and treatment for sexually transmitted diseases and infections (29 percent), cancer screening and prevention (19 percent), and abortion services (3 percent). We also provided in 2006 comprehensive, medically accurate sex education to an additional 1.2 million women, men, and teens.

It is our real-world experience as a provider of reproductive healthcare services to a predominantly low-income, racially and culturally diverse patient population that informs our policies and advocacy and that necessitates our presence at this important conference.

In January alone, 598,000 jobs were cut in the United States—the largest loss since 1974. Tragically, when Americans lose their jobs, they often lose their health insurance coverage, too. In fact, for every 1 percentage point rise in unemployment, 1 million people become uninsured.

Women, in particular, are affected by this economic downturn. Because of their reproductive capacity, women pay more for their health care than men and because they earn less, these health care expenses make up an even greater share of their income. When women lose their jobs, they are less likely to qualify for unemployment benefits, putting health care even further out of reach. In addition, women and children are more likely to be insured through public programs like Medicaid and the State Children's Health Insurance Program, which are being cut in many States due to the economy.

As the economic crisis worsens, women and their families are increasingly turning to healthcare safety net providers, such as Planned Parenthood and other family planning health centers, for a reliable source of care. At the same time, the State revenue support and private funding that safety net providers depend on is dwindling fast.

This year, Missouri faces a $300 million budget deficit, there are more than 750,000 uninsured Missourians including 146,150 uninsured children (Kaiser Family Foundation), and 350,000 women and teens in need of publicly funded contraceptive services (Guttmacher Institute).

Missouri's teen birth rate went up 6 percent in 2006 compared to a national average increase of 4 percent (Guttmacher Institute).

Despite the clear cost-effectiveness—in addition to health protection—of preventive health care (every $1 spent on publicly funded family planning services saves $4 in Medicaid costs alone), the past administrations in Washington, DC, and in Jefferson City, Missouri, worked hard to place barriers in the way of women's access to advances in contraceptive and other reproductive health technologies. It is time to move from an era of ideology to an era of scientific-based, evidence-based research and health reform. And women's reproductive health care must be a critical cornerstone in any healthcare reform debate and future plans.

For Planned Parenthood health centers across the country, the costs of providing contraceptive care have increased, while access to effective and affordable methods of contraception has decreased. We would urge NIH to assert its leadership to perform the following:

- Encourage the development of more low-cost, safer, and more effective contraceptive methods
- Explore ways to make long-term, reversible contraceptive options affordable and available to more women
- Encourage research and development of dual-modality contraception that also prevents sexually transmitted infections
- Push for more funding to research the efficacy of family planning services, teen pregnancy prevention programs, and more widespread access to emergency contraception
- Assist providers like Planned Parenthood to better understand which particular contraceptive methods are most suited for which women
- Partner with Planned Parenthood and other nonprofit family planning agencies on this clinical research and on advocacy at the State and national levels

In addition, this country has unacceptable rates of highly preventable sexually transmitted infections (STIs). This past August, the Centers for Disease Control and Prevention (CDC) announced the devastating news that human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS) prevalence is 40 percent higher in the United States than we ever thought. And last month, they announced that chlamydia rates are at an all-time high. This news is compounded by another CDC report released this past year showing that one in four teenage girls in the United States has an STI. These concerns are particularly relevant to Missouri. Missouri ranks among the top 15 States for sexually transmitted diseases, with St. Louis rating first in the Nation for gonorrhea and chlamydia (CDC).

Untreated infections of gonorrhea and chlamydia can lead to infertility, chronic pain, and potentially fatal ectopic pregnancy. In fact, chlamydia is the number one cause of preventable infertility. These infections also exact a tremendous economic toll. In the United States, direct medical costs associated with STIs are estimated at up to $15.3 billion annually (CDC). This total cost does not include lost wages and productivity, out-of-pocket expenses, or the costs associated with transmission of diseases to infants.

New treatments, like the human papillomavirus (HPV) vaccine, can improve our ability to reduce the prevalence of STIs in this country. PPSLR is supporting legislative efforts to increase information about and access to the HPV vaccine—and I am proud to say that last year, our affiliate administered more than 3,400 doses of the HPV vaccine to area teens and young women. We are also supporting public policy that would allow for expedited partner therapy when a woman tests positive for gonorrhea and chlamydia. But we need better, quicker, cheaper, and more effective tools to detect and treat STIs earlier. We urge the NIH to make this a priority in women's health research.

Finally, we must address the huge healthcare disparities that exist in the United States based on race and ethnicity. The CDC's 2007 sexually transmitted disease (STD) Surveillance Report shows persistent racial and ethnic disparities in the prevalence of STIs. While representing just 12 percent of the population in 2007, African Americans represented 70 percent of reported cases of gonorrhea and half of reported chlamydia and syphilis cases in the United States [CDC].

Unfortunately, disparities are not unique to STIs; they exist across the spectrum of health care for women. Latinas have the highest rates of new cases of cervical cancer [American Cancer Society]. And despite having a lower incidence of breast cancer, African-American women have a higher mortality rate—32.3 per 100,000, compared to 23.8 for White women in 2004 [National Cancer Institute]. As the National Institutes of Health (NIH) develops priorities for research in women's health, reducing health disparities must be on the agenda. The development of new contraceptives and STI prevention and treatment methods is critically important for women's health, but this research must include a diverse study population as well as comparative effectiveness research to ensure that women of all racial and ethnic backgrounds can receive the most effective health care.

In conclusion, I'd like to thank the NIH for making women's health research a priority. Women have unique healthcare needs, and nobody understands this better than Planned Parenthood. One in four women has chosen Planned Parenthood for health care at least once in her lifetime, and we deliver vital healthcare services to millions of women every year.

As you move forward in developing your priorities for women's health research, we urge you to do the following:

- Encourage research and development of low-cost, safer, and more effective contraceptive and STI prevention and treatment methods
- Explore ways to make long-term contraceptive options available to more women
- Expand efficacy research in areas, including family planning services, teen pregnancy prevention programs, and more widespread access to emergency contraception
- Ensure that women of all racial and ethnic backgrounds are represented in your research
- Make comparative effectiveness a priority to assist providers in determining the treatments and methods best suited for different women

RINO ALDRIGHETTI

Pulmonary Hypertension Association

A Perfect Storm: The Need for and Value of Pulmonary Hypertension Research as a Priority of the Office of Research on Women's Health

Thank you for the opportunity to provide today the perspective of the Pulmonary Hypertension Association on one important area of investment for the Office of Research on Women's Health.

I am honored today to represent the hundreds of thousands of Americans who are fighting a courageous battle against a devastating disease. Pulmonary hypertension (PH) is a serious and often fatal condition where the blood pressure in the lungs rises to dangerously high levels. In PH patients, the walls of the arteries that take blood from the right side of the heart to the lungs thicken and constrict. As a result, the right side of the heart has to pump harder to move blood into the lungs, causing it to enlarge and ultimately fail.

PH can occur without a known cause or be secondary to other conditions such as collagen vascular diseases (i.e., scleroderma and lupus), blood clots, human immunodeficiency virus, sickle cell, or liver disease. Patients develop symptoms that include shortness of breath, fatigue, chest pain, dizziness, and fainting. Unfortunately, these symptoms are frequently misdiagnosed, leaving patients with the false impression that they have a minor pulmonary or cardiovascular condition. By the time many patients receive an accurate diagnosis, the disease has progressed to a late stage, making it impossible to receive a necessary heart or lung transplant.

PH occurs in individuals of all ages, races, and genders. However, women are more than twice as likely as men to develop PH. Women most often develop PH during their childbearing years. Pregnancy can be a painful subject for PH patients because it is associated with life-threatening risks for both the mother and baby.

PH is chronic and incurable with a poor survival rate. Fortunately, new treatments are providing a significantly improved quality of life for patients. Recent data indicate that the length of survival is continuing to improve, with some patients managing the disorder for 20 years or longer.

Eighteen years ago, when three patients who were searching to end their own isolation founded the Pulmonary Hypertension Association, there were fewer than 200 diagnosed cases of this disease. It was virtually unknown among the general population and not well known in the medical community. They soon realized that this was unacceptable, and formally established PHA, which is headquartered in Silver Spring, Maryland.

Today, PHA includes the following:

- More than 9,000 patients, family members, and medical professionals as members and an additional 36,000 supporters and friends
- A network of more than 200 patient support groups
- An active and growing patient-to-patient telephone helpline

- Three research programs that, through partnerships with the National Heart, Lung, and Blood Institute (NHLBI) and the American Thoracic Society, have directed more than $6 million toward PH research
- Numerous electronic and print publications, including the first medical journal devoted to pulmonary hypertension—published quarterly and distributed to all cardiologists, pulmonologists, and rheumatologists in the United States
- A Web site dedicated to providing educational and support resources to patients, medical professionals, and the public that, over the past 9 years, has grown from receiving 600 visits a month to 390,000 visits a month

The Pulmonary Hypertension Community

I am privileged to serve as the President of the Pulmonary Hypertension Association and to interact daily with the patients and family members who are seeking to live their lives to the fullest in the face of this deadly, incurable disease. I would like to share with you the stories of two remarkable PH patients, Emily Stibbs and Charity Tillemann-Dick. Emily's and Charity's stories illustrate the impact of pulmonary hypertension not only on PH patients, but also on everyone who cares about them.

When their daughter, Emily, was 5, Jack and Marcia Stibbs noticed that she could not keep up with the other children in the neighborhood. She seemed to lack the energy and strength to run and play. This condition worsened to the point where she would have to stop and rest after coming down the steps in the morning. Jack and Marcia noticed that when she was sitting on the bottom step in the morning, Emily's lips appeared to have a bluish color.

After pressing for an answer to these problems for several months, Emily was finally diagnosed with pulmonary hypertension and the doctors told the Stibbs family that her probable remaining lifespan was 3 years.

Charity Tillemann-Dick's diagnosis with pulmonary hypertension took not months, but years. When Charity was in her late teens, she had the opportunity to travel abroad and share her considerable talents as a budding opera singer at her grandfather's 75th birthday party in Budapest. Just before the performance, Charity collapsed, but the episode was explained away as a case of nerves.

Over the next few years, Charity continued to have occasional fainting spells as well as a progressive loss in energy. She was diagnosed as being everything from out of shape to anemic. When Charity finally received an accurate diagnosis, her PH had progressed further, and was therefore more difficult to treat than it would have been if she had been diagnosed while the disease was in its early stages.

I am happy to report that, with treatment, Charity has continued to live a full and accomplished life, including performing at several world capitals. Emily, too, has outlived her 3-year

prognosis by 7 years and continues to thrive. There is, however, no cure for pulmonary hypertension. Each day, courageous patients of every age lose their battle with PH.

Thanks to congressional action and to advances in medical research largely supported by the NHLBI and other Government agencies, Emily and Charity have an increased chance of living with their pulmonary hypertension for many more years. However, additional support is needed for research and related activities to continue to develop treatments that will extend the life expectancy of PH patients beyond the NIH estimate of 2.8 years after diagnosis and to raise awareness of this rare, deadly condition.

Recommendations

In December 2006, the NHLBI and the National Institutes of Health Office of Rare Diseases co-sponsored a 2-day scientific conference on pulmonary hypertension. This important event provided an opportunity for leading PH researchers from the United States and abroad to discuss the state of the science in pulmonary hypertension and future research directions.

According to these leading researchers, we are on the verge of significant breakthroughs in our understanding of PH and the development of new and advanced treatments. Twelve years ago, a diagnosis of PH was essentially a death sentence, with only one approved treatment for the disease. Thanks to advancements made through the public and private sectors, patients today are living longer and better lives with a choice of six FDA-approved therapies.

At a congressional hearing on pulmonary hypertension in December 2005, Dr. Mark Gladwin said, “I study what is happening in pulmonary hypertension as an example of what you can do with an orphan disease. With the combination of advocacy, industry involvement, and state-of-the-art basic science, they came together, in a perfect storm of opportunity.”

Recognizing that we have made tremendous progress, we are also mindful that we are a long way from where we want to be in 1) the management of PH as a treatable chronic disease, and 2) a cure. Our needs are in both clinical research and public and medical professional education. PH patients typically visit three physicians before a fourth makes an accurate diagnosis—often losing a year or more and making their prognosis significantly less promising.

With this in mind, the Pulmonary Hypertension Association respectfully requests that the Office of Research on Women’s Health make pulmonary hypertension a research priority now and in the future.

MARY BLADES

Scleroderma Foundation
Mary Blades Testimony for NIH

Hello, my name is Mary Blades and I am the Scleroderma Foundation Missouri Chapter President.

Scleroderma, although a big word to pronounce, is not unlike the ravaging effects it can have on a person's body. Sclero, meaning hard, and derma, meaning skin, is a simple explanation of what it means, but to those of us who have it, it is much, much more. It means that it cannot only affect the skin, which in itself is frightening, but it can also affect internal organs, which can be life threatening. I have seen people with very tight skin and then wonder what in the world their organs must be like. I have witnessed how hard it is to breathe for someone with hard lungs. Their breathing is labored, talking is challenging, and living becomes too much for them. When it affects the gastrointestinal tract, again I have witnessed persons not being able to swallow, limiting their intake, and losing their desire to want to eat—now we all know where that leads. I have also witnessed persons suffering from scleroderma's side effects, one being watermelon stomach; another was suffering from the effects of having contracted another disease. I have witnessed a gal die of breast cancer; a higher incidence is found in women with scleroderma. Scleroderma is chronic pain that can lead to severe depression, withdrawal from society, and the want to give up the fight. Right now, today, I have a friend who is in so much pain that she is continually asking me if there is anymore that can be done for her because she does not want the pain anymore. I can only tell her to continue doctors' orders and go get a second or third opinion. I have given her this advice because sometimes a second or third opinion means a doctor may say or do something that another doctor did not think of, to at least make her somewhat comfortable. You see what is really happening is that the collagen, a protein that heals a wound, for whatever reason, in scleroderma patients, goes wild and will not stop reproducing, thus causing the skin, or perhaps the organs, to get hard.

The Scleroderma Foundation is a nonprofit national organization founded in 1998 whose mission is to provide support, education, and research. It exists for people with scleroderma and their friends and families. The support of patients and families with scleroderma is accomplished through mutual support programs, peer counseling, physician referrals, and educational information. The education aspect promotes public awareness and education through patient and health professional seminars, literature, and publicity campaigns.

The research aspect promotes stimulation and support to improve treatment and ultimately find the cause of and cure for scleroderma and related diseases. The Foundation has been an eye opener for me because it has allowed me to see and meet so many different scleroderma patients and their friends and families and I have seen first hand how varied this disease is. The camaraderie from the Foundation and the people I have met has been therapy for myself, the support has been healing, and the caring has been a treatment. Plus the added bonus that they seek research dollars—research dollars to improve treatment and to find a cure. Because scleroderma is so varied in symptoms, many doctors misdiagnose and a patient can go for years without knowing what is wrong with them. They literally keep getting worse because no one can tell them what is wrong. With some, when a diagnosis is given, the restraint on medication can be severe because doctors are reluctant to give medication for fear of habit-forming drugs. Thus, the patient is left with, again, chronic pain or thoughts of no hope.

I cannot tell you how lucky I have been; I have had the right doctors, I have had determination, I have had the knowledge of what makes my body happy and what does not. Twelve years ago, I was waking up every night with my arms falling asleep. At the time, I was not very

in tune to my body—with the exception of giving birth to four children, the only other sickness I had had was ulcers at the age of 18. After a 2-year bout with that, I was well. I carried and delivered my children without incident. I remember marveling once when I would see sick people how lucky I was to have such a healthy body, not even a headache. Oh, okay, the occasional cold and flu. It was a good thing that I was very healthy because the ulcers left me with this weak stomach that would not tolerate aspirin and only so much Tylenol. So when, after 2 weeks of waking up in the middle of the night with my arms in pain, that last night was more pain than I could bear, I called the doctor the next morning and went in to see her. She did an antinuclear antibody test and found it to show that something was wrong with my body; she just knew that it had to be an autoimmune problem. When she told me that she was referring me to a rheumatologist, I thought she was crazy. This was just my arms falling asleep and they would quit just as soon as you can give me something for it, I thought. Well, I ended up at the rheumatologist, who was not sure what I had but it could be lupus or it could be scleroderma. I wanted a second opinion. I was off to the Mayo Clinic in Rochester, again back in the rheumatology department and with an autoimmune disease diagnosis, probably scleroderma, the doctor said. She wanted to start me on medicine and I refused because my arms were no longer falling asleep and I felt that maybe they were all wrong, although I did not feel really back to normal. Well, 2 weeks after getting back home, I called the doctor at the Mayo and told her about some new symptoms.

My body was literally changing; I could feel it changing by the second. I would look in the mirror and my wrinkles were diminishing; my face was looking like a doll's face, the skin on my hands, arms, and legs were younger looking and was getting very, very hard. The doctor said now we know you have scleroderma and started me on Methotrexate. My skin was no longer changing by the second, but it was also not getting softer. Then a phone call from my sister-in-law, who had seen a news program where a doctor at Harvard was trying, with some success, minocycline. I went to my doctor and she was willing to try it if I wanted to, but she would also keep me on methotrexate. After some time on the medications, my skin started to soften. With the exception of my fingers, I have maintained my softened skin, but after 10 years of being on those two medicines, I had to go off of them because my body started to reject them. I am now on cellcept, in hopes that lowering my immune system will keep my collagen from reproducing rapidly. I can tell that scleroderma is active because I can feel my skin get hard, only not as rapidly as it was in the beginning.

When I first became involved to see what I could do to help others who were not as fortunate as myself and to be sure that research continues toward a cure, I was amazed as to how little was known about this disease. Now things have changed somewhat and more and more is known about it. Because this is mostly a women's disease—if I am recalling correctly, 85 percent of those diagnosed are women—the need to prioritize research on diseases that disproportionately affect women that have no approved therapies, like scleroderma, is imperative for those of us who suffer day in and day out.

PHYLLIS GREENBERGER, M.S.W.

Society for Women's Health Research

The Future of Women's Health Research

The Society for Women's Health Research is the only national advocacy organization dedicated to improving the health of women through research, education, and advocacy. Founded in 1990, the Society brought to national attention the need for the appropriate inclusion of women in major medical research studies and the need for more information about conditions affecting women exclusively, disproportionately, or differently than men. The Society advocates increased funding for research on women's health; encourages the study of sex differences that may affect the prevention, diagnosis, and treatment of disease; promotes the inclusion of women in medical research studies; and informs women, providers, policymakers, and the media about contemporary women's health issues.

Over the past two decades, the Society has had a pivotal role in establishing women's health research in our Federal agencies and in the research community at large. The Society changed the way current biomedical clinical research is conducted by successfully obtaining a congressional mandate that the National Institutes of Health (NIH) include women in clinical trials; that the NIH permanently establish the Office of Research on Women's Health; and perhaps its most influential contribution to science, the 2001 Institute of Medicine (IOM) report, *Exploring the Biological Contributions to Human Health: Does Sex Matter?* The IOM determined that sex does matter in health and disease, from "womb to tomb." The report emphasized the need to carefully evaluate sex-based differences in medical research and incorporate these differences into clinical practice.

Biological differences between men and women result from a combination of genetic, hormonal, physiological, and environmental factors. These differences begin at the time of fertilization, depending on whether an egg is fertilized with a sperm carrying an X or a Y chromosome. Gonadal hormones have organizational and activational effects during development, and to a large extent, these effects influence physiology and behavior throughout the lifespan. Many sex differences are already present at birth, whereas others develop later in life.

Fortunately, scientists have begun exploring potential biological mechanisms for clinically observed sex differences in susceptibility, prevalence, time of onset, severity, and response to treatment for various diseases and conditions. But much more needs to be done.

Heart Disease

Heart disease kills 500,000 American women each year; more than 50,000 more women than men; and strikes women, on average, 10 years later than men. Also, women are more likely than men to have a second heart attack within a year of the first one. Anatomically, women's vessels tend to be smaller than men's. Physiologically, women and men have different blood flow characteristics and differences in electrical activity; evidence also exists for differences in vessel cell behavior and extent of vascular injury, as well as differences in gene expression. Women have

different patterns of plaque formation, higher stroke incidence, older/more comorbidities, less coronary vessel disease, and more valve disease and congestive heart failure.

Despite knowing these differences, women at risk are, to this day, often not referred for diagnostic testing that would be standard for men. Studies have shown in hospital settings that women frequently receive clot-busting therapy much later than men. Women have a higher mortality rate and a higher risk of complications, and yet the healthcare treatment disparities persist.

Neurological Disorders

Men's and women's brains are different structurally and functionally. This may result from a combined effect of sexual differentiation of the brain during development and differences in the localized actions of steroid hormones in various regions of the brain. Additionally, sex differences in neurological disorders have shown the following:

Females > Males	**Males > Females**
Depression	Autism
Anxiety Disorder	Attention Deficit Hyperactivity Disorder
Anorexia Nervosa	Tourette's Syndrome
Alzheimer's Disease	Parkinson's Disease

Drug Abuse

Women and men differ in their characteristics of drug abuse, and this pattern of sex differences is the same for all drugs of abuse. Compared to males, females begin regularly self-administering licit and illicit drugs at lower doses, proceed to addiction more rapidly, and they are at greater risk for relapse following abstinence.

Autoimmune Disease

Three out of four people suffering from autoimmune diseases, such as multiple sclerosis, rheumatoid arthritis, and lupus, are women.

Obesity

While there is no significant difference in the prevalence of obesity between women and men, the prevalence of extreme obesity is higher in women (7 percent vs. 3 percent). Obese women are particularly susceptible to diabetes and cardiovascular disease and have an increased risk of several major cancers, especially postmenopausal breast cancer and endometrial cancer. Women and men deposit fat differently. In general, men deposit fat viscerally in the abdomen and surrounding the internal organs. Visceral fat is associated with increased risk for diabetes and cardiovascular disease (CVD). Women tend to deposit fat subcutaneously in the hips and thighs, but the pattern changes to mimic that of men after menopause. The change in fat deposition at this critical hormonal transition coincides with increased risk of diabetes and CVD in the postmenopausal period. Currently, we know very little about the differences in adipose depots and how fat deposition is regulated differently between men and women.

Lung Cancer

Lung cancer is the leading cause of cancer death in the United States and kills more women per year than breast, ovarian, and cervical cancer combined. Women smokers and nonsmokers appear to be at a higher risk for the development of lung cancer compared to men. In fact, women comprise 80 percent of the lung cancer cases not caused by smoking.

Research has uncovered biological mechanisms for why women smokers are more susceptible to lung cancer. Compared to male smokers, female smokers have reduced DNA repair capacity to fix damaged DNA caused by tobacco carcinogens.

All of these examples clearly demonstrate evident sex differences and where studying sex differences is essential, though barriers to scientific progress persist.

Awareness Among the Scientific and Clinical Research Community

The Society and many scientists devoted to sex differences are spreading the word, and many in the scientific community are beginning to understand the importance of using both sexes in basic and clinical research studies. However, many scientists are still unaware of the importance of including male and female rats, for example, in their studies, as well as analyzing the results of the studies by sex. Another important point of progress relates to the appropriate development of databases, which must consistently use sex and hormonal status as variables to ensure comparisons across studies.

Visibility in the Scientific and Clinical Literature

A major limitation to scientific progress in women's health is that scientific journals do not require authors to report their data broken down by sex. If this were a requirement, scientists would have to design their studies appropriately to ensure inclusion of both sexes in the study design, analysis of results by sex, and dissemination of the results by sex to the scientific community. One important point to remember is that the absence of sex differences in a study is equally as important as the presence of sex differences. Authors should always report when no sex differences are found.

Funding

We would like to see every Institute and Center of NIH funding sex differences research, especially those Institutes whose areas of health and disease have already shown evidence of sex differences. However, several NIH Institutes that receive the most Government funding for research and have extraordinary potential to uncover important sex differences fund the fewest number of sex differences grants. There is room here for change.

Selection of Study Subjects and Study Design

Changes need to take place at the level of the individual experiment and in the study design. For example, even though women are being included in NIH-funded clinical research studies at numbers proportional to the general population, for the most part, disparities in recruitment to all other trials remain. More and more trials are conducted outside government institutions (in 1999, 80 percent of all drug trials were funded by industry), and thus the

mandates of Federal requirements on inclusion have limited impact on non-federally funded clinical research. Further, institutional review boards generally do not evaluate protocols with a view toward determining or measuring retention.

One striking example is CVD, where although it is the number one killer of women, women are still not included in CVD trials at appropriate numbers. On average, many cardiovascular trials show a breakdown of about 20–25 percent female participants to male. Further, a 2007 review of published data from CVD trials showed that of the 628 reviewed studies, sex differences analysis was not performed in three-fourths of trials; 41 trials did not provide the sex of the participants; and 17 trials did not include women at all, even though the CVD condition studied affected both sexes.

The Society believes that to change the face of sex differences research and to improve health care for all women, six fundamental issues must be addressed:

1. First and foremost, physicians must be appropriately trained and educated in medical school, residencies, and in continuing medical education about sex differences in order to communicate the information effectively to their patients. Currently, sex differences research is not included in nursing and medical curricula. This needs to change to become a requirement of academic coursework at medical school. It is an investment in future generations of healthcare providers and investment in the future of medicine.
2. Even if a physician is aware of sex differences in an area of health, they may be more likely to diagnose and treat a patient in a certain way based on the patient's sex. This "Physician Bias" has been noted in two separate peer-reviewed studies, one in the diagnosis of CVD risk factors and the other for treatment of knee osteoarthritis. In both cases, the male and female patients had the exact same conditions and symptoms, but the physicians' diagnosis was more aggressive for the men.
3. Patients, especially women patients, must be informed and thus empowered to ask for sex-specific information wherever possible. This will help enormously to advance the translation of research into practice, as well as advancing the science. However, we do recognize that while patients need to be their own advocates, the system is extremely complicated and not easily navigated to ensure receipt of the best care. How well a patient can make educated decisions about their own, and most often, their family's health, is dependent on many issues.

   Women are still unaware of the dangers of heart disease (2003 American Heart Association [AHA] study of more than 1,000 women conducted by Harris Interactive, Inc). The AHA study showed that a mere 13 percent of women in America believe that heart disease and stroke are the greatest health threat to women. While it was shown in 2006 that more than 50 percent of women understood that heart disease is the number one killer of women, the 13 percent had only risen to 21 percent of those recognizing that heart disease and stroke are the greatest health threat they will personally face.

Women often receive conflicting information when endeavoring to obtain medical information from multiple medical sources such as physicians, family/friends, the media, the Internet, magazines, and direct-to-consumer ads, where each carries with it emotional or social influences. A patient may feel overwhelmed with information and not know how much weight to place on it to make a quality healthcare decision. The media have only added to this challenge by misrepresenting trial results in headlines, causing confusion and panic demonstrated best by the Women's Health Initiative. This can contribute to a patient's confusion and lack of confidence in science.

4. The Society sees a future where sex is a variable in all basic and clinical research design and analysis, and reporting of results by sex, age, race, and ethnicity is a fundamental requirement. Further, scientists should determine and disclose the sex of origin of cells and tissues in their studies. Scientists/researchers must identify the reproductive cycle status of female research subjects. The scientific and medical community should collaborate on programs that will result in the faster translation of basic research results into the clinic and the faster incorporation of new treatments and technologies at physician's offices and hospitals. Finally, scientists should study the influence of sex differences on health and illness across the lifespan.

5. The Society has long advocated that a strong patient-centered comparative clinical effectiveness research program will add value to understanding biological and physiological sex differences that affect disease prevention, diagnosis, and treatment. As we have demonstrated, a complex combination of genetic, hormonal, physiological, and environmental factors influence health and disease in extraordinarily different ways in women and men. Biological sex differences in disease and the response to therapeutics, some of which are present at birth and others that develop later, are pervasive and compelling.

   Comparative research must freely evaluate and compare the clinical effectiveness, risks, and benefits of two or more medical treatments, services, drugs, devices, biologics, care processes, and care management while also taking into account differences based on a patient's sex, age, race, and ethnicity.

6. Research and innovation into new diagnostics and imaging tools is critical to our healthcare system's ability to address new and emerging diseases and illnesses. The Society urges continued development of new innovative medical imaging technologies and diagnostics to further enhance patient outcomes and reduce costs. For example, access to modern cardiac diagnostic and imaging tools is an issue of critical importance to women's health care that goes beyond general prevention efforts. Timely access to imaging results in fewer surgeries and shorter recovery times and hospital stays, saving patients and the healthcare system money.

The Society for Women's Health Research believes that the study of sex differences is the strongest approach to improve women's health. The study of sex differences will benefit both sexes equally and will lead to *better health and better health care for women* and *men.*

SUE BAEBLER

St. Louis Breast Cancer Coalition

The Value of Consumer Advocates, Transparency, and Accountability in Women's Health Research

My name is Sue Baebler, President Emeritus of the St Louis Breast Cancer Coalition (SLBCC). SLBCC was founded in 1992 by a group of concerned breast cancer survivors and activists, and is a registered Missouri nonprofit grassroots advocacy organization. Our motto "Educate, Advocate, Eradicate" means we work to educate the local community with programs concerning all aspects of breast cancer, we advocate adequate Federal funding for well-designed breast cancer research and access to quality care for all, and our ultimate goal is to see breast cancer eradicated through action and advocacy.

SLBCC as an organization has been a member of the National Breast Cancer Coalition (NBCC) for well over a decade. I also serve as the volunteer Missouri Field Coordinator for NBCC, sponsored as such by SLBCC. I welcome the opportunity to present testimony on behalf of the National Breast Cancer Coalition and the St. Louis Breast Cancer Coalition (in agreement on all statements herein) at this hearing on women's health research. NBCC is a nationwide grassroots organization dedicated to ending breast cancer through action and advocacy. The Coalition's main goals are to increase Federal funding for breast cancer research and to collaborate with the scientific community to implement new models of research, improve access to high-quality health care and breast cancer clinical trials for all women, and expand the influence of breast cancer advocates wherever breast cancer decisions are made. The NBCC Fund has developed core values for breast cancer research that reflect its vision and are fundamental to all of its research-related work. NBCCF's Position Statement on Core Values for Breast Cancer Research articulates and describes these values: integrity, impact, accountability, respect, beneficence, justice, shared decisionmaking, and flexibility. These values can and should be applied to all forms of women's health research.

I commend the Office of Research on Women's Health at the National Institutes of Health (NIH) for embarking on this endeavor to collect information and solicit input from scientific and public policy experts, healthcare providers, and advocacy organizations as it looks toward the next decade of women's health research. NBCC strongly believes that the enterprise of clinical and scientific research at NIH could be vastly improved with greater participation from educated healthcare consumers and trained advocates who can help to inform all aspects of decisionmaking at the Office of Women's Health Research and across the Institutes. NBCC also has deep concerns about the lack of transparency, external oversight, and accountability in research priority-setting, decisionmaking, and evaluation. What is important now is to determine the right process for and atmosphere within which women's health research will be prioritized and conducted. We must make certain that the process maximizes our getting the right research done in the right way.

Need for Greater Transparency, Oversight, and Accountability

During this era of change, all Federal agencies, but particularly at the NIH, must embrace and incorporate greater transparency and public accountability at every level and in everything they do. As our nation's foremost biomedical research institution, NIH's lack of diversity in

stakeholder representation and dissenting viewpoints in evaluating programs and projects is alarming. For instance, when the National Cancer Institute decided to evaluate the cancer centers, the committee chosen had a significant number of cancer center directors as members. The NIH Reform Act created the Scientific Management Review Board to conduct periodic reviews and issue reports on organizational issues at NIH. The NIH Director submitted the list of members of this Board to Congress and its membership includes nine institute directors, several major institutions that receive significant funding from NIH, and one industry representative. There were no consumer advocates as part of this Review Board. The Review Board clearly lacks independence and the ability to conduct meaningful oversight.

While there is a great deal of discussion about reform and innovation, there does not appear to be an overarching framework or objectives and a strategy to analyze past funding and to govern funding going forward, at least not one that includes meaningful benchmarks and critical evaluations and is accessible by the public and policymakers. Taxpayers deserve to know that the agency tasked with charting scientific and medical breakthroughs is being prudent stewards of the billions being appropriated to its mission each year.

Consumer Advocate Participation in Research Decisionmaking

Consumers—lay advocates who are trained and educated—can play an integral role in ensuring that the research that is funded is responsive to the needs of both the scientific and patient communities. Their perspective is necessary to ensure that the grants funded are meaningful and will have impact. Consumer advocates bring a vitally important perspective to scientific research. And they keep the scientists on task. Together, they can look at the current state of knowledge, and then design appropriate and necessary mechanisms to allow scientists, in collaboration with advocates, to develop proposals to research the most important questions as well as advise on priorities for funding research. The Department of Defense Peer Review Breast Cancer Research Program (DOD BCRP) has proven that this is an effective and valuable model of scientist–advocate collaboration. SLBCC sponsors one of our members among the many trained consumer advocates involved in the DOD BCRP process.

The peer review process is the accepted method for identifying meritorious scientific trials and studies. However, the peer review process has traditionally excluded those most affected by research—the patients themselves. The peer review process is only enhanced by the involvement of advocate "peers"—activists outside the scientific and medical communities who bring a unique and important perspective to the scientific discussion. Ideally, educated advocates must be included on all research peer review panels, in both the public and private sectors.

Another critical area for advocate involvement is in clinical trials. Advocates can provide important insights into the design of clinical trials and invaluable assistance in increasing awareness and knowledge of clinical trials. They must be substantive collaborators in the research process. Moreover, it is important to have meaningful advocate involvement in scientific meetings in which the Office on Women's Health is involved. Advocates must be part of program planning committees and participate as session chairs or cochairs. There must be opportunities for interaction between scientists and advocates at discussion sessions and in

mentoring programs. Finally, advocates must be provided opportunities to present their work and their perspectives at poster and platform sessions.

Educated advocates can have a meaningful impact on how best to communicate information and research findings to providers, patients, and the public. The NBCC framework for national healthcare reform calls for a national panel to be established to work with the public to review evidence and help design effective methods for communicating healthcare information to consumers, providers, and plans.

An example of where educated advocates played a critical part in the development and evolution of a research project is the Women's Health Initiative (WHI). As you are well aware, it is a large clinical trial, one part of which looked at a particular hormone replacement therapy—progestin plus estrogen vs. placebo—to determine the benefits and risks of that approach. The trial was supposed to end in 2005, but it was stopped in 2002, because the overall health risks of hormone replacement therapy (HRT) exceeded the benefits. In fact, the trial showed an increased risk of breast cancer as well as heart disease, blood clots, and stroke. Women had taken HRT for years before the trial was conducted to look at these issues. While the intervention aspect of the trial was stopped, that is, women were no longer given the drugs, HRT or placebo, as in any well-designed trial, the investigators continued to follow the women.

Several years of following these women after the trial stopped, it was determined that the cardiovascular risks were no longer greater in the group of women who had taken HRT than in the women who received placebo. However, it appears that the breast cancer risk may continue. While the higher risk remained throughout the intervention and the followup period, looking at the followup period alone, the results were not statistically significant. What does that mean? Since we are not certain what drugs the women took after the trial was stopped—or what else changed in their lives—and because the followup was only 3 years, we cannot yet say with certainty that the breast cancer risk continues. We can say it is likely. It is important to keep in mind that the Women's Health Initiative would not have happened without advocacy from the women's community. It is very important to remember that women took these drugs when there was no high-level evidence they would benefit and not harm them. And it is extremely relevant to note that advocacy groups such as the National Breast Cancer Coalition questioned the lack of evidence behind these drugs for many years.

Conclusion

In summary, the agenda for women's health research must be set and implemented in an atmosphere of transparency and through a process that is accountable and includes trained, educated advocates. We must make certain that the public can access and understand allocation of resources and the vast array of research projects being undertaken. NIH must enhance its ability to conduct meaningful science through these changes. Again, I thank you for the opportunity to present these views and look forward to working with the Office of Research on Women's Health and others at NIH to transform the Institutes, conduct meaningful research, and give the American public greater insight and involvement in women's health research and biomedical research in general.

RAUL ARTAL, M.D., AND ROSEMARY B. CATANZARO, M.S., RD, CDE

St. Louis University

Pregnancy, Obesity, and Weight Gain Restriction

The rate of obesity in Missouri and the United States is reaching epidemic proportions at 30–40 percent.[1] The growing prevalence of obesity and related comorbidities has brought into question the current recommendations for weight gain in pregnancy and its effect on postpartum weight retention. The Institute of Medicine in 1990 provided the recommendations as prescribed by obstetricians and healthcare providers.[2] These guidelines are based largely on observational studies that focused primarily on the prevention of low-birthweight infants due to nutritional deficiencies and/or insufficient maternal weight gain without addressing other causes of growth restriction. These recommendations have not considered the consequences of excessive weight gain on the fetus such as macrosomia and the impact of postpartum weight retention on maternal morbidity. Raul Artal, M.D., professor and chairman of the Department of Obstetrics, Gynecology, and Women's Health at St. Louis University advocates the revision of the gestational weight gain recommendations in light of the obesity epidemic.[3] The current guidelines do not distinguish between the different obesity classes in recommending weight gain of at least 15 pounds without an upper limit. In a population-based cohort study from 120,251 Missouri birth certificates (1990–2001), we found that 60–82 percent of obese pregnant women exceeded the 15-pound weight gain recommendation and 35–56 percent exceeded 25 pounds in weight gain.[4] The women gaining less than 15 pounds, however, had a significantly lower incidence of cesarean section, preeclampsia, and large-for-gestational-age infants and the risk of small-for-gestational-age infants was minimal.[4] Gestational diabetes mellitus (GDM) is another comorbidity with a strong link to obesity. GDM affects on average 7 percent of all pregnancies.[5] Furthermore, those who are morbidly obese have almost an 8.5-fold increased risk of developing GDM compared with only a 2-fold increased risk in overweight women.[6]

We have studied a lifestyle intervention of weight-gain restriction in obese women with GDM.[7] The study consisted of 96 total subjects: 39 who agreed to participate in an exercise-and-diet group and 57 who agreed to participate in a diet-alone group. The subjects were prescribed exercise on a semirecumbent bike or walk on a treadmill for 6 days per week at a level not to exceed 60 percent of their aerobic capacity and a eucaloric diet to limit weight gain. After 8 weeks of exercise training, the exercise-and-diet group had significantly more subjects who either lost weight or had no weight change from the time of intervention to the time of delivery than the diet-only group (46 percent vs. 21 percent). Pregnancy outcomes were compared between the two groups. Infant birth weight, vaginal deliveries, and cesarean deliveries were found to be similar in both groups. Of note, there were a total of 27 subjects who lost weight over the course of study, and another 3 subjects who experienced no average weight change throughout the intervention. Table 1 summarizes the pregnancy outcomes associated with maternal weight change during the course of the study.

Table 1. Pregnancy Outcomes by Weight Change Status

	Subjects Who Lost Weight or had No Weight Change (n = 30)			Subjects Who Gained Weight (n = 66)			
Characteristic	**Mean + SD**	**n**	**percent**	**Mean + SD**	**n**	**percent**	**P-value**
Infant Birth Weight (gm)	3286.3 + 399.0			3339.5 + 612.0			0.70
Infant Weight Category							
Normal		23	95.8		43	76.8	
Large for Gestational Age (>4000 gm)		1	4.2		10	17.9	0.12
Small for Gestational Age (<2500 gm)		0	0.0		3	5.4	
Gestational Age at Delivery (wk)	38.6 $\pm$ 1.4			38.1 $\pm$ 1.5			0.17
Delivery Method							
C-section		10	41.7		28	49.1	0.71
Vaginal		14	58.3		29	50.9	

Infant birth weight category was unknown for 6 subjects who lost weight or had no average weight change and for 10 subjects who gained weight. Delivery method was unknown for 6 subjects who lost weight or had no average weight change and for 9 subjects who gained weight.

We concluded from this study that caloric restriction and exercise resulted in limited weight gain in obese subjects with GDM, with a trend for fewer macrosomic neonates, and no adverse pregnancy outcomes. This study is ongoing and the previously published results continue to be validated. Continuation and implementation of this pilot program into our new Obstetrics and Bariatric Center offers a proactive and preventative healthcare approach of lifestyle intervention to prevent GDM and decrease the rate of excessive weight gain during pregnancy, thus lowering maternal obesity rates.

Pregnancy, over the years, has become a time of overindulgence and confinement. In the absence of complications, all pregnant women should continue to maintain a healthy lifestyle of a sensible well-balanced diet and an active lifestyle to promote health benefits to avoid obesity-related comorbidities. Pregnancy is a time when women are motivated to make changes to improve lifestyle and therefore is an opportune time to impact their lives and the lives of future generations. It is our opinion, given the magnitude of the obesity problem and the positive results observed, that this topic should be taken up in large prospective studies.

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LYSE NORIAN, PH.D.

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The Building Interdisciplinary Research Careers in Women's Health (BIRCWH) Program as a Unique Career Development Opportunity for Junior Investigators

I am a former Building Interdisciplinary Research Careers in Women's Health (BIRCWH) Scholar and would like to provide testimony as to the essential nature of this program. Not only did the BIRCWH program provide funding for my salary support at a critical time in my career, but it also provided me with experiences and skills that have proven invaluable to me as a researcher.

The financial support provided to me as a BIRCWH Scholar quite literally saved my research career. I had recently been appointed into a Research Instructor position at Washington University, as my 5-year time limit as a postdoctoral researcher had expired. However, because I was working on a research project that represented a completely new avenue of research for my Principal Investigator and me, my progress had been slow. While my initial results were exciting, I did not have the data and publication record required to compete successfully for funding as an independent investigator on a large grant. Receipt of BIRCWH funding enabled me to continue to pursue this line of investigation, and provided me with the time to obtain necessary data and publications.

In the current economic climate, it is difficult to acquire funding to support one's salary and research, even when one has a lengthy publication record. For new investigators, it is even more challenging. The BIRCWH program is unique because it not only provides critical support to new investigators, but it does so over a period of years, which allows for continuity and freedom from the constant pressures of re-applying for 1- or 2-year grants. Thus, the continuity of support over a 3- to 5-year period, and the fact that the support is targeted specifically to junior faculty, are what make this program so unique and so irreplaceable.

As important as research and salary support are, what makes the BIRCWH program truly outstanding are the intangibles it provides to scholars. First, by promoting interdisciplinary research, the BIRCWH program supports research projects that may not fit neatly into a defined research category. For a junior investigator with a brilliant idea, but no prior publication record in a given field, it is often difficult to transition successfully into a new avenue of research. However, I believe that the future of biomedical research will reside in the formation of multidisciplinary research teams that can efficiently translate basic research findings into the clinic. Thus, it is essential for junior investigators to acquire the skills and mindset necessary to accomplish becoming part of an interdisciplinary research team. The BIRCWH program provides precisely these experiences. By requiring scholars to assemble a team of mentors, the BIRCWH program supports a component of career development that is often overlooked, but which is vitally important to continued and future success as a biomedical researcher. In addition, written and oral progress reports to institutional BIRCWH directors and committee members allow for feedback from distinguished investigators from outside one's own field. These interactions with faculty from diverse research backgrounds greatly enhance the educational experiences of BIRCWH Scholars.

Another intangible that is provided to BIRCWH scholars is the opportunity to network and interact with researchers at other institutions and personnel from the National Institutes of Health (NIH). The yearly BIRCWH meetings foster relationship building among the scholars, and provide a forum for learning about issues relating to women's health that may be vastly different from one's own research area, thus broadening the scholars' scientific perspectives. In addition, having the ability to meet in small groups with NIH employees, to discuss grant application and review processes, among other topics, are opportunities that are not available to most junior investigators, but which are invaluable. The written materials I received from such sessions have become important resources for me. Books on such topics as career development for life scientists were provided at no cost to scholars. The entire program is geared toward providing enhanced research and educational experiences during the first years of being a faculty member. As such, being selected as a BIRCWH Scholar is an event that can profoundly impact the course and success of one's future career in biomedical research.

At a time when the topic of women's success in science is being actively discussed, and many institutions are seeking to identify specific actions that can be taken to promote and retain women scientists, the BIRCWH program stands as a striking example of how research institutions can support the career development of junior faculty—both men and women. Salary support over a period of years, mentorship from a team of successful faculty members, opportunities for and experience in networking, and the promotion of interdisciplinary research projects, all combine to provide an environment where junior investigators can flourish. I feel fortunate to have been associated with the BIRCWH program.

SUSAN PFEFFERLE, PH.D.

Washington University George Warren Brown School of Social Work Research
Getting Health Services to Women: Needs for Blended Funding and Implementation Science

My name is Susan G. Pfefferle. I have a master's degree in counseling psychology and a Ph.D. in social policy with a concentration in health services research. My research involves access to depression treatment for low-income mothers.

I have two concerns related to research on women's health. The first concern related to the Institutes' focus on bench science as opposed to services research. While I truly value the contributions of bench science to women's health and am excited about work on biomarkers as they relate to personalized care, I am very concerned that effective treatments often do not reach vulnerable women. The lack of focus on moving effective treatments from "bench to trench" means that mothers, and ultimately children, families, and society, suffer. Good health is necessary to fully participate in work, family activities, and in society.

For example, we now have very strong evidence that untreated maternal depression can severely impact child social, emotional, educational, and physical development. Long-term studies have shown that children of depressed parents are more likely to suffer from mental disorders. Good bench science and epidemiology studies have also shown us the link between depression, heart disease, diabetes, and obesity. Researchers from Project Viva recently found that when women are depressed during pregnancy, their child's birthweight is impacted, with children being shorter and heavier than children of nondepressed mothers. Another recent study from Project Viva found that months with postpartum depression had significantly increased odds of weight retention 1 year after childbirth. These are very important findings. They show us the link between physical conditions and depression and the need to study these conditions together and not simply as silos of interest.

My own research shows that the most vulnerable women never reach treatment for many reasons. They have no insurance, they are a low priority for community mental health care, and primary physicians and pediatricians most often do not recognize depressive symptoms, especially if the symptoms are mild. Yet even mild depression significantly impacts child outcomes and mother–infant bonding.

So I ask three things. First, that we fund services research that explores the connections between disorders and ways to facilitate access to effective depression treatment across socioeconomic status, race, and ethnicity. I also ask that in genetic research and other bench science, we explore the mechanisms through which depression interacts, causes, and is associated with physical health outcomes. Siloed funding leads to siloed research. Whole patients live in the real world. If we want to improve women's health, we have to undertake studies that look at relationships between disorders. This means we need blended funding with incentives for researchers to work across disciplines. Finally, we need to fund more implementation research on health services for women across disorders. Increased funding for implementation research on women's treatments will lead to effective treatments actually reaching women.

ERICKA HAYES, M.D.

Washington University Pediatric HIV Program

Rising Sexually Transmitted Infections in St. Louis Adolescent Females and its Impact on the Evolving Epidemic of HIV Infection in Area Youth

The city of St. Louis, Missouri, and its surrounding areas have, for more than 10 years, led the Nation in sexually transmitted infections (STIs). We are the number one city in chlamydia and gonorrhea infections and in the top five for syphilis infections in the United States. Sexually transmitted infections in the United States tend to affect adolescents and young adults disproportionately and females more so than males. For chlamydia, the most common STI in St. Louis and nationwide, the leading age group is 15- to 19-year-olds, closely followed by 20- to 24-year-olds. The number of cases diagnosed in females is almost triple the number of cases reported in males, and when broken down by race, African Americans have almost four times the number of infections as their White peers. Nationally, individuals aged 13 to 24 years of age account for 10 million sexually transmitted infections annually, 50 percent of all STIs. This age group also accounts for 50 percent of new human immunodeficiency virus (HIV) diagnoses, 28,000 annually, and it is the only age group in which rates are continuing to rise.

Why are the high rates of gonorrhea, syphilis, and chlamydia important for teenage girls and influencing our youth HIV epidemic? Adolescent females are at higher risk of contracting cervicitis from STIs due to the immature cervix than more mature women. We also know that all STIs are more efficiently transmitted from males to females; often males may have asymptomatic infections as well, leading to further unwitting spread. Significant literature exists to support that genitourinary tract inflammation (cervicitis, vaginitis) from other STIs such as herpes simplex virus, syphilis, gonorrhea, and chlamydia increases the chances of HIV transmission, especially in women. Therefore, adolescent females are doubly at risk for acquiring HIV infection.

In my role as the co-Medical Director of the pediatric HIV clinic at Washington University, we have seen an evolution in the pediatric HIV epidemic locally that mirrors national trends. In 2001, when I joined our group, infants being born with HIV infection were becoming rare. If the mother is diagnosed with HIV in pregnancy and adherent with available therapies, we are very successful in preventing the infant from being infected, bringing the number of infants born annually with HIV in the United States to less than 100, almost all of whom were born to mothers who were not tested for HIV during pregnancy. As far as behaviorally infected teenagers, they were few and far between in 2001, perhaps two to three joining our clinic population annually. However, in 2006, we noticed a significant uptick in the number of newly diagnosed behaviorally infected youth we were seeing in clinics, to greater than 10 annually. In an analysis of newly diagnosed, behaviorally infected youth in St. Louis for the period from 1997 to 2007, we saw a doubling of the number of new diagnoses in the region for that 10-year period. Like national trends, African Americans are disproportionately represented, accounting for 75 percent of diagnoses in this age group compared with the national rate in African Americans of 50 percent. However in St. Louis, we saw disturbing trends regarding young women, in that for this age group in the St. Louis area, 35 percent of new diagnoses were women, for whom their only risk factor was unprotected heterosexual intercourse. This is much increased over the

national percentage of females making up 25 percent of new HIV diagnoses. Both these trends in HIV infection mirror the incidences of other STIs in the St. Louis region.

So we know that there has been a significant increase in HIV diagnoses in adolescents and young adults in the St. Louis region over the past 10 years, and that our regional epidemic in this age group is affecting both African Americans and females more heavily than national trends. What is the next step?

In September 2006, the Centers for Disease Control and Prevention (CDC) announced new recommendations regarding HIV testing in the United States. The main thrust of these new guidelines was to recommend universal HIV screening for all individuals 13 to 64 years of age, disregarding any risk factors. The reasons for this dramatic shift in recommendations were multifold:

1. To make HIV testing a routine part of medical care, attempting to remove the stigma associated with HIV testing that it has carried since its inception
2. To focus resources on identifying HIV-positive individuals, whom data show modify their behaviors after testing positive to decrease transmission
3. To help identify individuals earlier in their infections before decline of their immune system; it is known that individuals have better outcomes with HIV therapies when it is started before the immune system has been compromised. Of note, young adults represent the largest percentage of so called “late testers,” individuals who are diagnosed with HIV within a year of meeting criteria for AIDS
4. To stress that risk-based testing is no longer appropriate, given that fully a third of individuals being diagnosed annually in the United States with HIV infection have none of the classical risk factors associated with those who were infected early in the U.S. epidemic of intravenous drug use, blood transfusion/product exposure, or males who have sex with other men. This especially is true for women, the majority of whom have none of these risk factors

In response to our rising numbers locally and further support by new CDC recommendations, we at Washington University and St. Louis Children’s Hospital (SLCH), with a collaboration between the departments of pediatric infectious disease and pediatric emergency medicine, began work to improve access of adolescents and young adults to HIV testing. After 20 months of building support, planning, gathering resources, implementing, and gaining the support of a CDC grant to support such initiatives, we launched on July 28, 2008, free, confidential rapid HIV testing to be offered to all adolescents 15 years and older presenting for care to the SLCH emergency department (ED). We were the first children’s hospital in the Nation to launch such a program. In September of 2008, free, confidential rapid HIV testing was also launched at the new high-risk youth center, the Supporting Positive Outcomes with Teens (SPOT), as well. There have now been approximately 2,000 youth tested in our ED, and approximately 280 youth at the high-risk youth center. We have diagnosed seven young people with HIV, four of whom were less than 18 years of age since our start, all of whom were identified at the SPOT, for an overall percentage of positive HIV diagnoses at that site of 2.5

percent, which is an astoundingly high number that was much higher than our initial estimates. This is certainly suggestive that the burden of other STIs in the St. Louis area in youth may be allowing for an amplification of transmission of HIV in that same population.

Obviously, there is still much left to be done. Despite the recommendations, the majority of hospitals have not implemented the new CDC HIV screening recommendations. Also, the CDC stressed the recommendation should be applied across practice settings, although the ED, being a point of access to the healthcare system for many patients who may not see a healthcare practitioner regularly, is a logical place to start. We must continue the drive to remove the stigma from HIV, which is now a treatable chronic disease, and identify positive individuals, both to help them maintain their health as well as break the cycle of ongoing transmission. Furthermore, in order to control HIV, control of other sexually transmitted infections that promote the more efficient transmission of HIV is also key, especially for young women. One major stride in this direction is the SPOT, our high-risk youth center that was passionately championed and launched by Dr. Katie Plax of the adolescent center at Washington University in collaboration with the Pediatric HIV program and Project ARK. This center provides barrier-free access for teenagers to free STI testing, including chlamydia, gonorrhea, syphilis, and HIV, as well as free treatment of STIs. They have a close relationship with our HIV program so that identified positives can be immediately plugged into the care and support that they need. Support for programs like this one and at SLCH and the emergence of more programs focused on getting youth tested and treated for all STIs will be key in starting to control and eliminate the STI and HIV epidemics in both young women and young men in the St. Louis region.

KEITH GARCIA, M.D., PH.D.

Washington University School of Medicine

Women's Mental Health During the Perinatal Period—A Pandora's Box

There is growing evidence to challenge the notion that pregnancy protects patients from mental illness. Major depressive disorder during the perinatal period is a common, undertreated psychiatric condition. Although currently pregnant women have a lower risk of having a mood disorder than nonpregnant women, there is a higher prevalence of major depressive disorder during this period (e.g., 20 percent).[1,2] It has been estimated that an episode of major depression occurs in 10–15 percent of all delivering women,[3-6] making it the most common complication of childbirth and a significant public health problem.[7,8]

Maternal depression is a significant burden on the mother and it may adversely impact the child in both the short and long term.[9-11] One of the most significant negative outcomes documented is maternal suicide. For instance, Oates[12] noted that suicide was the leading indirect cause of maternal death (i.e., accounting for 28 percent of all deaths in a sample of 242 maternal deaths from 1997 to 1999 in the United Kingdom). Other investigators have documented that maternal death from suicide increases 70-fold in the first postpartum year.[13] Equally disturbing are the negative impacts on mothering skills, perhaps imposing a risk of physical, as well as mental, harm to the infant.[9,14,15] Research indicates that a significant

proportion of women (i.e., 41 percent) experience thoughts of harming their infants, including aggressive, obsessional thoughts, such as throwing their infant out the window and strangling the infant.[9,16,17] While not pathognomonic of depression, postpartum depression is correlated with impairment in mother–infant bonding. For instance, 10–25 percent of mothers referred for psychiatric care following delivery of their child exhibit disorders of the mother–infant relationship.[18] The existence of depressive symptoms in the early postnatal period has been shown to correlate with mother–infant bonding difficulties up to a year later.[19] Additionally, infants of depressed mothers show a significantly reduced possibility of having a secure attachment with their mother and a raised likelihood of having an avoidant or disorganized style of attachment.[20] Presumably because of this perturbation in normal attachment during early rearing, children of mothers with postpartum depression (PPD) are at significant risk of impaired cognitive and emotional development. Thus, the treatment of depressive symptoms can be potentially lifesaving for both the mother and infant.

Depression that occurs during pregnancy poses some unique challenges for both the patient and the healthcare provider. Many standard screening tools (i.e., Beck Depression Inventory) focus on somatic symptoms and, therefore, make detection of depression during pregnancy difficult. Very little work has been completed on developing specific tools that can take into account the overlap of pregnancy-related symptoms and symptoms of depression. The use of medication during pregnancy remains a controversial and complicated issue,[21] yet maternal anxiety and stress during the pregnancy appear to predict adverse pregnancy outcomes.[22] Treatment of postpartum depression should take into consideration that many antidepressants readily cross into breast milk, and so the risks and benefits of taking antidepressants while breastfeeding should be evaluated in each patient to determine what is best for that patient and her child.[15,23-29] Research addressing these three "orphaned" areas of interest regarding depression in the perinatal period needs to be expanded.

Both interpersonal and cognitive-behavioral therapies have been studied for treating/preventing depression in women during and following pregnancy.[30-35] Some women, however, are unable to take advantage of these therapies or do not respond to them.[36] Despite the frequency of depression in pregnant women, information to guide patients and physicians through the process of considering treatment during pregnancy is limited.[2] As a consequence, many physicians and patients react to this lack of information with a "wait and watch" approach, often with disastrous consequences.

The development of safe and effective alternative therapies for treating perinatal depression would have broad impact and is a socially desirable endeavor, as would a more complete evaluation of our currently available treatment approaches. Because of the liability involved with performing research on pregnant and nursing women with psychiatric illness, this population remains largely ignored by the private sector and treatment outcome studies are few and far between. Thus, Federal avenues of research funding remain the only viable mechanism for assuring that these patients get the attention they deserve.

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JEFFREY HENDERSON, M.D., PH.D.

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ORWH Successes as Seen from the Perspective of a BIRCWH Scholar

First, I would like to express my appreciation for the support given to me through the Building Interdisciplinary Research Careers in Women's Health (BIRCWH) program. This program has helped me tremendously as I began the transition from mentored research toward an independent research career. Through this, I have obtained protected time to establish a research track record and have established a helpful mentoring relationship with several successful and established researchers. It has also helped me to better understand women's health and the outstanding questions in this area.

As we look to the future, I would like to review what it was that drew me toward research topics in women's health as I began postgraduate medical research as an infectious diseases fellow.

Quality of Research

I decided to work with Scott Hultgren at Washington University. He has an established track record of excellent basic research on bacteria causing urinary tract infection. Although I had

completed clinical training in infectious diseases, I felt his laboratory would be an excellent place to gain more experience with research microbiology.

It is clear that attracting skilled researchers increases the visibility and desirability of research in women's health and I hope this fact is considered as we move forward.

Accommodation of Interdisciplinary Research

As a new fellow, Scott Hultgren introduced me to the Specialized Centers of Research (SCOR) in urinary tract infection that he leads and I knew immediately that I wanted to be involved with this. The SCOR brings together researchers from disparate scientific disciplines to weave together new approaches to issues in women's health. As somebody trained in basic biochemistry and completing clinical training, this was exactly the kind of approach I hoped to find as I contemplated the next steps of my career. I strongly believe in this approach and have come to appreciate the groundbreaking nature of this SCOR program that was initiated by ORWH. At meetings and in numerous informal discussions, I have seen and participated in lively conversations in which accommodation of disparate points of view and approaches helped investigators focus upon critical questions. The SCOR organization appears to me to strike the right balance between coordinated and individual efforts among investigators. Investigators work as a group of peers that WANTS to cooperate, not as a hierarchical group that HAS to cooperate!

I hope that ORWH can reflect upon what the SCOR program has done well and either continue it or build similar programs in the future.

Training Focused on Junior Faculty

My continuation in the area of women's health was facilitated by the availability of a Building Interdisciplinary Research Careers in Women's Health (BIRCWH) program at Washington University. With this support, I could explicitly lay out a research plan in the area of women's health and pursue it. As a BIRCWH scholar, I took advantage of the patient samples made available by the existing SCOR program to move quickly on a new research question in urinary tract infections. Despite being at a different institution, Drs. Hooton and Stamm at the University of Washington helped me to utilize clinical samples from their resource fully from project conception to completion. The BIRCWH periodically brings together a mentorship group in which both research and organization issues have been resolved. This group, led by Dr. Tom Baransky, was able to bring parties to the table to resolve problems and to take full advantage of new opportunities. Lastly, the BIRCWH national meeting made evident many of the big questions in women's health. Although women's health encompasses a broad array of topics, the BIRCWH was effective at highlighting commonalities and giving this area a distinct intellectual grounding.

I hope ORWH and NIH can see some of the distinct advantages of the BIRCWH, how it enhances research in women's health and how, in my case, it has effectively synergized with a SCOR.

I would like to close with thanks to ORWH, Dr. Vivian Pinn, and ORWH investigators for their well-considered approaches to improving women's health and I wish them continued success as we look to the future.

RAKSHA JAIN, M.D.

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Gender Differences in Airway Diseases

Women have a higher incidence of many chronic lung diseases than men. The etiology of this disparity is unclear and this represents a significant disease burden in women that requires research attention.

Women have long been recognized as being more vulnerable to inflammatory diseases, including rheumatoid arthritis and inflammatory bowel disease. This gender disparity holds true for certain lung diseases, as well. The medical literature provides clear evidence that women have more severe airway diseases than men. Airway diseases are the most common form of chronic lung disease, including asthma, bronchogenic carcinoma, chronic bronchitis, chronic obstructive pulmonary disease (COPD), and bronchiectasis. It is well established in multiple epidemiologic studies that women have more severe asthma, are more commonly affected by bronchogenic carcinomas, and have a worse outcome from smoking.

The disparity in women suffering from asthma is significant. Women with asthma have a lower asthma-specific quality of life and have more frequent and severe exacerbations than men. Postmenopausal women using estrogen replacement therapy have increased asthma symptoms and more frequent use of bronchodilators. Reasons for these differences and the impact of estrogen therapy represent important questions for healthcare research.

Bronchogenic carcinoma, the most common form of lung cancer, has been progressively increasing in women over the past few decades. The proportion of lung cancer cases is higher in women than in men at any given level of smoking. Bronchogenic carcinoma tissue has an increased presence of estrogen and progesterone receptors relative to normal lungs, and studies have also reported that women are more sensitive to the carcinogenic effects of smoke.

In addition, gender is now recognized as being a risk factor for COPD where approximately 70 percent of early-onset COPD occurs in women. The burden on the healthcare system is significant for these patients and lifespans are shortened by this disease.

Women have also been shown to be more susceptible to chronic airway infections with organisms such as nontuberculous mycobacterial and Pseudomonas aeruginosa, commonly present in bronchiectasis patients. Though these descriptions exist, little is known as to why this gender difference is present.

In conclusion, dedicated research efforts need to be sought to determine if behavioral, environmental, hormonal, genetic, or immune-mediated reasons put women at this disadvantage in airway diseases.

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Medically Underserved Women: A Population in Need

Epidemiology and Prevention Research Group Description

The Epidemiology and Prevention Research Group (EPRG) is a group of research investigators from the Department of Psychiatry at the Washington University School of Medicine. The team conducts randomized behavioral interventions among out-of-treatment, medically underserved women. Women are located through a street-outreach team, drug courts, shelters, and respondent-driven sampling methods. The team has been funded by the National Institute on Drug Abuse, National Institute on Alcohol Abuse and Alcoholism, and National Institute of Nursing Research to conduct a series of these studies since 1987. Over these many years, we have produced culturally relevant, gender-specific human immunodeficiency virus (HIV) prevention interventions that include peer-delivered interventions with HIV, Hepatitis C, chlamydia, gonorrhea, and syphilis pre- and posttest counseling; field-based well-woman exams; and case management strategies to reduce high-risk behavior and improve life outcomes. The team has also developed diagnostic tools to assess psychiatric disorders, substance abuse and dependence, sexual risk behaviors, life events, and exposure to violence, specifically among women. In the years we have been conducting this work, we have found that these women are highly traumatized and that they suffer from numerous comorbid conditions. The women are medically underserved, but are highly motivated to find appropriate care. They are also deeply interested in research and are compliant and cooperative.

Community-based Findings

Over the past 10 years, the EPRG has had the opportunity to intervene with approximately 1,100 women through our NIH-funded HIV-prevention studies. Among those recruited from the community, women have been, on average, 38 years old, mostly African American (87 percent), married (63 percent), with at least one child (85 percent), and employed (57 percent). A third considered themselves homeless and more than two-thirds had a history of arrest. These women were undereducated, with an average of 11 years of education. In terms of health status, women reported major medical issues, including high blood pressure, anemia, weight problems, kidney problems, arthritis, and diabetes. Forty percent reported being diagnosed by a health provider with one or more health problems. Emergency department and health clinics were the most reported venues where care was received. Approximately one-third of the women met *Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV)* criteria for depression. Childhood sexual victimization was common, with approximately one-quarter reporting that as a child they were forced to kiss or touch someone else, one-third reporting they were forced to allow someone else to kiss or touch them, and one-quarter reporting being forced to have sex with another person. Victimization and trauma frequently extended into adulthood with one-quarter reporting recent physical abuse and one-fifth reporting recent sexual abuse. Our data show that history of physical and sexual victimization in childhood, depression, and antisocial behavior predict adult victimization.

Among these groups of women targeted for their HIV risk, substance use was prevalent. More than 90 percent reported lifetime cocaine use, and of those, 81 percent met *DSM-IV* criteria for cocaine abuse or dependence. Alcohol use was also high, with 92 percent reporting use and 65 percent meeting *DSM-IV* criteria for abuse or dependence. Rates of other drug use (or misuse) were reported, as follows: 71 percent marijuana, 23 percent opioids, 14 percent stimulants, 13 percent PCP, 12 percent sedatives, 9 percent hallucinogens, 2 percent club drugs, and 2 percent inhalants. Approximately 18 percent reported a history of injection drug use. Almost half of the women reported participating in residential substance abuse treatment, one-quarter reported having participated in a methadone maintenance program, and 13 percent reported receiving substance abuse treatment through a jail or prison program.

In terms of sexually transmitted illnesses, 4 percent tested positive for syphilis, 2 percent for gonorrhea, 5 percent for chlamydia, and 25 percent for hepatitis C. Myths about how to protect themselves against HIV and sexually transmitted diseases (STDs) were common: 40 percent thought that washing their genitals before sex with soap would prevent HIV and STDs, 40 percent said that "having sex with only healthy-looking people" would protect them from HIV and STDs, and 50 percent asked their partner if they were HIV-positive as a means of preventing infection. Sixty-four percent of the women said that they were victimized in the past 12 months and half of them suffered from depression.

Additionally, our team identified a general level of "chaos" present, which may serve as a barrier to behavior change. As such, we created a Chaos Scale, which categorized more than half the women in our study as having a high level of chaos as determined by the following: using drugs before age 15, having a baby before age 19, being physically or sexually abused before age 15, having one or both parents absent for 6 or more years before age 15, reported sexual promiscuity, or perpetrating violence against someone else.

It is also important to note our team's success in maintaining contact with these women over extended followup periods. Our team has been able to recruit, enroll, and randomize approximately a large number of community women for intervention. Followup rates have been high, with approximately 94 percent of substance-using women returning for their 4-month followup and 96 percent returning for their 12-month postintervention interview. In addition, we have evaluated the impact of chaos, depression, and other psychiatric comorbidities on study participation and have found that these factors do not impact the effort needed to recruit, enroll, and retain women in research, suggesting that community efforts to target hidden populations of women into research are feasible, and that women are responsive.

We have also had the opportunity to work with female offenders recruited through area drug courts and reentry programs. The sociodemographic profile, substance use, and sexual risk behaviors of these female offenders was similar to that of the community-recruited women we've worked with. In comparison to community-recruited women, female offenders were more likely to report lifetime sex trading and rape as an adult. They were also more likely to meet *DSM-IV* criteria for cocaine dependence. Because sex-trading behaviors are inextricably linked with criminal justice involvement and drug use, for the past 5 years, our team has focused intervention efforts exclusively on female offenders. We've elicited specific

information about sex-trading partners and methods of protection from violence as well as pregnancy or sexually transmitted infection. We conducted focus groups with female offenders to understand more about their sex-trading behaviors and learned that while some women reported trading sex for drugs, most needed to trade sex for money to put toward necessities including food, clothes, and shelter for themselves and their children. In fact, many women indicated that they only traded sex for drugs when they were in really bad shape from not having any drugs, because they realized that they were "paid" less for their service when they exchanged sex for drugs compared to when they exchanged sex for money. Further, when sex was exchanged for drugs, women were unable to convert the drugs into money to meet their basic needs.

Among female offenders enrolled from drug courts, we noticed a subset of women who were the most vulnerable—women who traded sex with police officers to avoid arrest. Approximately 25 percent of the women we interviewed reported trading sex with a police officer and many were coerced into this. In terms of protection, compared to those who did not report trading sex with a police officer, these women were less likely to use a condom to protect themselves for HIV and other sexually transmitted infection.

Recently, our team had the opportunity to recontact women who had participated in prior interviews and "deconstruct" the process. It is rare that investigators have the opportunity to debrief women about study participation. In terms of how women felt about the intervention provided through our HIV-prevention research studies, women said testing, counseling, and intervention gave them a sense of belonging. They also said they learned skills to take care of their health. Free testing was also important. Women reported that study staff were persistent, patient, and treated them "like a human being," which was cited as a reason that they continued to come back for followup interviews. Barriers to study participation were lifted with the transportation that was provided. Other women said the following:

- "I felt proud that I completed something from start to finish for the first time in my life."
- "The educational component taught me things I didn't know and it gave me someone to trust."

During this debriefing process, we also asked women to tell us three things they would do, if in charge of the world, to make life easier for other women. These data, straight from women in the community, provide the basis for our team's recommendations, bulleted below. But first, we feel it necessary to note that often women were surprised at being asked this type of question—they indicated that no one had ever asked them what they thought could be helpful. They seemed pleased to be asked this question, which was the last question in the interview process; it seemed to provide a wonderful close to the session. However, the fact that women are not accustomed to being asked what changes would make their lives better seems like a significant oversight in terms of policy and service provision, especially in light of the thoughtful, detailed responses they most often provided.

In terms of responses, the women we interviewed primarily focused on resources and were able to quickly volunteer resources that would be helpful to them and, as such, to other women. They frequently noted that they would provide help with education and job training

to help other women start to take care of themselves, as well as shelter, clothing, food, and health insurance so that women could get on their feet. Among this sample of women, physical, sexual, and emotional abuse were regularly reported, and in addition to emergency shelter for women and children, many women indicated that they felt it important to have counseling or someone to talk to about their abusive situations. Women suggested that it would be important to provide protection for other women from drug dealers and "johns" and they pleaded for someone to stop the physical, sexual, and emotional abuse of women. Finally, in a more global sense, women noted that they would want other women to be independent and mentioned the importance of women in positions of political power, and even as the "bosses" in companies where women are hired.

Policy Recommendations

Necessary strategies to improve the health of these most vulnerable women and to encourage the participation of women in research must address the following concerns:

1. Federal grants should address basic needs of women and children and remove barriers to study participation, completion, and service access. Efforts should include the provision of a) transportation for women and their children to research and clinical sites, b) healthy snacks for women and children at research sites so that they can focus on the questions being asked, c) babysitting services for those women who cannot identify a safe place for their child while they participate in research or receive services. Large practices could make this available.

2. Federal grants should include funds for persistent, professional efforts to sustain women in research or treatment protocols. Our data show that even the most vulnerable women are willing to enroll and fully participate throughout short- and long-term study protocols. However, persistent efforts to engage women, remind them of appointments, and reinforce the importance of the information they provide are critical. The same respectful efforts will help women continue to access and receive care for chronic and treatment-intensive conditions.

3. Interventions can impact behavior. Specifically, we can reduce binge drinking, cocaine use, and high-risk sexual behaviors. Women do want to improve their lives. Care needs to be holistic and specifically target the interrelated barriers women face. The basic needs of women and their families should be considered. Remuneration should be increased to allow women to meet the needs of their families while they are participating in research.

4. More community-based research efforts focused on female offenders, medically underserved women, out-of-treatment female drug abusers, heavy-drinking women, and college-age women are needed to ensure we meet their varied and complicated needs. Interventions should routinely be deconstructed and research funding should mandate this.

Longitudinal studies of women's health must include the most vulnerable women who have more barriers to participation in research and care. These barriers can be overcome. The health of all women is too important to our society as a whole.

LINDA PETERSON, M.D.

Washington University School of Medicine

The Building Interdisciplinary Research Careers in Women's Health Legacy: A Scholar's Perspective

Before my research year of my cardiology fellowship, I had intended to follow in my dad's footsteps and become a clinical cardiologist. But during my research year of fellowship, I realized I really enjoyed research. I enjoyed thinking about mechanisms of disease, seeing how my data turned out, and trying to push the bounds of what we know about heart disease, so as to better prevent and treat it. I was particularly drawn to translational research; I wanted to study humans using novel imaging techniques. But although I had enjoyed some success in obtaining grants (to study the effects of estrogen on the postmenopausal heart), when I joined the faculty, I had no additional protected time and no startup package to assure that I would have the time and the resources to do research.

I knew it wasn't feasible to pursue a very productive research career without support. I applied for the Building Interdisciplinary Research Careers in Women's Health (BIRCWH). I remember saying to myself, "if I don't get this, I'm not going to do research." I got it. I was one of the first BIRCWH scholars at Washington University. The BIRCWH program allowed for me to have a significant amount of protected time and the resources to successfully begin my research career. One of the other major benefits of the BIRCWH program was that it had monies for inviting visiting professors in my field to be my guest, i.e., the professors had to spend time with me discussing my chosen field of research—obesity-related heart disease. This networking and interacting with other researchers in my field was invaluable to my career. These interactions have led to me being invited to lecture at other universities and international meetings, grade abstracts, and write reviews. These professors, leaders in my chosen field of study, knew me and my work because of the BIRCWH and the papers that it generated. Another major benefit of the BIRCWH is that it made me better known to other investigators at my own institution since it required a mentoring committee and presentations of my progress.

Another important aspect of the BIRCWH award and other visionary programs from the Office of Research on Women's Health (ORWH) of the NIH, was that it focused on women's health, rather than lumping men's and women's health issues together. This was insightful. For example, in my BIRCWH study, it was important to study obesity's effects only in women because in a followup study, we found that that women's and men's hearts do not respond to obesity in exactly the same way. Thus, if men and women were combined in my BIRCWH study of obesity, we would have had much less statistical power to detect obesity-related differences in the heart. Further research on sex-related differences in health and disease will help us understand disease processes better and should translate into an improved ability to individualize therapy and prognoses for our patients.

In sum, because of the BIRCWH, I, and others whose careers have been fostered by the BIRCWH program, have been able to pursue research to help us understand not only specific diseases better, but also to understand the important influence of sex on health and disease.

I would like to take this opportunity to thank Scott Hultgren, Ph.D., for the opportunity to submit this testimony; Vivian W. Pinn, M.D., the director of the ORWH; the ORWH; and the NIH for making my research career possible. My recommendations for future research in women's health issues are as follows:

- Given the success and unique vision of the BIRCWH program and others from the ORWH, I very strongly recommend that these essential programs be continued and expanded.
- Given that obesity in the United States is in epidemic proportions (approximately two-thirds of adults are considered obese or overweight), the fact that it affects more women than men, and that we know there are sex-related differences in response to obesity, it is reasonable that obesity should continue to be a focus of research support by the ORWH and NIH.
- Given that heart disease is the number one cause of death in women, and the fact that there are major sex-related differences in prevalence of different cardiac diseases, responses to cardiac drugs and interventions, and outcomes in various cardiac diseases, it is reasonable to assert that heart disease research deserves continued and expanded support from the ORWH and NIH.

JOAN RILEY, PH.D.

Washington University School of Medicine

The Importance of Reproductive Immunology in Women's Health Research

I am currently a Building Interdisciplinary Research Careers in Women's Health (BIRCWH) scholar at Washington University in St. Louis in the Department of Obstetrics and Gynecology. First and foremost, I would like to thank the creators of the BIRCWH program, for I owe them an enormous debt of gratitude. My career took a turn after graduate school as I decided that I wanted to leave academics and explore the possibilities offered by industry. I spent a little more than 2 years in industry before realizing that, although many opportunities are afforded by the industrial setting, I truly missed academics and wanted to return. I needed to start over and complete a postdoctoral fellowship in academics. I was very fortunate in that I found an outstanding mentor, Dr. Kelle Moley, in the OB/GYN department at Washington University. Her support and advice have been fundamental in my career development. I now appreciate why the BIRCWH program places such an emphasis on mentorship. Simply stated, it is essential. In addition, Dr. Clay Semenkovich (Principal Investigator) and Dr. Thomas Baranski (Program Director) have done an excellent job running the BIRCWH program at Washington University. Their support and guidance have enabled me to take full advantage of all that the BIRCWH program has to offer. I hope that one day I can help shape the career of young scientists the way that Dr. Moley and the members of my BIRCWH advisory committee have shaped mine.

After completing my postdoctoral fellowship with Dr. Moley, I was hired as junior faculty within the department. I began to try to obtain a transition award. Quickly, I realized that due to the time I spent in industry, I was no longer eligible for many awards because too much time had passed since I completed my Ph.D. The BIRCWH program was the only program I

found that did not disqualify me based on this criterion. Again, I was very fortunate to obtain the BIRCWH; it has made all the difference in my career. The BIRCWH has provided me with the key to open many doors. I will always be grateful to the BIRCWH program for providing me with the opportunity to have a career in women's health research at an excellent academic institution.

My research interests lie in the field of reproductive immunology. I received my Ph.D. in the Department of Immunology and Pathology at Washington University and I received training in the field of reproduction through my postdoctoral fellowship with Dr. Moley. I believe that Washington University provides an incredibly fertile environment for interdisciplinary research, the exact type of environment envisioned by the BIRCWH program. We are currently involved in several collaborative projects with investigators in the Department of Immunology and we hope that this interdisciplinary approach indeed provides a synergy that will expedite progress in the field of reproductive immunology.

A growing body of data suggests that the maternal immune system plays a fundamental role in establishing a successful pregnancy. However, during pregnancy, interactions between maternal immune cells and fetal trophoblast cells of the placenta would seemingly lead to disaster, as the trophoblast cells are semi-allogeneic and should trigger rejection by the maternal immune response. A fundamental immunologic question of pregnancy as posed by Sir Peter Medawar centers on how immunologic disaster is averted. It is becoming clear that many different mechanisms act during gestation to render the maternal immune system tolerant of the fetus. Importantly and rather surprisingly, a specific immune population, namely uterine natural killer (uNK) cells, has been shown to promote placentation and thus the establishment of a successful pregnancy through the production of cytokines, chemokines, and angiogenic factors. In addition, immune cells are likely important in host defense against pathogens that may invade the uterus during gestation. However, these cells' functions must be tightly regulated at the maternal–fetal interface. Dysregulated elements of maternal immunity have been associated with pregnancy complications such as preeclampsia, intrauterine growth restriction, and recurrent pregnancy loss.

Pregnancy leads to alterations in both peripheral NK cell numbers and their functional activity. These observations suggest that NK cells are hormonally regulated. In vivo studies performed in mice have demonstrated that continuous exposure to estrogen suppresses NK cell activity, which also correlated with enhanced tumor growth or metastasis. The decrease in NK cell activity is thought to be due to decreased production of NK cells by the bone marrow as well as the suppression of NK cell cytotoxicity. Conversely, other data suggest that estrogen may indirectly stimulate NK cells through direct effects on T cells. These opposing results may be due to differences in the duration of hormone exposure or the concentration of estrogen used. Thus, the molecular pathways by which estrogen and progesterone mediate their effects on NK cells and other immune cell populations are multifactorial. Further studies are warranted to clearly define the mechanisms by which estrogen and progesterone mediate their immunomodulatory effects.

Steroid hormone regulation of immune cell function may have important ramifications with respect to several reproductive disorders. Since the birth of the first in vitro child in 1978, it is thought that more than 1 million babies have been born through assisted reproductive technologies (ART). During the course of in vitro fertilization, gonadotropins, which stimulate the production of estradiol and progesterone are administered to infertile women during the course of treatment. As previously mentioned, the duration of hormone exposure and/or the concentration of hormones administered are important with respect to the immune response elicited. Pregnancies conceived by in vitro fertilization are associated with an increased risk for preeclampsia and intrauterine growth restriction. Whether this is an effect of the treatment or is related to maternal factors or both remains to be determined. However, given this correlation, the effect of steroid hormones on immune cell function, and the importance of the maternal immune system in helping to establish a successful pregnancy, further studies examining the relationship between steroid hormones and the immune system are warranted.

Similarly, there are a number of reproductive disorders in which steroid hormone levels are altered. These disorders may also benefit from this line of research. Obesity has become a serious public health issue. It not only has implications with respect to the health of a pregnancy, but also to an individual's overall health. Obese women demonstrate elevated circulating levels of estrogen and are at increased risk of miscarriage, gestational diabetes, and preeclampsia. Moreover, obesity is associated with increased prevalence of inflammation. Again, increased knowledge of the role the immune system plays in pregnancy outcome may help design novel therapeutics that will improve the reproductive health of women.

In summary, understanding the role that the immune system plays in successful implantation and pregnancy outcome and how immune cell function is regulated by estrogen and progesterone is necessary to develop strategies to improve reproductive health and fertility among women. In addition, gaining insight into the mechanism by which steroid hormones regulate the immune system will not only impact fertility, but will also help to understand gender differences in many immunologically mediated diseases such as diabetes or autoimmune diseases and thus, this is an area of research that has far-reaching implications with respect to women's health.

GINA SECURA, PH.D., M.P.H.

Washington University School of Medicine

Proven, Effective Solutions for Reducing STD Infection in Young Women: What We Still Need To Know

Unmet Need

According to the Centers for Disease Control and Prevention, St. Louis City has the highest rates of both chlamydia and gonorrhea infections in the Nation (1,330.3 and 821.2 per 100,000 population, respectively). Our rates of these infections outpace the national average by roughly four- to sixfold, highlighting the dramatic burden of disease experienced in the City of St. Louis.

Currently, there are two clinics in the area that provide walk-in sexually transmitted disease (STD) testing services. The remaining area providers require scheduled appointments for integration into the provider system.

Although the causes for these high infection rates are many, the factors relating to testing and treatment warrant special attention. Testing and treatment costs, for example, are handled differently depending on the site of care, ranging from free screening to fee schedules based on a sliding scale (sometimes requiring proof of income). Other barriers include lack of knowledge regarding availability of testing locations and services; the ease at which testing and treatment can be obtained, level of comfort with testing location; and coordination of testing, results notification, and treatment.

Access to and use of effective methods for identification and treatment in the St. Louis area are somewhat fragmented and inadequately coordinated. The continued inability to effectively diagnose and treat these infections in young women will result in infertility among women of childbearing age.

Necessary Research

Although the disease burden and population at risk is well-documented in St. Louis, an evidence-based approach to sustained STD testing and treatment in young women and their sexual partners remains unclear. Ideally, a coordinated effort between both public and private health providers that builds on the strengths inherent within each provider type would result in an effective network that would reduce the burden of disease in St. Louis or any other area with significant disease burden among young women. Elements of a successful network may include, but are not limited to, the following:

- Community engagement and prioritization regarding STD infection in young women
- Effective communication to increase awareness regarding testing and treatment locations
- Expansion of testing and treatment locations that target geographical areas with high rates of infection
- Identification and sharing of best practices among participating testing and/or treatment locations
- Availability of walk-in testing and treatment options
- Consideration of public and private business model constraints to maximize cost-effective services
- Collaboration among participating locations to maximize price reduction
- Coordinated data collection and analysis to develop evidence-based practice protocols
- Coordinated testing and treatment protocols to ensure—
  - Quality services
  - Stable infrastructure

- Standardization
- Efficiency
- Sustainability

St. Louis is not the only area in the country that struggles with high rates of STD infection among young women without a practical approach to reducing disease burden. Given the limited funds available for implementing and sustaining public health programs, an evidence-based approach to reducing STD infection at the community level is warranted. Research to identify practical and effective methods that will result in the establishment of a collaborative, sustainable, and cost-effective STD testing and treatment network will significantly reduce STD disease in young women within a community.

Innovation: The Potential of Behavioral Economics To Improve the Health of Women

Almost without exception, healthy behaviors involve both costs (e.g., practicing safer sex) and benefits (e.g., avoidance of sexually transmitted infection). In addition, these costs and benefits are typically decoupled over time, with costs often incurred in the present and benefits accrued in the future.

In opposition to most rational models of choice, humans tend to steeply discount future events relative to present events, and do so with surprisingly little regard to how far in the future those events occur. As a result, healthy behaviors are much easier to plan for (because in planning, both the benefits and costs are steeply but evenly discounted), but much more difficult to execute (because present costs loom large relative to future benefits). This effect, known to behavioral economists as hyperbolic discounting, helps explain why people earnestly plan to engage in healthy behaviors, but often fail in executing those plans.

These psychological forces can be surprisingly powerful and contraceptive choices provide a useful template for understanding how these principles work. In practice, failure rates for contraceptive methods vary from less than 1 percent for long-acting reversible methods (such as intrauterine contraception and subdermal implants) to approximately 9 percent for refillable methods (such as oral contraceptives). Rationally, women seeking to prevent unintended pregnancy should select the more effective methods. Yet the national market share for long-acting reversible methods is about 2–3 percent. Annualized costs do not appear to be the decision criteria for women either, because the annual cost of the most effective methods is lower than refillable methods.

Hyperbolic discounting, however, suggests that we carefully account for when the costs occur; annualized costs can be misleading when trying to explain behavior. The most effective methods incur all of their costs (financial and nonfinancial) upfront, and thus these costs loom large both in comparison to the benefits (future pregnancy prevented) and in comparison to refillable methods (in which costs are spread into the future).

We have undertaken a large study of contraceptive choice when 1) all financial costs are eliminated, and 2) women are provided balanced, nondirective counseling on all contraceptive options. Our results, although preliminary, support the principle of hyperbolic discounting. Removing the upfront costs (for all methods) has resulted in a striking proportion of women choosing long-acting reversible methods—approximately 65 percent.

As noted above, nearly all healthy behaviors involve incurring upfront costs for downstream gains. The upfront cost can be substantial or minimal, financial or nonfinancial; the tradeoff is the same. We believe this is also the case for both testing for and preventing STD infection. Within our contraceptive research project, we offer chlamydia and gonorrhea testing at no cost to the participant and provide treatment to the participant and her partner(s) at no cost. Preliminary research findings suggest that women will test for STDs and return with their partners for treatment when access and cost are not an obstacle. In addition to identifying practical strategies for increasing STD testing and treatment, we strongly encourage the exploration, evaluation, and implementation of the relevant findings emerging from behavioral economics into health care for women.

CLAY SEMENKOVICH, M.D.

Washington University School of Medicine

Building Interdisciplinary Research Careers in Women's Health at Washington University

Introduction

The Building Interdisciplinary Research Careers in Women's Health (BIRCWH) Program at Washington University School of Medicine supports the career development of junior faculty members who show exceptional promise for an independent research career that will benefit the health of women. These junior faculty members, known as Interdisciplinary Women's Health Research (IWHR) Scholars, are nurtured as they make the critical transition from junior faculty member to independent investigator. The program targets individuals who have recently completed clinical training or postdoctoral fellowships, bridging the gap between this advanced training and research independence. It also crosses different scientific disciplines and areas of interest in women's health through a mentor pool of independent scientists representing various departments.

The goal of the Program at the Washington University (WU) School of Medicine is to produce independent investigators conducting interdisciplinary research in women's health. To achieve this goal, our program has identified outstanding young scientists committed to women's health who have completed fellowship training, matched them with mentors working in an environment that promotes interdisciplinary research, and provided them with career development experiences leading to their independence.

Initiated in August of 2000, the Washington University BIRCWH Program has supported the careers of 15 Scholars. The Program provides a combination of a mentored research

experience (utilizing additional mentoring from a Scholar Career Development Committee, analogous to a thesis committee), didactic training, interaction with other Scholars and prominent visiting scientists, and the establishment of formal interdisciplinary research links with clinical programs related to women's health. In addition, the Program provides salary support for the Scholars, which enables Scholars to devote a majority of their efforts to developing their own independent research program. This support comes at a pivotal time in the development of the Scholar and is essential for fostering their careers as biomedical researchers in the area of women's health.

Need for Research in Women's Health

Through the support of the Office of Research on Women's Health, our Program has helped to address an unmet need in the area of biomedical research in women's health. For years, studies of women's health and gender issues were neglected either because of the flawed assumption that biological responses in women would be the same as in men or because of the concern that pregnancy might complicate recruitment and interventions. As described in *Agenda for Research on Women's Health for the 21st Century, Vol. 7. New Frontiers in Women's Health,*[1] major depression, osteoporosis, autoimmune diseases such as lupus, urinary tract infections, and type 2 diabetes, to name a few, are all more common in women than men. Heart attacks and certain cancers are more deadly in women than men. The outcomes of attempting to become pregnant are not always perfect and include birth defects, preterm labor, and infertility. Women respond to therapeutic drugs in ways different from men. Our BIRCWH program establishes a broad research base addressing each of these issues. As described in *Exploring the Biological Contributions of Human Health—Does Sex Matter?,*[2] gender differences and their effects on disease could be better understood by addressing problems with the expertise of multiple disciplines, an approach seldom pursued, perhaps due to historical impediments to communication and cooperation. This report called for more synergy among scientists with different talents, enhanced collaboration between medical specialties, and better bench-to-bedside research and integration of data. The organization of our program and the substantial new resources committed by our institution are aimed specifically at these systematic barriers to research progress.

The Washington University BIRCWH program shares the view of Dr. Vivian Pinn (Director of the Office of Research on Women's Health at the National Institutes of Health [NIH]) that "The women's health movement…can and will bring benefits to all members of our society." It is our goal to continue the successful training of outstanding interdisciplinary researchers in women's health.

The Biomedical Research Environment at Washington University

Washington University School of Medicine is one of the world's leading medical research institutions. In fiscal year 2008, the school received $367 million in grants from the National Institutes of Health, making it the fifth-largest recipient of NIH dollars among U.S. medical schools. The School of Medicine possesses a rich tradition of interdisciplinary collaboration, fostering an exciting environment in which basic science and clinical medicine are very closely connected.

The School's faculty is extremely accomplished; 17 Nobel Laureates have been associated with the School. World-class facilities support faculty research, including core facilities for DNA sequencing and genetic analysis, biostatistics, clinical research, transgenic support, higher brain function studies, cell and tissue culture, morphology, protein and lipid analysis, molecular design, information management, monoclonal antibody production, mass spectrometry, nuclear magnetic resonance spectroscopy, oligonucleotide synthesis, and X-ray crystallography. A state-of-the-art imaging research center provides positron emission tomography, 3-D image processing, magnetic resonance imaging, computer graphics, spiral-computed tomography, and radiopharmaceutical production.

Clinical fellows in every subspecialty of medicine are trained at Barnes-Jewish Hospital and St. Louis Children's Hospital, the teaching hospitals for the Washington University School of Medicine. Both are part of the BJC Health System, one of the largest integrated healthcare delivery systems in the United States. BJC was the first health system in the country to combine urban, suburban, and rural healthcare facilities with an academic medical center, Washington University Medical Center. Barnes-Jewish Hospital has an outstanding reputation in patient care, medical education, research, and community service. Clinical fellowship training at Washington University emphasizes a strong research component, ensuring the availability of clinical scientists with the potential for research careers in women's health.

Training in the basic sciences at Washington University School of Medicine is organized and supported by the 11 graduate programs of the Division of Biology and Biomedical Sciences, a graduate educational consortium that includes faculty affiliated with 20 basic science departments in the School of Medicine and College of Arts and Sciences. More than 600 students are pursuing Ph.D. degrees and more than 400 individuals are pursuing postdoctoral research through the Division. The Division also operates, with the School of Medicine, the largest Medical Scientist Training Program (MSTP) in the country, with 178 trainees pursuing the combined M.D.-Ph.D. degree. The Division of Biology and Biomedical Sciences represents a local model of interdisciplinary research. Most of the BIRCWH mentors are members of the Division.

Program Organization

Career development of scholars is achieved by the following:

- Providing formal didactic training for appropriate IWHR Scholars
- Providing protected time (75 percent or greater) for a focused, mentored research experience for all scholars
- Providing formal training in the responsible conduct of research for all scholars
- Establishing a seminar series for BIRCWH mentors and scholars consisting of journal clubs devoted to issues specifically relevant to women's health, and research presentations in which both mentors and scholars discuss the results of ongoing projects
- Providing a formal research link to existing and future clinical programs related to women's health at Washington University

- Tailoring a career development plan for scholars to the needs of the prospective candidates. In general, the program contributes to the career development of two types of scholars:
  - Individuals with considerable prior research experience (such as M.D.-Ph.D.s and Ph.D.s) and a particular interest in research that will benefit women's health
  - M.D.s who have completed a subspecialty fellowship involving research training and wish to pursue research that will benefit women's health

For both types, these are individuals who have not served as the Principal Investigator or equivalent on an NIH R01, K01, K08, P01, or P50 grant.

The Mentoring Experience

An essential component of the success of training our future biomedical researchers is the availability of mentors to guide Scholars in the early phases of their career. A strength of the Washington University BIRCWH program is its pool of mentors. These accomplished scientists are interactive, committed to developing the careers of those interested in a research career in women's health, and are known for conducting interdisciplinary research that, in many cases, has already made important contributions to improving the health of women. Scholars obtain a focused research experience by spending at least 2 years with an individual mentor, but the interactive nature of the program and the considerable collaborations within this mentor pool ensures that scholars have extensive exposure to many different disciplines in the course of addressing biological problems related to gender and women's heath.

The mentor pool has evolved over the past several years to reflect our commitment to provide the best training possible to those selected for the program. Scholars can now select from mentors representing 10 focus areas: autoimmune disease, cancer, cardiovascular disease, complications of pregnancy, depression, diabetes/obesity/metabolism, epidemiology/health services research, genetics/pharmacogenomics, infectious diseases, and osteoporosis.

Success of Scholars

The Washington University BIRCWH program has had a significant impact. The most tangible evidence of this impact is our success in preparing Scholars for careers as independent investigators specifically performing interdisciplinary research that will benefit the health of women. Some of our former Scholars have achieved international recognition for their work based on invitations to speak at forums, service on editorial boards, and the provision of scientific input to other major research centers. One, Bettina Mittendorfer, has clearly become a major figure in her field. Bettina has an impressive record of publications and grant support. She has developed novel techniques for assessing lipid metabolism in humans using stable isotopes and used these techniques to provide unexpected insights into the effects of gender on fuel metabolism. Her findings have the potential to uncover completely new approaches to obesity. She received RO1 support for her research, is a frequent speaker at scientific conferences throughout the world, and has won the Peter J. Reeds Nutrition Research Award from the American Society for Nutritional Sciences.

Linda Peterson is another former Scholar who has made important contributions to women's health. Using sophisticated imaging techniques such as positron emission tomography in humans, Linda has identified specific physiologic signatures in young obese women that appear to be powerful predictors of abnormal myocardial function. Her work was featured by the NIH at previous BIRCWH symposia in Bethesda. She has been elected to the editorial boards of the journals, *Clinical Therapeutics* and the *Journal of Women's Health.*

Fanxin Long is an excellent example of how the program has directed the research career of an outstanding young scientist toward research relevant to women's health. An elite molecular biologist, Fanxin could have joined the faculty in an environment focused exclusively on basic signaling mechanisms. Instead, Dr. Long was recruited from Harvard to Washington University as an Assistant Professor in the Bone and Mineral Division (a recruitment enhanced by the possibility of funding through the BIRCWH program), where his talents in intracellular signaling could be applied to an area directly relevant to women's health, osteoporosis. He has published important papers in top tier journals such as *Cell* and *Nature Medicine,* linking key signaling molecules to the formation of bone. He is now a major figure in bone metabolism, has obtained RO1 support for his research program, and is well on his way to generating a body of work with great potential to improve women's health.

Another former scholar is Consuelo Wilkins, now an accomplished clinical investigator, who has established herself as a research authority in the area of health problems in aging women. She has been honored by the National Medical Association as one of the best physicians in the country.

Current Scholars

We currently have three outstanding Scholars. The first Scholar, Jeffrey Henderson, M.D., Ph.D., represents an example of the potential for the Washington University BIRCWH to interact and complement the Center for Women's Infectious Disease Research (cWIDR). Jeff did his postdoctoral training in the lab of Scott Hultgren, where he developed a novel project that utilizes the tools of mass spectroscopy for phenotyping and discovery analyses to study the impact of siderophore-mediated iron acquisition by *E. coli* on urinary tract infection in young women. A second Scholar, Joan Riley, Ph.D., trained in the lab of Dr. Kelle Moley in the Department of Obstetrics and Gynecology here at Washington University. She has initiated studies to examine the role of the immune system and the effect of hyperglycemia in placental development. Our third Scholar, Christina Gurnett, M.D., Ph.D., did her fellowship research in the lab of Dr. Anne Bowcock, an expert in human genetic disorders. Christina has developed a project for gene discovery in adolescent idiopathic scoliosis. We are excited about the potential of each of these Scholars and will continue to assist them in their development as biomedical researchers focused on diseases directly affecting women's health.

Institutional Commitment to Women's Health and the Role of the BIRCWH Program

Major initiatives in the next decade at Washington University will be focused on disease-based multidisciplinary research areas in women and children's health, cancer, infectious diseases, cardiovascular and metabolic disorders, and neurosciences. The centerpiece moving forward is

BioMed 21, which is designed to expedite the translation of basic science discovery and human genetic data into the clinic. BioMed 21 includes a new 240,000 square foot building to house five interdisciplinary research centers. The Center for Women's Infectious Disease Research (cWIDR) represents one component of BioMed 21 and demonstrates the institution's commitment to women's health. The mission of the cWIDR is to prevent and cure women's infectious diseases by fostering collaborations between basic and clinical researchers in multiple disciplines around shared interests and causes. The BIRCWH program has worked closely with the cWIDR program and the Director, Dr. Scott Hultgren, who is on the BIRCWH Advisory Board. Dr. Hultgren and his colleagues have made seminal contributions to the field of recurrent urinary tract infections and role of bacterial biofilms. The BIRCWH program will continue to coordinate efforts with the cWIDR to train biomedical researchers in interdisciplinary studies on important topics in women's health.

The BIRCWH program has been successful by providing a focal point for research in women's health at Washington University. The administrative office and Program Director serve as a resource for promoting women's health and encouraging young investigators interested in women's health through the coordination of visiting speakers, providing information about potential mentors, conducting regular seminars featuring the research of the mentors and scholars in the program, and by providing an informational portal to the broad availability of women's health resources at Washington University. We look forward to continuing this effort and furthering our mission to train the next generation of biomedical researchers focused on issues in women's health.

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WILLIAM J. LEDGER, M.D.

Weill Medical College of Cornell University

New Dimensions and Strategies for Women's Health Research

Currently employed techniques to implement studies of women's health are flawed. Investigations to determine the factors causing pelvic infection in nonpregnant women and to find the source of premature labor and delivery have followed a similar pattern. Epidemiologic studies comparing women with bacterial vaginosis (BV) and those free of this problem have related BV to pelvic inflammatory disease (PID) and premature labor. Subsequent trials to prove these associations are cause-and-effect-related have fallen short. A prospective clinical study

comparing those women with BV at the onset of the study, and those free of BV, showed no increase in the subsequent incidence of PID in the BV group. Similarly, a large study of asymptomatic pregnant women with BV showed no decrease in the prematurity rate in those women given oral metronidazole, an antibiotic known to be effective against BV. In each study, the association with BV was proven not to be causation. Using the Gram stain technique of Nugent to make the diagnosis of BV lumps together a diverse clinical population. This population includes symptomatic women, asymptomatic women, those who clear BV spontaneously, and those who have frequent recurrences despite appropriate antibiotic treatment. Another mark of the diversity of the BV population is that the Amsel diagnostic criteria, three of four observations of a homogenous vaginal discharge, an alkaline pH, a positive whiff test, and 20 percent or more of the vaginal squamous cells being "clue" cells yields a much smaller BV population than the one confirmed by the Gram stain technique. Lumping together a diverse population of women eases the job of the assembly of a large population of women for prospective trials, but diminishes the chances of determining the exact--risk population that should be studied.

The current population of women now categorized as having BV needs to be teased out into a number of diverse separate groups, who can then be subjected to prospective trials. One measure to accomplish this would be to use nonculture techniques to identify the subgroups in this diverse population, now lumped under the category of BV. Nonculture data are available from normal Caucasian, African-American, and Japanese women, which would serve as a documented standard for comparison. In addition, there are a number of gene polymorphisms associated with either a propensity for tissue inflammation or infection, potential factors for both a risk of PID and premature labor and delivery in pregnancy. The subsequent subgroups would be ideal study populations in whom to determine causation and treatment.

JANE MURRAY

Women in Balance

Urgent Need for High-Quality Research on Bioidentical Hormones

"Bioidentical" is a term used to describe those specific hormones that are identical in their molecular structure to ones made in the human body. According to this definition, "bioidentical" hormones include many that are manufactured by pharmaceutical companies as well as individualized formulations made by compounding pharmacists, both types prescribed by authorized medical practitioners. Some bioidentical hormone products such as dehydroepiandrosterone (DHEA) and low-dose progesterone are also available without prescription over-the-counter.

The NIH held a consensus conference on menopause in 2005 about managing menopause-related symptoms,[1] but gave only brief attention to any discussion of bioidentical hormone options, and prepared comments by one presenter included erroneous notions of the definition of "bioidentical" as being only compounded preparations with doses determined by saliva testing. David Sturdee, President of the International Menopause Society, wrote a textbook on hormone therapy in menopause, and devoted an entire chapter to a discussion of bioidentical hormone options.[2]

So widespread is the confusion regarding hormone nomenclature that the North American Menopause Society (NAMS), in its 2007 position statement on hormone use in peri- and postmenopausal women, discusses bioidentical hormones only in the context of compounded preparations and does not mention the use of bioidentical hormones manufactured by the pharmaceutical industry.[3] This confusion may partly stem from a 2004 review of bioidentical hormones by Boothby et al., which narrowly defines bioidentical hormones as "hormone treatment with individually compounded recipes of certain steroids in various dosage forms, including DHEA, pregnenolone, testosterone, progesterone, estrone, estradiol, and estriol."[4] Bioidentical hormones are simply those steroids with a chemical structure identical to the ones found in humans, and not necessarily individually compounded medications.

The medical literature and subsequent lay media reports are very often unclear in differentiating between conjugated equine estrogens, estradiol, and other estrogens, and simply discuss the risks and benefits of "estrogen" without clarifying which estrogen was studied or in what delivery format. Similarly, the term "progesterone" is widely used when discussing the effects of all hormones in the progestogen category, without being clear as to whether medroxyprogesterone acetate, norethindrone, other synthetic analogs of the progesterone molecule or actual progesterone is being reviewed. While some general class effects of steroid hormones do exist, this paper hopes to clarify that there can also be some distinct differences in biological effects that vary with the chemical structure of the molecule being used for hormone therapy.

Patients are similarly bewildered about whether to take hormone therapy (HT) at all, and if so, what their options may be. Breslau et al. reported on a survey of women's knowledge of and attitudes about HT and reported that more than 60 percent of women aged 40 to 54 and 54.4 percent of those aged 55 to 64 were "worried about the effects of HT" and "felt uninformed about the Women's Health Initiative (WHI) findings."[5] Schonberg et al.'s 2005 publication of the results of an attitudinal survey about medical care and HT reported that 26 percent of women reported "losing trust in medical recommendations generally" and 34 percent were less willing to take drugs to prevent heart disease.[6] Another survey documented responses with emotional overtones such as worry, confusion, anger, and grief as common reactions by women following the WHI report.[7] A small qualitative study of hormone therapy preferences and experiences of symptomatic perimenopausal and postmenopausal women revealed that subjects preferred "bioidentical hormones" over conventional hormone therapy. Subjects characterized physician attitudes as antagonistic in response to their requests for bioidentical hormone therapy, whereas nurse practitioners and pharmacists were perceived to be more knowledgeable, informed, and compassionate regarding hormone-related symptoms and hormone therapy options, including bioidentical hormones.[8]

An increase in interest about and use of "bioidentical" hormone therapy has emerged in recent years as women seek options other than the hormones (conjugated equine estrogens and medroxyprogesterone acetate) used in the WHI study, and read books written by both medical and nonmedical authors about hormone options. National and international organizations such as the North American Menopause Society in 2007, the Endocrine Society in 2006, and the International Menopause Society in 2007 have seen a need to specifically mention and discuss

bioidentical hormones in their position papers about menopause and HT.[3,9,10] In addition, NAMS sponsored a special conference in October 2005 on bioidentical hormones that was so popular, there was standing room only during the day-long session, suggesting high healthcare provider interest. What remains troubling to some about the policy statements of these groups is their misunderstanding of "bioidentical hormones," implying that only compounded preparations are "bioidentical" and excluding discussion of all the commercially available isomolecular hormone preparations.[3] At least two commercial pharmaceutical manufacturers of hormone products for relief of menopausal symptoms and other women's health concerns refer to their FDA-approved products as "bioidentical": Solvay's Prometrium® and BioSante's Elestrin®.[11,12,13]

Clarity in terminology and reference to specific molecular structures are becoming more important if clinicians and researchers are to make any consistent sense of the research about women's hormones and translate that research into clinical utility. Assumptions that all hormones within a class act in the same manner and carry the same risks are sometimes incorrect, and not borne out in published science about certain specific hormone molecules.

Compelling Questions Requiring Further Research

Numerous questions remain unanswered about bioidentical hormones, and therefore ongoing research is very much needed. Some important continuing concerns of women and their practitioners include the following:

1. What are the optimal hormonal components useful for abating significant menopausal symptoms if present and interfering with daily function? Head-to-head trials are needed, such as direct comparisons of the following:
    a. Estradiol versus conjugated equine estrogens (CEE)
    b. Compounded estriol/estradiol mixtures commonly in use versus CEE and versus estradiol alone
    c. Other non-bioidentical estrogens in use or in development versus bioidentical estrogen(s)
    d. Progesterone versus various specific progestins (as very little data exist directly comparing progesterone to any progestins other than medroxyprogesterone acetate)
2. What is the optimal dosage range of various estrogens and progestogens? This "optimal" range is based on what information—symptom relief, side effects, monitoring of levels?
3. Is hormone monitoring necessary? If so, what should be measured: saliva, urine, serum, whole blood, red cells? Does the assay methodology vary depending upon the specific hormone and/or delivery system? And what target levels are appropriate—luteal, follicular, or some other level?
4. What is the safest and most effective delivery system—oral, transdermal, vaginal, transmucosal? Does this vary by which hormone is being delivered?

5. What are the long-term risks and benefits of various hormone regimens?
6. How much progesterone in what delivery format is needed to protect the uterus from the proliferative effects of various estrogen types, doses, and delivery formats?
7. Is cycling progesterone necessary or preferable? If so, what doses are appropriate and at what interval?
8. How long should a woman use HT?
9. Is use of progesterone alone safe?
10. What do women know and want to know about HT options? A national survey of women's use of HT of various forms, knowledge about options, sources of information, concerns, and questions about HT is long overdue.

It is clear that despite a great deal of research in the field of women's hormone therapy for menopause, many important questions remain unanswered. Women want and need options that are effective and safe, and physicians and other women's health providers need guidelines that are based on accurate information. A wealth of research already exists about the efficacy and safety of some bioidentical hormone preparations. The evidence for safety, especially for progesterone over some progestins, is mounting every year.

Precision in terminology is also critically important as clinicians review the literature and discuss hormone options with patients. National organizations, opinion leaders, and the media must be particularly accurate in their use of nomenclature when discussing "hormone therapy" or the effects of a specific hormone molecule.

We need a clear research agenda for women's health and hormones. The definitive study about hormone therapy in menopausal women has not been accomplished with the WHI—only more questions have arisen as a result. Now is the time to actively promote further studies through the National Institutes of Health and private foundations. In the meantime, clinicians must practice the best medicine possible, given the current state of the science on bioidentical hormones, and growing evidence that all hormones and delivery systems are not created equal.

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MISSY LAVENDER

Women's Health Foundation

Women's Pelvic Wellness—Shifting the Paradigm in Women's Health

In America, if we consider the critical health issues of women young and old; women of childbearing or post-reproductive ages; active, healthy women; and women at risk of severe health conditions such as diabetes or heart disease, pelvic health does not necessarily come first to mind. Yet issues of pelvic health and wellness will affect the majority of women at some point in their lives and while they may not lead to death, they may lead to inertia or inactivity or worse—depression, obesity, anxiety, hypertension, or diabetes.

Take Tina (name changed) for example. As a young girl, she was a competitive gymnast, practicing high-impact moves such as floor routines and dismounts from the beam for hours on end. She experienced a little leaking of urine upon dismounting from the beam, especially after long practice sessions or in competition, but chose not to focus on it, hoping her sweat would hide the accident. When Tina later married and had a baby, she found she was constantly wearing a pad to avoid leaking, especially when she laughed, coughed, or picked up her new son. Tina finally went to her see her obstetrician after her last baby was a year old and the leaking had gotten so bad she was afraid to do any of the fitness activities she had loved as a young woman. Her condition, stress urinary incontinence (SUI), or accidentally leaking urine, affects one in three new mothers and approximately 30 million women in the United States. Most often caused by pregnancy and vaginal deliveries, it has been shown in research that high-performance college athletes like Tina—especially those engaged in high-impact sports—have a higher risk of SUI than do their nonathletic peers. With her history of leaking during physical activity as a young girl, might it have been prudent for Tina to have had a regimen of pelvic floor exercises before, during, and after pregnancy? Should her pregnancy and delivery have been managed with this predisposition in mind and, if so, what might have been different?

Pelvic health and wellness does not just involve urinary problems like incontinence (stress or urge). The reason it is such a compelling topic is because it includes numerous conditions that all have the common thread of being pelvic centered. Sexual dysfunction (1 in 4 women), fibroids (80 percent of African-American women), uterine prolapse (1 in 2 mothers), pelvic floor dysfunction (somewhere north of 50 million), constipation (4 million people, most of them women), and pelvic pain (estimated at 20 million women) are just a few. When we look at the statistics of women affected by all the above, it is hard to imagine that all of us don't have something going on "down there." Yet, when you look at the total dollars spent on research for pelvic health, it is difficult to even tabulate the total. In 2007, the NIH's reported outlays for research detail that $526 million was spent on urinary disorders, and an additional $3.5 billion on women's health. It is unclear how much might have gone directly into research about women's pelvic health and wellness.

Stepping back slightly from just dollars and cents, when we project forward the numbers of women suffering from some issue around their pelvic health, we have to ask why then aren't women clamoring for solutions? Why isn't there a prescribed algorithm of care for a new mother that includes pelvic floor rehab? Why don't all pelvic surgery patients get sent to a pelvic floor physical therapy (PT) to learn both the strengthening exercises they may need, and to also unlearn any bad habits they may have that might lead them to cause their surgery to fail in the future? For that matter, why don't more women know what pelvic floor PT is, or about urogynecology as a medical subspecialty to turn to when symptoms start to occur?

Our position is that we first have to understand and address our American, Puritanical attitudes about anything that goes on in or around a women's pelvis. For most women, the only word they might identify if you are discussing pelvic health topics is a "pelvic," which they know as that embarrassing or painful exam they get (hopefully) once a year by their gynecologist. Women in the United States are unaware that all these conditions are "common, but not normal." When they experience symptoms of pelvic floor dysfunction or other conditions, they feel

like they are the only one with this or that problem and often fail to seek care from their healthcare provider, fearing the surgery or drug prescription that they think is imminent. Concerning as well, is a statistic from the National Institute for Continence that says it takes a women four times bringing up symptoms of incontinence with their healthcare providers before they get treatment—whatever "treatment" means. These facts lead us to believe strongly that we need to both fund more and better research into all the pelvic health conditions, but also fund campaigns of public awareness that speak to our need as women to understand our bodies from the inside out, so we can be prepared if something starts to go sideways.

We advocate for women standing up and learning and moving toward a healthier pelvis. We know that if women are "fit, sexy, and in control," they will have a higher self-image and be more physically active. We know that women (and girls) of all ages can be taught basic facts about their pelvic health and wellness that can change their lives. And we know that physical activity needs to start to happen "down there," as well. Women well into their later years can learn to recruit their pelvic floors properly, thereby even potentially slowing down the inevitable decline in continence or prolapse. At the Women's Health Foundation, we ask, "What would it be like for women in their 30s and 40s to be engaged in their pelvic health and wellness all during their younger years? Would they be able to refute some of what we now think of as "a normal part of aging"? Could they indeed be dry, free of pain, and able to manifest optimal sexual health? We believe all this and more are possible when you engage women in conversation about this central place in their bodies—their pelvic core.

MAURA RIORDAN

Women Organized To Respond to Life-Threatening Diseases
Women and HIV/AIDS: Filling the Research Gaps

Organizational Background

Women Organized To Respond to Life-Threatening Disease (WORLD) was founded in 1991 by and for women living with human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS). A small group of women came together to create peer support when they could not find services specific to the needs of HIV-positive women. They wrote a newsletter with an inspiring cover story featuring a woman living with HIV that went out to 200 readers. Today, that same newsletter goes to 12,000 readers in 87 nations. WORLD provides support, advocacy, and education to women living with HIV/AIDS locally in the San Francisco Bay Area, and nationally through a variety of projects.

WORLD's HIV University, a 12-week intensive training on advocacy, treatment options, and physical and emotional self-care, has graduated nearly 300 inspired and enthusiastic women, committed to advocating for their own medical needs and sharing their heightened level of HIV knowledge with other women and supporters in their lives. WORLD holds semiannual educational retreats that strengthen social networks, reduce isolation, and provide education and up-to-date treatment information and tips on accessing high-quality medical care for HIV-positive women worldwide, including the United States, Canada, Israel, and Africa. WORLD's

Peer Advocate Program is staffed by women living with HIV, including specialized Latina and perinatal advocates, who have experienced a positive test result and the subsequent overwhelming process involved in accessing good medical care. Peer advocates help HIV-positive women advocate for improved care and resources when the woman herself is unable to, and provide emotional and practical support. Prevention Outreach with Women Empowering Risk Reduction, WORLD's innovative peer-led HIV prevention project that works specifically with African-American girls between the ages of 16 and 19, focuses on gender issues, sex, and HIV prevention through promoting risk reduction and decisionmaking strategies. Additionally, the Speakers Bureau offers intensive training for HIV-positive women and their allies in telling their personal stories in an effort to combat stigma and provide important prevention messaging.

WORLD recently launched the National U.S. Positive Women's Network (PWN) in June of 2008. The PWN is designed to strengthen the strategic power of women living with HIV in the United States by identifying, supporting, and cultivating meaningful leadership and relationships among HIV-positive women; building capacity for collective action between individuals and organizations working in the field of women and HIV; and engaging in policy analysis and strategic campaigns to change and improve public policy. The PWN has a national membership of more than 700. WORLD also offers the Lotus Project, a national skill-building training for HIV-positive women who are interested in becoming peer advocates.

All of WORLD's programming is based on a peer empowerment model. More than 75 percent of our staff are HIV-positive women, and the same percentage are women of color. This strengthens our ability to develop and implement projects that are relevant and culturally competent to our target population.

Suggested Areas of Research

There are large gaps in research in relation to women at risk for and those living with HIV/AIDS. We believe that much of the HIV prevention in the United States has failed women and this is because it is not informed by what is happening on the ground for women. There must be a stronger understanding of the structural issues that put women at risk for HIV in this country. These issues include poverty, gender-based violence and inequities, high incarceration rates in particular communities, and HIV stigma. The relationship that these issues have to HIV infection among women must be studied, understood, and integrated into prevention strategies. Women who are becoming infected are not necessarily exhibiting "dangerous" behaviors. Many of them are sexually active women who are married or in relationships that appear to be monogamous, but are unaware of their male partner's risk factors or history.

We would also like to see more research on the impact of peer-led interventions focused on women living with HIV/AIDS, including the impact of peer support and peer advocacy on treatment adherence, overall health outcomes, and risk reduction. Although we can see the immense benefit of these interventions among the women we serve, there is a lack of research in this area.

An additional area where we would like to see further research is the impact of HIV stigma on women. We see the impact on the ground: hesitation in getting tested, fear of medication being discovered by others, lack of disclosure, shame related to pregnancy or desire to become pregnant, etc.

There also needs to be more advocacy and support for research to find tools that put the power of negotiating safer sex in the hands of women (microbicides and vaccines).

WORLD believes that it is important to emphasize research that addresses the structural, biomedical, behavioral, and sociocultural issues pertaining to women's vulnerability and risks for HIV/AIDS, as well as understanding the care-seeking and support needs that are specific to women living with HIV/AIDS. Moreover, research must examine the dynamics of women's relations and social networks to understand the intricacies of both risk and care seeking. Studying women within a vacuum without acknowledging the relationships they are engaged in and the roles that they play within families, neighborhoods, communities, and economies fails to study women holistically.

An area of research that merits further study is the impact of male circumcision on the risk of HIV acquisition to women. Most studies only highlight preliminary information and do not examine long-term impacts on how such an intervention actually produces changes in behaviors and attitudes about sex that men have and the consequences for women.

Our concern includes whether men will continue to have safe sex after circumcision, whether condom use will happen, whether men will heal fully from the procedure before becoming sexually active, and the overall long-term impact on female sex partners. We believe the call to scale-up circumcision globally has not been sufficiently thought out and additional data are needed in this area.

CLAIRE CHOSID

Self

Chemotherapy's Effect on Breast Cancer Patients After 10 Years

Please excuse the informal nature of this response. I just found out about this and I'd like to be involved in some way. My concern is personal. I had chemotherapy 11 years ago for a late stage 2 breast cancer. In the following years, I have been inundated with autoimmune diseases and heart issues. I have been struggling with memory/focusing issues, as well. I am wondering if the medical profession is addressing the fate of women who have survived cancer (with chemotherapy), but have gone onto other serious medical issues. Three years after chemotherapy, I was diagnosed with lupus. Eight years after chemotherapy, I was diagnosed with congestive heart failure and viral cardiomyopathy. Last year, I was diagnosed with celiac disease and thyroiditis. I am currently taking classes that lead me to believe that I am having some memory/retention issues. I don't know if this is what you're looking for; I would like to be involved in some way if it were possible.

ELLEN HEISLEN, PA-C

Self

Chronic Fatigue Syndrome

Thanks to the faculty and staff at Washington University for sponsoring this very important panel discussion today. I appreciate the opportunity to speak about a silent, crippling, disabling disease known as chronic fatigue syndrome (CFS). As a former healthcare provider, I would like to put a face and a voice to chronic fatigue syndrome.

Everyone has fatigue. However, the fatigue experienced in CFS is severe, unrelenting fatigue resulting in a marked reduction in activity levels. Other symptoms include the following:[1]

- Brain fog—Difficulty with short-term memory and concentration
- Poor sleep—Nonrestorative sleep
- Headaches/Migraines
- Muscle and joint pain/Fibromyalgia—Diffuse achiness
- Bowel dysfunctions—Irritable bowel syndrome
- Flu-like symptoms
- Anxiety/Depression
- Recurrent and persistent infections

I feel there are three main causes to CFS:

I. Infections

- Viral infection: Epstein-Barr virus (EBV), human herpes virus type 6, cytomegalovirus (CMV)
- Bacterial infection: Methicillin-resistant Staphylococcus aureus (MRSA)
- Fungal infection

II. Hypothalamus Suppression in Brain

- Sleep disorder
- Hormonal dysfunctions, including adrenal, ovarian, and thyroid
- Autonomic nervous system—Neurally mediated hypotension
- Low body temperature

III. Immune Dysfunction

- “Fight or flight” response—Immune system is in overdrive
- Infections—The four most common are EBV, human herpes virus type 6, CMV, and post-polio syndrome

CFS affects 6 to 10 million women in America, ranging in ages from adolescents to seniors. The other day, I spoke with a women age 70 who had just been diagnosed with CFS.

CFS takes women out of the workforce and away from their families. As of 2003 research outlines in 800 pages of text, there is still no treatment for CFS.[2]

In closing, I am here today to impress upon you all of the importance of research and funding toward the diagnosis and treatment of CFS. This complex, multisystem disease syndrome impacts areas in neurology, immunology, and infectious disease. Any crossover research in these areas will also provide insight into other disease processes, as well.

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ROBERT KOKENYESI

Self

The Role of Start-Up Biotechnology and Medical Device Entrepreneurs in Translating Academic Research Discoveries Into Cutting-Edge Diagnostic and Treatment Applications

The betterment of women's quality of life is closely linked to improvements in the diagnostic and treatment options women's health care can offer. The academic research community has greatly advanced the understanding of the molecular and physiological bases of many diseases of ageing, reproduction, and cognition affecting women.

However, the tremendous academic discoveries are rarely followed up by movement of those discoveries to the bedside of afflicted women. In other words, the advancements from academic research laboratories are not commercialized rapidly into clinically useful diagnostic and treatment solutions. Therefore, our great investment in women's health research is not paying a comparably great dividend when it comes to healthcare solutions.

One root of this difference between academic research success and lagging commercial application is that academic research laboratories have little incentive to wade into the process of commercialization, because these laboratories are valued for their ability to bring in grant money, but not for starting new business enterprises. Although the technology transfer offices of universities keep track of academic discoveries, they are not enabled to stimulate or assist the formation of new enterprises around academic discoveries.

Another root of the problem is that there are very few scientists/physicians who could turn entrepreneurs, because the current training of Ph.D.s and M.D.s do not typically include preparation for entrepreneurial activities. Those few entrepreneurial-minded scientists/physicians who would like to start a new business to exploit academic discoveries are discouraged by

the enormous financial risk and the potential loss of their academic tenure once they become full-time entrepreneurs.

A third root of the problem is that starting a new company focusing on diagnostic or therapeutic products is expensive. Because of the very early stage of the product development in start-up, the venture capitalist or angel investors may not provide early funding. Therefore, entrepreneurial-minded scientists/physicians are discouraged from taking research discoveries to the bedside, and, as a consequence, the healthcare improvements for women's needs are slow to appear.

One possible way to increase the translation of academic discoveries into new diagnostic and therapeutic advances would be if government granting agencies (National Institutes of Health, National Science Foundation, and others) could increase funding allocation to small business enterprises headed by scientists/physicians. Another possible way to increase the translation of academic discoveries into new diagnostic and therapeutic advances would be if not-for-profit disease-specific organizations would invest in small business enterprises focusing on new diagnostics and therapeutic approaches.

PATRICIA MARSH

Self

Women's Health Priorities

- Cancer research
- More affordable public clinics
- More birth control information and availability

COLLEEN MCKEE

Self

The Challenges Faced by Lower Income Women With Depression and Bipolar Disorder

With Amanda Crowell Stiebel, I recently edited *Are We Feeling Better Yet? Women Speak About Health Care in America,* published by PenUltimate Press, an independent press that specializes in women and minority healthcare issues. The anthology, a collection of personal narratives, mostly from the perspective of women patients, has empowered me to be a more understanding advocate of women who are ill and underrepresented in our nation's current healthcare debates. Particularly, I am interested in the challenges women with mental illness face, especially lower income women with clinical depression and bipolar disorder. These are illnesses that are typically invisible and therefore, often overlooked, even by medical professionals, even when they are asked for help. Also, it is an ugly truth that many women, even working women with some degree of insurance, cannot afford adequate treatment for serious mental healthcare problems.

There are many financial obstacles for lower income women with depression and bipolar disorder. According to the Kaiser Family Foundation, nearly 17 million women are completely lacking health insurance. For women of color, these numbers are disproportionately high. Women who do have health insurance are much more likely than men to be covered through a spouse's work-based insurance plan. In an economic climate such as today's, with rising unemployment, this is rather precarious, as, in this situation, if a married man loses his health care coverage, so does his wife or partner, as well as, potentially, the children. Also, it is notable that economic stresses have always been a contributor to divorce, as well as stress and depression. If a woman is dependent on her man for her healthcare coverage, she could really be in a crisis if they divorce. Women who are not dependent on men are more likely to simply be uninsured in the first place. For example, lesbians are twice as likely as heterosexual women to be uninsured. Additionally, many Americans who are insured have subpar mental healthcare benefits to begin with.

For example, one of the essayists in our anthology, Sara Ohlin, visits a doctor specializing in women's health care hoping to be treated for her persistent insomnia and what she thinks may be depression. As a woman with two jobs, baker and writer, one would think she could afford adequate health care, but she quickly realizes this is not the case when the doctor tells her she can have her well woman visit, or talk about the insomnia, but not both, as the insurance companies don't give doctors much time. The doctor compromises, giving Ohlin her rather divided attention as she attempts to give her a pap smear and ask her a few questions about insomnia at the same time. When she realizes Ohlin's insurance will not cover a therapist, she hurriedly writes a few prescriptions for an antidepressant and a sleep aid, announcing, "You don't seem clinically depressed. I mean, you're not suicidal." In fact, she had asked her few questions that would lead her to a reasonable conclusion that her depression was not clinical—for example, she had not found time to ask about family history, recurrence of symptoms throughout the patient's lifetime, or even whether or not she was feeling suicidal or inclined to hurt herself or others. Unfortunately, with the kinds of restrictions insurance companies frequently impose both on patients and doctors, this is not uncommon.

Often, even patients who do invest in premium health insurance find the cost of health care prohibitive. When essayist Anita Darcel Taylor finally finds a drug cocktail that stabilizes her bipolar disorder without exacerbating her obesity, she is shocked when the doctor's samples run out and she finds that she will have to pay $450 in copays per month for the top-tier drugs. As a woman, her salary is already lower than the average man's; as an African-American woman, she is more likely to go without the healthcare coverage she needs; as a single woman, she lives without a safety net. In this case, the safety net may make the difference between life or death, as she is, during her depressive episodes, frequently suicidal.

We hope that our anthology can help women patients' stories find the ears of caring and honorable physicians, researchers, and policymakers. So many hardworking women who have so much to offer society, despite the challenges of mental illness, should not be restricted from doing so because of inadequate health care. I am honored to have this opportunity to join the national discussion on this crucial issue.

DIANE RUBAII

Self

The Need for Research on Methicillin Resistant Staphylococcus Aureus (MRSA)

Everyone knows about breast cancer; there are little pink bows, marathons, and corporate giants that give a percentage—AIDS red ribbons, Elizabeth Taylor, Design Industries Foundation Fighting AIDS, Bono, Diabetes, The Fire and Ice Ball, and a plethora of other organizations and sponsors. But when it comes to Methicillin Resistant Staphylococcus Aureus (MRSA), there are no pretty ribbons, no corporate giants dipping into their big corporate pockets, no celebrities willing to put a face on a rather ugly and insidious infection that wreaks havoc with one's immune system much in the same way a hurricane destroys everything in its path. That's precisely what this infection does.

I have first-hand personal experience as the primary caregiver of my mother, who developed an MRSA infection in 1997 and is now still dealing with the aftermath of this disease on her body. The only drug in the United States in 1997 to combat this so-called super bug was Vancomycin. Other drugs were being tested in France, which were only available in trials here in St. Louis. The problem with these other drugs is they cause liver and kidney damage. MRSA attacks every organ in the human body. Hospitals don't want to talk about it because it's their dirty little secret that must be kept under wraps. Medicare will not even pay for a person who survives MRSA. The cost of care is astronomical. Please make this a priority. Please give the institutions such as Washington University the funding and the means to put an end to this bacterial nightmare.

ARETHA WEBB

Self

Implementation of Ethics and Morals Back Into Our Community

My name is Aretha Webb. I am a caregiver and patient advocate and am glad that you and the National Institutes of Health (NIH) are interested in the public's comments on women's health care. The need for ethics and morals should be considered at each facility before funding research with Government funds, implementing applied ethics as part of the thread and fabric of being in America, and should guarantee its citizens with the best of health care, especially when they are insured like my Mom was. My main priority is to initiate such a need for ethics and moral values in my community and globally because of my Mom.

Mom was a stay-at-home Mom for years, raising the children while Dad worked three jobs. He had to, as they had eight children. Mom was diagnosed with breast cancer the first time in her early 40s, then again in her late 50s in February 2003. She came through those bouts with flying colors. Her treatment in the hospital was okay and she experienced good treatment from nursing. In 2004, when Mother was diagnosed with multiple myeloma (cancer of bone and blood plasma), her hospital treatment that would follow was challenging, lacking care and substance that was not expected of a hospital.

There were incidents of physical abuse and neglect from every job-level position in the healthcare profession in that particular hospital. Some of the abuse I witnessed first hand, with one of the incidents including me begging for nursing to help my Mom with her pain. Nursing interpreted my concerns as a power struggle, but Mother moaned and groaned in agonizing pain, and was in a state of mind where she was unable to verbally ask for help for her pain. This was the only time I took the initiative to contact her doctor and inform her of the situation. Later that night, my Mom's doctor contacted me back after speaking to nursing and apologized that the nurse misread the written orders for a higher dosage of pain medicine to be given to my Mom. The best thing the hospital did for my Mom was to allow me to care for my Mom all night in the hospital each time she was admitted.

In the middle of May 2006, my Mom suffered a bad reaction from a new medicine that was given to treat a bad infection (MRSA) and was neglected and treated very badly, and even worse than that, I had no knowledge of the reaction. I had left to go home earlier that day to rest, clean up, and cook dinner for the rest of my family. When I called the hospital to check on Mother, they told me she had a little swelling, but she was fine. When I got to the hospital, Mother was drowning in her own fluid and in her room alone, reaching for me for my help. She was disconnected from her IV. A suction pump was off to the side, as if someone had worked on her and just given up and left her for dead. No one told me of the suction usage on her and the true health condition she was experiencing. I protested and yelled and asked nursing what happened. They finally told me of the reaction to the medicine she received, and that that was what caused the swelling and buildup of fluid in her chest. I demanded they treat the reaction, so they treated her with steroids to fight the reaction. They connected the suction back up, and though mother could not speak because of her extremely swollen tongue protruding out of her mouth, she—for the first time—took her fist and fought the nurse who was treating her. She was letting me know in her own way that something terrible happened. The point I want to make is that my mother was dying and she knew it and I knew it, but she was willing to go onto the eternal world, minus the unnecessary trauma bestowed on her.

I am requesting time to speak to anyone who will listen about the importance of having good ethics and morals while and when caring for patients who are terminally ill. I am currently hopeful that the NIH would only fund those programs that only have a high regard for applied ethics in my community, the African-American community. Our community—regarding my Mom—did not offer optional treatment that could have prolonged her life, even if she had not suffered complications from abuse and neglectful behavior from her healthcare providers. The need for such integrity and accountability (concerning ethics and morals) is so vital for the terminally ill, it could have most likely prevented the development of my Mom's shingles; shattered hopes; and staph (MRSA); along with abuse, which eventually caused her death. I would love to share my Mom's story to anyone who will listen—in churches, schools, and public forums.

Public Testimony
University of California, San Francisco
San Francisco, California
May 27, 2009

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Build Heuristics To Assure Sufficient Information and Efficient Negentropy and Integrate Them Locally and Globally To Ensure Meaningful Genesis of a Map for Future Strategies of Women's Health

I have come from a developing country, India. And I know how vivid is the reality there when your leaflet states, "more than one-half million women die of preventable causes related to pregnancy and childbirth every year, 99 percent of whom are in developing countries; for every woman who dies, another 30 are estimated to suffer long-term disabilities related to reproductive maternal causes." We are also aware that a large number of the above-mentioned casualties can be avoided by simple means that are neither expensive nor complex. Nevertheless, as a scientist, I am involved in so-called cutting-edge-technology-based research to understand molecular endocrinology of blastocyst implantation and to elucidate novel molecular classification of endometriosis; both are directly related to women's heath. Yet, there is no true contradiction between these two realities. On the contrary, I believe that there is a clue in it to inform the future road map for improvising strategies in women's health, at least for India.

What does it mean? It means that we need to adopt multipronged approaches while moving into the future of women's health with women at the center and women at the periphery. I shall mention three major areas of research interest.

Firstly, at the grass roots level, women need to possess sufficient education and empowerment so that they can execute their reproductive choices and inculcate health at the individual level, family level, and community level. Sufficient and integrative research at different levels with historical and geographical contexts is needed to appropriately understand the nature of several inhibitory motifs existing in sociology, sociobiology, social psychology, economics, and politics that impose a counterfeit effect on women's education, empowerment, and health. In India, we may safely state that the agenda of women's empowerment and health has never taken even a taxi run for such multifactorial convergence onto the deception process to women, as mentioned above, despite Jawaharlal Nehru's draft for the 1937 Congress manifesto. And there is only meager understanding about it.

Secondly, high-end research related to women's health and the disease needs to be encouraged both locally and through global collaboration. The expansion of knowledge base shall, in turn, dispel some of the above-mentioned inhibitory motifs in specific as well as unspecific manners. Also, it shall promote better knowledge about the biological basis of women's health and disease. The metaphysical currency and futuristic heuristics of the second wing of the proposed strategy give to it the true strength.

Thirdly, there is a requirement of research to evolve serious approaches to attend the unmet need of meeting the above-mentioned two wings together, both through local as well as global endeavors. It is an unfortunate fact that these two wings, albeit perceived and flapped to some extent at individual capacities, did not fly high synchronously for lack of suitable research and exploration into the third domain, namely integration with and interfacing onto public contexts.

Finally, I believe the policymakers need to undertake the triple helix process (as Professor Richard Lewontin mentioned, however in a different context) involving philosophies, strategies, and tactics while creating a road map for a newer future for women's health. Strategies generated on the substratum of philosophical nothingness shall sink into (as has mostly happened in developing countries by and large) in the jungle of tactics' tentacles.

CHERYL HEALTON, DR.P.H., M.P.A.

American Legacy Foundation

Including Tobacco in the ORWH Research Agenda: An Essential Step Toward Improving the Health of American Women

The Board of Directors and the staff of the American Legacy Foundation® (Legacy) urge the Office of Research on Women's Health (ORWH) to give the prevention of tobacco use, smoking cessation, and tobacco-related disease a prominent position within the research agenda being developed for the National Institutes of Health (NIH) ORWH. Including tobacco in the ORWH research agenda is a critical first step toward improving the health of women in the United States.

Smoking is a Social Justice Issue

National Health Interview Survey data show that, in 2007, 17 percent of all women over age 18 in the United States were smokers, with substantially higher smoking rates among women with lower levels of education and income.[1] For example, 39 percent of women with a General Educational Development-level education smoked in 2007, as did 26 percent of women living below the Federal poverty level.[1] In fact, as a result of decades-long trends in which those with greater educational and financial resources smoke at lower rates,[1,2] quit at higher rates, [2,3,4] are more likely to be covered by health insurance,[5] and are more likely to promptly seek medical care,[5] tobacco use has become not only a public health issue, but also a social justice issue.[6]

While the relationship between socioeconomic status and tobacco has been well documented, there are certain populations within which smoking rates are believed to be high, and yet a scarcity of data often relegates these groups to the sidelines of tobacco control interventions. Among these populations are gay, lesbian, bisexual, and transgender individuals and racial/ethnic minorities, such as American Indians and Alaska natives.[7] Disparities are compounded by the fact that smoking translates into mortality at different rates within different population groups. For example, African-American women smoke at lower rates than White women, but have higher death rates resulting from cancer.[8] A great deal more research will be needed before we can unravel the many factors influencing smoking and smoking-attributable disease and death in these populations.

Smoking-Attributable Morbidity, Mortality, and Costs to Society

Between 2000 and 2004 (the most recent data available), the Centers for Disease Control and Prevention (CDC) estimates that 173,940 U.S. women died annually as a result of tobacco-related disease.[9] The leading causes of smoking-attributable death among U.S. women were

heart disease, cerebrovascular disease, and lung cancer.[9] It is further estimated that approximately 18,000 U.S. women died annually during the years of the study period as a result of exposure to secondhand smoke.[9] Collectively, these deaths represent more than 2 million years of potential life lost to U.S. women each year.[9] Furthermore, in each year from 2000 to 2004, the CDC estimated that 776 infant deaths were caused by smoking during pregnancy.[9] In addition to the devastating impact of these deaths on families who have lost mothers, wives, daughters, and children to tobacco-related disease, the average annual productivity costs of these deaths are estimated by the CDC to be $33 billion.[9]

Smokers Underestimate Risk and the Addictiveness of Nicotine

While the vast majority of women today know that smoking is harmful to their health, many fail to fully understand the risks smoking poses to themselves, their families, and their children. For example, although lung cancer has been the leading cause of cancer death among women since 1987,[7] a Legacy study shows that 80 percent of women in the United States mistakenly believe that breast cancer is the primary cause of cancer death among women.[10] Furthermore, girls and young women overestimate their ability to quit smoking; survey data show that more than half of teens who currently smoke do not expect to be smoking in 1 year.[7] Unfortunately, tobacco is highly addictive, so while most smokers—including teenage girls—report wanting to quit, very few are successful in a given year.[7,11] One study showed that, among girls who smoked, 60 percent of those in middle school and 58 percent of those in high school had tried and failed to quit smoking during the previous year.[7] Survey data show us that of the approximately 43 million smokers in the United States, the majority of whom report wanting to quit, fewer than 5 percent will successfully quit within a 1-year period.[1,11]

The State of Cessation Interventions

In recent years, the science related to smoking cessation has advanced markedly; a combination of pharmacotherapy, counseling, and social support can vastly improve a smoker's chances of successfully quitting.[12] Based on evaluations of mass media cessation efforts in California, Massachusetts, and Oregon—in which high-intensity, research-based, paid media campaigns were combined with excise tax increases and community and school-based programs—the Task Force on Community Preventive Services "strongly recommends" mass media campaigns to increase tobacco cessation when the media campaign is combined with other interventions.[13] However, recent research suggests that many mass media interventions, which have been successful overall, have in fact done a poor job of reaching those most in need—disadvantaged and low socioeconomic status smokers.[14,15,16] Greater attention must be paid to 1) developing interventions that will influence smoking cessation within these high-risk populations, including women; and 2) evaluating interventions in such a way that overall program success does not mask failure to influence important subgroups.

The Tobacco Industry Encourages Smoking Among Women

It is worth bearing in mind that the cessation interventions of the tobacco control and public health communities are continually undermined by billions of dollars worth of tobacco industry marketing and promotion. Just this week, the American Cancer Society Cancer Action Network, American Heart Association (AHA), American Lung Association (ALA), Robert

Wood Johnson Foundation (RWJF), and Campaign for Tobacco-Free Kids released a report called, "Deadly in Pink: Big Tobacco Steps Up Its Targeting of Women and Girls."[17] The report describes how two tobacco companies—Philip Morris and R. J. Reynolds—have recently "stepped up" tobacco marketing directed toward women and girls, threatening to undermine the advances made in recent years by the tobacco control and public health communities. The report describes two new products: Philip Morris' Virginia Slims "purse packs," released in October 2008; and R. J. Reynolds' "Camel No. 9" released in January 2007. The report concludes that, given the aggressive marketing of these new products, these tobacco company efforts could be "devastating" to smoking initiation rates among girls and ultimately to women's health.

A separate study conducted by American Legacy Foundation indicated that after the first 6 months of the Camel No. 9 marketing campaign, more than 40 percent of youth (12–17) and young adult (18–24) smokers had tried the product and that many more planned to try it. Furthermore, interest in trying Camel No. 9 was high even among young adults who were not current smokers, suggesting that the product may serve to lure new smokers (Legacy data available upon request).[18] Given these emerging female-oriented tobacco products and marketing efforts, combined with the enormous promotional budget of the tobacco industry—$13 billion in 2005, the most recent data available[19]—it is of paramount importance to track the impact of these products on initiation, smoking, and quit rates among girls and young women.

Setting a Research Agenda for Women and Tobacco Use

The authors of the 2001 Surgeon General's Report on Women and Smoking set a research agenda to "build the science-base on gender-specific outcomes and on how to reduce disparities among women."[7] Moreover, the American Legacy Foundation has noted gaps in the research that have emerged since the time of the 2001 report. The following are presented as specific areas of research that Legacy believes should be pursued by the NIH ORWH in an effort to improve the health of women in the United States:

1. Conduct research to better understand why so many mass media cessation campaigns have been less effective or ineffective among disadvantaged or lower socioeconomic status populations
2. Conduct research to learn how new media and Internet cessation services can be used to increase smoking cessation among women, and whether they can be effectively used across the socioeconomic spectrum
3. Conduct research regarding smoking rates, smoking patterns, cessation rates, and factors associated with initiation and quit success among high-risk populations such as gay, lesbian, bisexual, and transgender individuals; minority racial/ethnic populations; population groups targeted by the tobacco industry; and lower education/lower income population groups
4. Conduct research regarding tobacco products designed for and marketed to women, specifically, whether they vary significantly in terms of the levels of known carcinogens and how this relates to lung cancer histology

5. Conduct research to further explore the link between smoking and health outcomes among women, such as breast cancer and reproductive outcomes
6. Conduct research to better understand how secondhand tobacco smoke impacts women who do not smoke
7. Encourage scientists to report gender-specific results whenever possible, when reporting on research about factors that influence smoking initiation or cessation, the health effects of tobacco, and new tobacco products

Considering the toll of tobacco use on the health of American women, research into tobacco and tobacco-related diseases is underfunded. There is still much we need to learn so that we can prevent youth initiation, help adult smokers quit, and deliver care to women who suffer from tobacco-related disease.

The American Legacy Foundation is a national, independent public health foundation created in 1998 out of the landmark Master Settlement Agreement ("MSA") between the tobacco industry, 46 State governments, and 5 U.S. territories. Our mission is to build a world where young people reject tobacco and anyone can quit. Legacy does not lobby or take positions on specific legislation. Our programs include the following:

- EX®—A groundbreaking and innovative smoking-cessation public education campaign designed to help smokers "relearn" life without cigarettes
- truth®—A national youth smoking prevention media campaign cited as contributing to significant declines in youth smoking.
- Research Initiatives—Examining how public health public education can reduce smoking initiation and prompt smoking cessation
- Outreach to Priority Populations—Targeted outreach to underserved and minority communities using methods that are culturally competent and tailored to improve the reach and retention of programmatic efforts

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LORI KARAN, M.D., PACP, FASAM

American Society of Addiction Medicine

Women and Addiction: Research Needs

Introduction

The American Society of Addiction Medicine (ASAM) is composed of approximately 3,000 physician members from all medical specialties and subspecialties. We are primarily clinicians caring for patients, but we also represent the interests of public health. We are often advocates for those who suffer from addiction because these persons are not often able to speak out for themselves. Our goals include improving access to and the quality of addiction treatment; educating physicians, healthcare providers, and the public about addiction medicine; and supporting research and prevention in this field.

The American Society of Addiction Medicine is pleased to contribute research priorities on "Women and Addiction" to the Office of Research on Women's Health. Organized under the categories of neurobiology, prevention, treatment access, services to improve treatment outcomes, and special topics (psychiatric comorbidity, eating disorders, pain, prescription drug use, and the criminal justice system), the concepts in this compendium have been selected for their impact and timeliness. Following a brief background, examples of research questions are given for each of the issues.

The Neuroscientific Basis of Addiction in Women

There are permanent sex differences in the structure and responsiveness of the human brain, including those that influence perception, cognition, and responsivity to stress. Sex differences occur due to the actions of gonadal hormones during early development, puberty, and pre- and postmenopausal adult life.

Sex hormones may have genomic and nongenomic effects. For example, androgens and estrogens not only regulate the expression of specific neuropeptides and neuropeptide receptors,

but they may also more directly influence neurotransmission such as by directly facilitating the opening of the GABA-benzodiazepine receptor chloride channel. Understanding gender's influence on neurobiologic mechanisms can help us better understand women's vulnerability to alcohol, nicotine, and other chemical addictions, as well as the factors that predispose to relapse. Improved knowledge of these mechanisms can lead to more specific interventions for gender-specific prevention and treatment of chemical dependency.

Examples of research questions on this topic include the following:

- What are gender-specific genetic and epigenetic influences, risk factors, and protective effects for addiction in women?
- What are the hormonal and neurologic influences on the developing and adolescent brain that predispose to drug experimentation? How do these influence risk taking, novelty seeking, and judgment in adolescent women, as well as in women at other stages of life?
- How might gender-related differences in the hypothalamus-pituitary-adrenal axis and/or in the regulation of beta-endorphins (or other neuropeptides) influence stress reactivity and relapse to drug use? Can we better tailor treatment interventions based upon this understanding?
- Are there certain opportunities based upon timing in the menstrual cycle when a woman is more vulnerable to drug use or when she is more likely to invoke therapeutic action and behavioral change? In particular, what are the effects of disordered cycling on drug experimentation and continued use?
- How do hormonal effects upon the GABA benzodiazepine receptor influence individual sensitivity to the psychoactive effects of specific drugs?

Preventing Substance Abuse and Dependence in Women Across the Lifespan

Prevention activities may be universal (designed for the general population), selective (designed for groups at higher risk of subsequent addiction, such as children of alcoholics), or indicated (designed for persons who are displaying behaviors etiologically linked to problematic substance use)[1] and may take place on an individual basis, within the family, at a school, in the community, or at the workplace. Prevention activities exist for many health conditions even when the etiology of the illness is not fully understood.[1] By targeting risk factors known to be associated with an illness, the public health system can promote prevention via a risk reduction model. However, in contrast to illnesses such as heart disease, this model has not been applied to addiction prevention despite scientific evidence of risk factors associated with addiction.[2]

Drug Use Trajectories Across a Woman's Lifespan

A woman's susceptibility to abuse and addiction of alcohol, nicotine, and other mood-altering drugs varies according to her developmental stage. A life-course perspective can guide new research and approaches to the prevention and treatment of drug dependence.

Examples of research outlining some, but far from all, of the questions focused per life stage include the following:

Perinatal Effects of Drug Use

- What are the effects of nicotine, alcohol, and specific other psychoactive drugs in utero on the developing brain? How might these changes influence future vulnerability of the neonate to the use of these drugs?
- Vaccines for nicotine, cocaine, and other drugs are being developed. The mechanism is to alter the substance before it crosses the blood–brain barrier so that it is neither psychoactive nor reinforcing. Might passive vaccination be indicated in pregnant women to prevent drugs from crossing the placenta?
- How might prevention programs be tailored for newborns and infants who have a parent with alcohol, nicotine, or drug addiction?

Childhood

- What interventions are most effective in preventing erratic parenting, child abuse, and neglect? In addition to improving psychological functioning of these children, do these interventions prevent addiction or alter the course of drug use in at-risk individuals?
- What qualities of parenting and healthy family function best protect against vulnerability to drug experimentation? What environmental and internal factors are associated with resiliency in female children at risk of substance misuse? How can these factors be amplified via prevention efforts?

Adolescence

- What type of interventions and systems can be put into place to effectively prevent alcohol, nicotine, and drug use by female teens who are at high risk for addiction?
- Why is the gender gap (male > female) in initiating alcohol and drug use diminishing? Do public health interventions to diminish alcohol and drug experimentation in the general population (such as increasing cost or altering social acceptability) affect teens differently by gender?
- What is the relationship between reproductive behaviors (sexual debut, contraceptive use, unplanned pregnancy, and abortion) and addiction? Given that prevention of alcohol and drug addiction results in fewer sexually transmitted diseases and unplanned pregnancies, how might this best be accomplished and evaluated?

Pregnant and Parenting Women

- The majority of women decrease or stop drug and alcohol use during pregnancy (unfortunately only to resume at prior levels after delivery). What are the factors associated with successful behavioral change during pregnancy? How might these be marshaled for general preventative efforts?
- How can the child–parent relationship be strengthened through prevention efforts?

- Many public health interventions aimed at adult women focus on reproduction. What are specific prevention interventions for lesbian women and those who choose to forgo childbearing?

Postmenopausal Women and Geriatric Women

- How do changes in estrogen levels and lack of estrogen affect mood and drug use?

Treatment Access

Improving Access to Drug and Alcohol Treatment for Women

Women face unique barriers in both accessing care and remaining in treatment. These barriers exist at the level of the individual (fear of separation from children and/or loss of child custody, stigma, lack of financial resources, greater problem severity and complexity, medical and psychiatric comorbidities, lack of safe drug-free housing, lack of transportation); at the level of the treatment facility (long waiting lists, lack of child care); and at the level of the provider (lack of knowledge about women and addiction).[3,4]

Examples of research questions include the following:

- What is the current treatment capacity for women in the United States? Is it sufficient to meet treatment need/demand?
- What are cost-effective means of reducing barriers to treatment for women in general, and specifically for minority women?
- What strategies can be initiated during the time waiting to enter treatment and how do these strategies improve engagement in treatment and treatment outcome?
- How can linkages to specialized addiction treatment and longer term recovery support be facilitated given that women are more likely to seek help for alcohol and drug problems in mainstream health care and counseling agencies?

Improving Access to Treatment for Family Members: A Systems Approach

Our current system for addictions treatment and reimbursement focuses upon acute intervention for a specified patient. However, professional intervention, education, and support for family members (including nontraditional family structures) of those suffering from addiction can result in an even greater benefit. A functional family system can alleviate the stress of its members, and reduce the continuation of intergenerational trauma. Healthy partners, families, and social networks can enhance an individual's motivation for treatment and continued recovery.[5]

- What are the long-term costs and benefits for a systems approach to addiction?
- Might there be increased incentives for family intervention in a system of universal health care?

Improving Drug and Alcohol Treatment for Women

Gender-Responsive Services To Improve Outcomes

Interest in providing treatment services specific to women began in the 1970s, but there remain many unanswered questions about what is essential. Research is challenging because it is difficult to disentangle the elements that work. Models for gender-responsive treatment often do not lend themselves to rigorous research designs because of their complex composition. However, there are many identifiable issues:

- What is the importance of providing practical assistance (transportation, child care, homework help) in fostering treatment engagement and retention?
- What features of clinical programming are important? Are women-only programs the most effective, or do women do as well when women-specific components are added to a mixed program?
- Having female role models is often cited as important, but what is the contribution of positive male role models (on staff) to good outcomes for mothers as well as their children?
- What modifications are needed to address variations in cultural background and sexual orientation?
- What interventions/forms of assistance encourage programs to serve pregnant women?
- How can programs best serve the children of the primary patient, to make best use of the prevention and early intervention opportunities that arise?
- What gender-specific long-term outcome measures (emotional and relational health; life meaning and purpose; social contribution) can best measure recovery, and how can these be utilized to further continuing support and care?

Special Topics

Psychiatric Comorbidity

It is well documented that substance-abusing women have high levels of psychiatric comorbidity,[6] particularly mood disorders, anxiety disorders (especially posttraumatic stress disorder), eating disorders, and borderline personality disorders. Clinicians widely agree that it is best to integrate treatment for co-occurring disorders, if possible, at a single site, utilizing physicians familiar with addiction medicine. Key questions include the following:

- How accessible is screening, assessment, and treatment for both substance abuse and psychiatric disorders, regardless of where women enter the healthcare system?
- How can assessment and treatment be made more accessible, given that many substance users do not have insurance and hence will not benefit from parity?
- What are the important gender differences in response to psychotropic medications, especially those originally studied in predominantly male samples?

- What modifications of currently accepted evidence-based practices (e.g., cognitive behavioral therapy, motivational enhancement therapy) augment their effectiveness in women with co-occurring disorders? For example, is it preferable to start cognitive behavioral therapy after a woman has been stabilized on antidepressants, as her brain reward system will be more responsive?
- What are the most important combinations of medications and psychosocial interventions? For which disorders?
- What are the most cost-effective treatment interventions?
- What are the most potent interventions for women who are the recipients of physical and sexual violence, in childhood and adulthood?

Eating Disorders

Anorexia, Bulimia, and Binge-Eating

- Are there effective ways to prevent anorexia and/or bulimia? Do such interventions alter drug experimentation or the course of drug use in at-risk individuals?
- Despite the high prevalence of co-occurring substance use and eating disorders, most addiction treatment programs do not address eating disorders either through assessment or treatment.[7] Using standardized assessment tools, what is the prevalence of eating disorders in women with substance use disorders? What treatments for eating disorders are most effective in this population?

Obesity: An Emerging Women's Issue

There is a growing epidemic of overweight and obese women. Obesity is a chronic condition, reflecting "nonhomeostatic eating" or eating without caloric need. Many overweight women are emotional eaters who report increased intake after stress. Even when they are not hungry, they report an inability to overcome cravings for highly palatable food when this food is omnipresent and easily available. It is important to understand how similar compulsive eating is to drug addiction, which may offer clues to treatment and prevention of obesity, as well as insights into drug addiction psychobiology.

Examples of research questions on this topic include the following:

- What are the sociologic, environmental, behavioral, and neurobiological similarities between overeating and drug addiction?
- Under what conditions do foods rich in carbohydrates and/or fats stimulate the reward center?
- How do dopaminergic, opioid, cannabinoid, and other neuropeptide pathways trigger overeating, especially after stress?
- Does volitional restraint from palatable foods (common to dieters), and life stress sensitize a woman's biology, leading to the higher reward value of palatable food?

- What is the preferred treatment goal for nonhomeostatic eating since complete abstinence from food is untenable?
- What treatment modalities lead to an optimal outcome?
- What dose and frequency of continuing intervention is needed to prevent rebound weight gain after weight loss?

Pain in Women

Women experience pain differently then men. In particular, they have lower pain thresholds, higher pain ratings, and less tolerance for pain. Additionally, both visceral pain syndromes (such as irritable bowel and interstitial cystitis) and chronic pain syndromes (such as fibromyalgia and chronic pelvic pain) are more common in women. The prevalence of chronic pelvic pain is comparable with that of asthma and is the single most common indication for referral to a gynecologist. Although addiction and chronic pelvic pain are comorbid conditions, little research to date has explored this relationship.

Examples of research questions on this topic include the following:

- Why is opiate therapy more likely to fail in the treatment of chronic pelvic pain compared with other pain syndromes?
- What role does sexual abuse play in modulating the association of addiction with chronic pain?
- What is the relationship between self-medication for pain syndromes and gender?
- How does the hormonal milieu contribute to the immunologic basis for specific rheumatologic illnesses and chronic pain syndromes in women? What are the implications of this pathophysiology for the effective medical management of pain?

Women's Nonmedical Use of Prescription Medication

There is an epidemic of prescription drug abuse in the United States. Women seek medical care more often than men and are more likely to be prescribed medications for a variety of symptoms, including pain, mood disorders, and insomnia. The nonmedical use of prescription drugs in women has been associated with a lifetime history of post-traumatic stress disorder, use and abuse of other substances including alcohol, as well as a history of drug- or alcohol-facilitated rape.[8] Some women use stimulants to suppress weight and/or to give focus and energy to completing a task.

- How is the nonmedical use of prescription medication different in rural and urban areas? How might prevention efforts and therapeutic interventions be tailored based upon these differences?
- How can prescribing practices for pain, anxiety, depression, and attention deficit disorder optimize functional outcome while minimizing the potential for abuse?
- Can effective drugs for weight loss and pain be developed that are less prone to abuse?

Women and the Criminal Justice System

Criminal justice system clients are an increasing proportion of admissions to substance abuse treatment, and women are the fastest growing population in the criminal justice system. Most are parents of multiple children. Although specific services continue to be developed to meet their needs, there is much to be learned about how to use resources effectively.[9] Although successful models for collaboration exist, the corrections emphasis on safety and control often conflicts with the principles of effective treatment for substance abuse problems. The following applies to incarcerated populations and those in the community on probation, parole, or with some other criminal justice system involvement.[6] Questions include the following:

- What are the key access barriers to obtaining physical and mental health services for women in these settings?
- What are the most common medical problems for incarcerated women?
- What are the most common psychiatric problems for incarcerated women?
- What is the quality of the health care they receive for these problems?
- What are the successful interventions/programs for reducing the negative consequences for the children of incarcerated mothers?
- What are the key elements of gender-responsive treatment for female offenders that reduce recidivism as well as alcohol and other drug use?
- What are the distinctive impediments to implementing effective treatment within the criminal justice system? How does the "corrections culture" conflict with substance abuse treatment principles?
- What are the successful models for treatment and criminal justice collaboration?
- How can employment barriers be reduced for women with a criminal justice history?

Conclusion

Preventing and treating addiction in women in all life stages has important biological, psychological, financial, social, and cultural consequences. Research advances are necessary but insufficient to improve public health. The links among basic science, epidemiology, systems of prevention and care, and support for wellness and recovery need to be streamlined and strengthened.

The focus of this paper has been to emphasize those research topics that have the potential for the greatest impact. Given scarce resources, it is most important to know what works, and what components of assessment, prevention, and treatment are most efficient and cost effective.

The American Society of Addiction Medicine is grateful for the opportunity to contribute its research priorities on addiction and women to improve the future of women's health.

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Joan Zweben, Ph.D.; and Mishka Terplan, M.D., M.P.H., also contributed to this testimony.

KATHLEEN BESINQUE, PHARM.D., M.S.ED.

Association of Reproductive Health Professionals

Recommendations From the Pharmacy Profession on Priorities for NIH Related to Reproductive Health

My name is Kathleen Besinque. I am an Associate Professor of Clinical Pharmacy at the University of Southern California School of Pharmacy, a practicing pharmacist in women's health care, and a member of the Board of Directors for the Association of Reproductive Health Professionals (ARHP). Thank you for the opportunity to speak to the Office of Research on

Women's Health as you explore women's health research priorities for the NIH for the coming years. As a leader in providing evidence-based interdisciplinary educational programming in broad areas of reproductive and sexual health, ARHP is trusted by healthcare professionals. Pharmacists are the fastest growing membership category for ARHP.

I am speaking today to encourage the NIH to prioritize investment in the following areas:

1. Research: Research is needed to evaluate the effects of the environment on reproductive health—Research into safety, toxicology, and most appropriate methods for discarding unused chemicals, including medications by consumers.

2. Education: There is not enough curricular time in pharmacy education to cover all the topics that could/should be included in the Doctor of Pharmacy programs. There are significant gaps in the coverage of women's health in general across the curricula within pharmacy education and there is little to no coverage on the topic of the environment and its impact on women's health or reproductive health.

3. The role of the pharmacist in providing health education is often under appreciated. Pharmacists are the "most accessible" healthcare professionals in the community—no appointment is needed to see a pharmacist and there is no charge to ask the pharmacist for advice. The pharmacist may, for many, be the first point of contact in the healthcare system, especially for those with limited access to the healthcare system who may visit a pharmacy seeking self-care remedies or advice. There is a pharmacy in almost every town, including rural environments where the effects of toxins, including pesticides, pose significant health risks to their communities. There is also a need for educational programs, including programs for students and practicing professionals, to support all of the members of the healthcare team in their efforts to educate their communities.

4. Policy reform in the area of chemical safety: A pharmaceutical company is not able to promote a product for use in pregnant women without controlled studies demonstrating both efficacy and safety. All FDA-approved medications must contain in their product labeling a clear statement indicating if the drug has been studied in pregnant women and the outcome of those studies. This statement reminds everyone of the importance of determining the reproductive effects of a medication. Lessons from DES, Thalidomide, and Accutane have taught us about the effects of chemicals when taken by pregnant or soon-to-be pregnant women.

In summary, I join in support of ARHP as a representative of the team including nurses, pharmacists, physicians, PAs, educators, and scientists in urging that the NIH prioritize the following:

1. Development, evaluation, and dissemination of evidence-based, accredited reproductive environmental health educational resources that meet the current training and practice gaps in reproductive environmental health education and clinical care

2. Support for chemical policy reform that restricts chemicals known to cause harm and invests in green chemistry that will provide safer alternatives that will protect the public's health and the health of future generations

SUZAN GOODMAN, M.D., M.P.H.

Association of Reproductive Health Professionals

Testimony To Be Presented to the NIH Office of Research on Women's Health by Suzan Goodman, M.D., M.P.H.

My name is Dr. Suzan Goodman. I am a family and emergency physician; a UCSF faculty member; and Director of the TEACH Program, which integrates reproductive health curriculum into a number of Bay Area primary care residency programs. Today I am speaking to you as an active member of the Association of Reproductive Health Professionals (ARHP). I work with ARHP because it is a leading source of trusted education and information on reproductive health issues, and it supports first-rate science informing clinical decisionmaking across the entire healthcare team.

After seeing multiple patients in the emergency department for respiratory problems following a particularly heavy pesticide spray in a nearby agricultural community, I was spurred to look more deeply into what is known about such exposures. Two of those patients were pregnant women, also concerned about risks for developmental and birth outcomes. What I learned is that even for pesticides with known deleterious effects such as atrazine, lindane, and endosulfan, there are limited mechanisms in place to track, study, or control related exposures. I also learned that as healthcare professionals, we do not have nearly as much data on pesticide health effects as we need to make the best recommendations to our patients.

I started educating myself and my colleagues about endocrine-disrupting chemicals in common use, including pesticides, brominated flame retardants, heavy metals such as lead and mercury, and plastic components such as phthalates and bisphenol A. As a physician deeply committed to the scientific process, I know that we do not have the kind of time that it took for the DES exposure story to unfold, waiting for definitive proof of significant harm before taking action. As you know, our lessons from DES included that the placenta is a limited barrier, and that maternal exposures can have unexpected, delayed effects in offspring. I quickly learned why the absence of definitive evidence of cause-and-effect does not necessarily indicate absence of harm.

Ethical concerns prevent us from ever being able to conduct randomized double-blind control trials on pregnant women to learn about health effects of suspected endocrine disruptors. Yet further research is needed. While the Centers for Disease Control and Prevention collects biomonitoring data on some 200 chemicals and their persistence in the body, these studies have not, to date, gathered data on amniotic fluid, cord blood, and breast milk. Additional data are needed on low-dose effects, combined effects of multiple chemicals and their cumulative impacts, and critical windows of exposure among vulnerable subpopulations.

Under our current Toxic Substances Control Act (TSCA), tens of thousands of chemicals have been deemed "innocent until proven guilty," with the burden of proof of harm primarily falling on the Environmental Protection Agency (EPA). The standard of evidence is set high enough that this burden of proof has been all but impossible to meet, as is illustrated by the EPA's inability to prohibit the use of known hazards such as asbestos. The fact that TSCA does not

require the development of chemical hazard data ensures that scientific uncertainty will persist. In the face of such uncertainty and credible threats of harm, I join the ARHP in strongly supporting both a call for further research and, meanwhile, action based on the Precautionary Principle, which suggests that "when activity raises threats of harm to human health or the environment, precautionary measures should be taken, even if some cause-and-effect relationships are not fully established scientifically."

In summary, my recommendations to the NIH Office of Research on Women's Health are as follows:

1. Increase research on low-dose effects, cumulative impacts of multiple chemicals exposures, and critical windows of exposure among vulnerable subpopulations
2. Expand biomonitoring of pregnant and breastfeeding women, newborns, and children under 6 years of age
3. Develop educational resources for training clinicians to understand the science required to help reduce patients' exposures to chemical hazards
4. Require that chemical safety evaluations take into account the entire body of research (including studies by nonindustry-based researchers)
5. Develop and support policies based on the Precautionary Principle in the absence of scientific certainty when taking any action that will affect public health, particularly with regards to exposures to women, infants, and children

RIVKA GORDON, M.H.S., PA-C

Association of Reproductive Health Professionals

Incorporating Reproductive Environmental Health Into Reproductive Health Education and Advocacy

My name is Rivka Gordon. I am a primary care physician assistant (PA), a women's healthcare specialist, and the director of strategic initiatives with the Association of Reproductive Health Professionals (ARHP). Thank you for the opportunity to speak to the Office of Research on Women's Health as you explore women's health research priorities for the National Institutes of Health for the coming years. For nearly 50 years, ARHP has established itself as the leading source for trusted medical education on reproductive and sexual health. On behalf of its 11,000 members, ARHP applauds the renewed commitment to develop priorities based on sound science and the fundamental value of scientific integrity.

ARHP members represent the full healthcare team, physicians, nurses, nurse practitioners and midwives, PAs, pharmacists, scientists, and educators who provide reproductive health services, educate clinicians, conduct research, and influence policy. ARHP provides evidence-based programs on all that is current and urgent in reproductive health. ARHP defines reproductive health broadly and incorporates emerging science into its educational and policy activities. We have taken a leadership role in introducing reproductive environmental health science to the reproductive health field.

The emerging science that links reproductive health outcomes to environmental exposures is compelling and must be incorporated into reproductive health education and clinical practice. However, healthcare training programs, whether they be in medicine, nursing, pharmacy, or health education, are woefully deficient in any content that relates to the link between reproductive health and environmental exposures.

Patients ask their clinicians about the safety of plastic baby bottles, whether to eat fish while they're pregnant, and if their breast milk is toxic. Clinicians are challenged to understand the causes of reduced fecundity, early pregnancy loss, and pubertal development in very young girls. They are unsure of the best course of action in the absence of clinical guidelines that can take years to develop. All this is complicated by the assumption that animal data do not translate to human health outcomes and have limited application to patient care.

To enable the reproductive health field to address these challenges, ARHP urges the NIH to prioritize investment in the following:

1. Research that identifies gaps in clinicians' critical assessment skills that limit their ability to integrate reproductive environmental health science into clinical practice. Ethical concerns prevent scientists from conducting randomized, double-blinded, placebo-controlled studies on women and children, exposing them to chemicals that show clear toxicity in animals. But the absence of evidence based on human randomized clinical trials does not mean absence of evidence of harm. Clinicians need the ability to assess the strength of the scientific literature, but a gap has been documented over the past decade showing that providers are not receiving critical appraisal skills training in undergraduate and graduate education.[1,2] Because reproductive environmental health data are derived differently, this deficit in appraisal skills is particularly relevant. We need research that will identify the multitiered training and knowledge gaps that must be addressed to accomplish the full integration of environmental health into reproductive health care.

2. Based on this research, ARHP urges an investment in effective, innovative, accredited educational programs that train the full range of healthcare professionals in critical appraisal skills so that they can guide their patients and help them to navigate the constant barrage of inaccurate, confusing, and often sensationalized information on health risks from the food they eat, the water they drink, the pharmaceuticals they take, the products they use, or the air they breathe.

3. Success of these educational programs depends on evaluation of various training and educational modalities for their effectiveness in implementing change in clinical practice. Building on adult-learning theories, ARHP recommends developing and disseminating interactive, Web-based educational programs on reproductive environmental health and comparing the practice change outcomes with more traditional methods of learning. As a pioneer in Web-based educational programs, ARHP believes that reproductive environmental health topics are particularly suited to Web-based state-of-the-art modalities. The Web provides the potential for reaching a greater number and more diverse cross-section of the healthcare field. It permits educational sessions to be

targeted to providers caring for patient populations that are impacted by particular environmental exposures. The Web has potential for creating networks of providers that can share knowledge and experience and, thereby, enhance patient care.

4. And finally, as advocates in support of a healthy environment that provides women and men with the best opportunity to have a healthy child when and if they decide to do so, ARHP urges the NIH to support chemical policy reform and shift the "burden of proof" to the chemical manufacturers to demonstrate the safety of their products. Neither patients nor their healthcare providers can or should be expected to simply avoid exposures that might affect their health or the health of their families but are everywhere in their homes, schools, communities, and work places. ARHP joins with our environmental health colleagues to urge the NIH to support basic and applied research into green chemistry and to underscore the necessity of requiring industry to thoroughly test all chemicals, provide information on health hazards, and phase out persistent bioaccumulative toxicants. These "upstream" measures will provide support for a reproductive healthcare team that is educated about the effects of endocrine-disrupting chemicals and is motivated to improve the health and well-being of the families they care for.

In sum, ARHP represents the reproductive health team including nurses, pharmacists, physicians, PAs, educators, and scientists in urging that the NIH prioritize the following:

1. Development, evaluation, and dissemination of evidence-based, accredited reproductive environmental health educational resources that meet the current training and practice gaps in reproductive environmental health education and clinical care

2. Support for chemical policy reform that restricts chemicals known to cause harm and invests in green chemistry that will provide safer alternatives that will protect the public's health and the health of future generations

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JOYCE BICHLER M.S.W.

Breast Cancer Action

Differences in Incidence and Mortality: Reducing Inequalities in Cancer

Disparities—differences—in breast cancer incidence and mortality between and among different racial and ethnic groups are well documented. Social, political, and economic inequities play an important role in these differences, yet they are mostly ignored in discussions and research about breast cancer in different communities.

Social Determinants of Health

While considerations of the social determinants of health are beginning to emerge in a number of health fields, the cancer world still focuses on genes and differences in screening patterns. Thus, while many people in public health understand that we can reduce the burden of asthma by focusing on the physical environments in which people live, the conversation in cancer focuses on the biological differences between people, or differences in personal behavior.

For example, a recent study that focused on teenage girls showed that regular physical activity may reduce their risk for breast cancer later in life. A resulting news article admonished readers to "get your daughters off the couch." Similarly, studies have shown an increased risk for breast cancer in postmenopausal women who are overweight.

While these types of studies point to what might be done to reduce breast cancer risk, they miss the larger context of the social, economic, and historical reality in which many people lead their lives. The choices people make are shaped by the choices that are available to them.

A healthy diet and regular exercise are important for all of us, but they are about far more than self-discipline. Some neighborhoods have easy access to healthy and organic foods; others have only fast food restaurants and liquor stores nearby. Some communities have safe streets and green environments in which to run and play, while others are unsafe to walk even during the daytime. Some have safe housing with minimal exposure to environmental contaminants, while others are near toxic release sites or live in communities built with cancer-causing materials. Like the hazardous waste facilities, these neighborhood differences follow a pattern. They reflect communities with differences in race and income.

Breast Cancer Action (BCA) knows that differences in breast incidence and outcomes are about far more than lifestyle choices and biology. BCA has changed many conversations in breast cancer, and we must change this one, as well, so that people understand the social justice lens through which breast cancer needs to be seen and studied so that we eliminate the differences in breast cancer outcomes that affect different groups of people.

Therefore, BCA aims to change the focus of discussions and research on inequities in a way that does not lead to racial or genetic stereotyping or marginalizing of affected groups.

JOYCE BICHLER M.S.W.

Breast Cancer Action

Environmental Health Issues: Reducing Individual Risk and Preventing Breast Cancer in Populations of People

The primary prevention of breast cancer means taking steps to keep breast cancer from ever developing. Breast Cancer Action (BCA) believes that the primary prevention of breast cancer in populations of people, and the reduction of the risk of breast cancer in individuals, must focus on identifying and eradicating the involuntary environmental exposures that are

contributing to the increased incidence of the disease. Since no one can honestly promise to be able to prevent a single case of breast cancer by eliminating environmental triggers, we refer to breast cancer risk reduction in individuals, and prevention of breast cancer in groups of people by making the policy changes that will reduce exposures to environmental triggers of cancer. The "Stopping Cancer Where It Starts" initiative refers to these larger policy changes of reducing everyone's exposure to toxics and other cancer triggers, rather than personal changes made in hopes of keeping individuals from getting breast cancer.

Issues of lifestyle that can be controlled by individuals are important, but are not BCA's focus. We are concerned that this emphasis leads some women to blame themselves for getting sick. While it is laudable that others focus attention on healthy lifestyles, this information must be balanced with information on exposures that are outside a woman's individual control and can contribute to her risk.

A Precautionary Approach

There is already sufficient scientific information to warrant policy changes to reduce exposures of toxins linked to breast cancer. Where sufficient evidence exists that something used in the environment is contributing to the risk of cancer, the manufacturers or proponents must be required to either show that the danger does not exist or to use less toxic alternatives if they are available. The decisions about whether the exposure should be reduced or eliminated, and what alternatives to use, must be made with the input of the community affected by the exposure.

Balancing the Research Portfolio

While policy changes move forward, society needs to balance current research expenditures for treatment for those living with cancer now, and reduction of the risk of breast cancer in future generations. Current research funding is heavily focused on developing new treatments for cancer, leaving underfunded the research necessary to keep people from developing the disease. We don't necessarily need more funding for breast cancer research, but we do need to refocus how the available funds are spent.

Developing New Scientific Tools

Calling for more environmental research is not enough. Instead, we need research directed to developing tools that will allow us to link health outcome data to environmental exposure information. Health outcome data, as well as information on environmental exposures and their potential for contributing to breast cancer and other cancers, are becoming increasingly available. But we do not yet have the scientific tools necessary to link the exposure information to the health outcome data. This is where environmental research should focus now and into the future.

Addressing Underlying Causes, Not Substituting Diseases

BCA's approach to risk reduction is based on the premise that we must address underlying causes to truly reduce the risk of the disease, and that any pill powerful enough to reduce a person's risk of breast cancer is very likely to cause a different disease. Moreover, focusing on

the development of pills to "prevent" breast cancer diverts resources from the environmental research that is needed. We therefore oppose devoting resources to the development of pills to "prevent" breast cancer.

Many communities bear a disproportionate burden of environmental exposures, which has implications for their health and well-being. These affected communities are entitled to participate in decisionmaking on how to address these exposures. And the inequities that lead to this disproportionate exposure need to be addressed by the cancer community.

KASHA HO

California Healthy Nail Salon Collaborative/Breast Cancer Action

Ensuring the Health and Safety of Nail Salon and Cosmetology Workers: The Need for Workplace Toxic Exposure Research

My name is Kasha Ho'okili Ho. I am a Program Associate at Breast Cancer Action, and I'm here representing the California Healthy Nail Salon Collaborative. Breast Cancer Action (BCA) is an education and advocacy organization that carries the voices of people affected by breast cancer to inspire and compel the changes necessary to end the breast cancer epidemic. Nearly 20 years ago, BCA initiated the conversation to address toxic exposures and environmental links to breast cancer. Because of those early conversations, researchers and some mainstream breast cancer groups are now dedicating time and money to understanding those links.

Breast Cancer Action believes that it is not just genes, but social injustices—political, economic, and racial inequities—that lead to disparities in breast cancer outcomes. Discussions of the social determinants of health are beginning to emerge in a number of health fields, but the cancer world still focuses on genes and differences in screening patterns. So, while many people in public health understand that we can reduce the burden of asthma by focusing on the physical environments in which people live, the conversation in cancer focuses on the biological differences between people, or differences in access to breast cancer screening. We know there is more to it than this. BCA has changed many conversations in breast cancer, and we will work to change this one as well, so that people understand the social justice lens in which breast cancer needs to be seen and studied if we are ever to be able to change the differences in breast cancer outcomes that affect different groups of people.

BCA is a member of the California Healthy Nail Salon Collaborative (the Collaborative). We first collaborated in raising the concerns of toxic exposure among nail salon workers during the passing of the California Safe Cosmetics Act of 2005 (SB 484), of which BCA was a cosponsor. The California Healthy Nail Salon Collaborative was created in 2005 out of growing concern for the health and safety of nail salon and other cosmetology workers, owners, and consumers. The Collaborative uses policy advocacy, research, industry advocacy outreach, and education strategies to address health and safety concerns facing these communities. Our mission is to advance a preventative environmental health agenda for the nail salon and cosmetology sector in California.

The Collaborative's members include nail salon workers and owners, cosmetologists, nonprofit and community organizations focused on environmental and reproductive health/justice, labor and Asian-American community health, educational institutions, and government agency allies.

In California and throughout the United States, the beauty industry is booming. Over the past 20 years, nail salon services have tripled and cosmetology is now the fastest growing profession in California. Currently, there are approximately 115,000 nail salon technicians in California, and most are women of color. Of these women, 59–80 percent are estimated to be Vietnamese immigrants, and more than 50 percent are of childbearing age. Many nail salon workers can earn less than $18,200 a year and work in conditions that can be hazardous to their health.

On a daily basis, nail salon workers handle numerous solvents, glues, and other nail care products. These contain many chemicals known to and are suspected of causing acute and chronic illnesses, including cancer, respiratory problems, skin problems, and reproductive harm. There is very little State and Federal Government regulation of the chemicals used in these products. Also, little research has been done on the health issues that nail salon workers experience from long-term exposure to these chemicals. In fact, there are more than 10,000 chemicals used in personal care and nail products and yet 89 percent have not been tested independently for their impact on human health. Nail salon workers and other cosmetologists are at greater risk for health issues related to their work because of various challenges, such as language and cultural barriers and lack of access to health care. In addition, there is not enough culturally and linguistically appropriate education and outreach to this diverse population.

Through the California Healthy Nail Salon Collaborative, advocates are working together at the intersection of workers rights, women's rights, environmental and reproductive health/justice, and Asian-American community health to advance greater worker health and safety for this sector.

The California Healthy Nail Salon Collaborative has just produced a Report and Policy Agenda entitled, "Overexposed and Underinformed: Dismantling Barriers to Health and Safety in California Nail Salons." This report articulates policy goals and recommendations aimed at improving the lives of nail technicians and salon owners, as well as benefitting consumers of nail care services. These include the following:

- Improving access to occupational health and safety information
- Reducing or eliminating toxic exposures and other health hazards in nail salons
- Ensuring greater access to health care and occupational medicine

The full Report and Policy Agenda is available for download at http://www.cahealthynailsalons.org.

On April 27–28 of this year, the California Healthy Nail Salons Collaborative held a Research Convening in Oakland, CA, to set an agenda for "Protecting Worker Health and Safety in the Nation's Nail Salons." This groundbreaking event brought together, for the first time, more than 100 nail salon and cosmetology workers and owners, scientists, reproductive and environmental justice advocates, government representatives, policymakers, and community

and academic researchers from around the Nation to discuss the issue of occupational exposure to toxins in salons and identify priority areas of research needed to advance worker health and safety.

Funding for this Research Convening was provided in part by the Breast Cancer Research Project, as concerns exist regarding the possibility of increased rates of breast cancer and other reproductive health impacts associated with working in the nail salon and cosmetology industry.

Some of the research priorities identified at the Convening included the need for the following:

- Study of cumulative chemical exposure on nail salon and cosmetology workers in nail salons (Currently, thresholds for "safe exposure" to chemicals are not set at levels appropriate for women of reproductive age, which most salon workers are, or for women who are pregnant, and do not take into consideration the cumulative effects of constant exposure throughout the work day as well as the synergistic effects of exposure to multiple chemicals).
- Human health studies, descriptive data, and other research that examines chronic health effects related to nail salon and cosmetology workers' exposure to toxins in their workplace
- Studies of safer alternative products for use in nail salons
- Study of appropriate health and safety precautions in nail salons to protect worker and customer health, which includes improving air quality

A full report summarizing these findings will be available from the California Healthy Nail Salon Collaborative within the next few months.

Despite tremendous growth in the nail salon and cosmetology industry, I would like to emphasize that, to date, there are no published studies examining chronic health outcomes, such as birth defects, infertility, or cancers, specifically in nail salon workers. Advocates and scientists are increasingly calling for additional research. Biomonitoring projects, cumulative chemical exposure, indoor air, and longevity studies by specific health outcomes are all needed to address data gaps and advance an overall understanding of the health impacts associated with this sector's workplace exposures. Given the high level of concerns expressed by advocates, scientists, community members, and consumers alike nationwide, we, as the California Healthy Nail Salon Collaborative members, feel it is of utmost importance to ensure that the health and safety of nail salon and cosmetology workers, the majority whom are of reproductive age and female, has a place on NIH's women's health research agenda.

DEBRA BINGHAM, DR.P.H., RN

California Maternal Quality Care Collaborative

Improving the Quality of Maternity Care

Mainstream obstetrics and public health officials now acknowledge a growing and serious problem: The U.S. maternal mortality rate is steadily increasing after several decades of decline. No one is sure of the reasons why and case ascertainment does not adequately account for these worsening trends. In 2006, the Health Resources and Services Administration reported that the national maternal mortality rate was 15.1 per 100,000, or 84 percent higher than the rate reported in 1990 (8.2 per 100,000). Although actual numbers are small—4 million births per year translates into 623 women dying—maternal death is considered a sentinel event. For every death, 50–100 women suffer a severe morbidity, with an average of 5.1 hospitalizations.[1] Moreover, maternal complications were the fourth leading cause of infant death in 2005. The World Health Organization reported that the U.S. ranked 41st among developed countries for maternal deaths in 2005, despite spending $2 trillion on health care that year, 16 percent of the Nation's Gross Domestic Product.[2]

Efforts to address this alarming situation are underway. Maternity care advocates are turning their attention to quality improvement, essentially the implementation of evidence-based care.[3] This represents a new focus for obstetrics, compared to other medical specialties, such as neonatal intensive care, cardiology, or internal medicine, which have long had institutionalized systems for designing, measuring, and tracking specific data points to signal quality in medical care. One immediate challenge is to identify quality indicators of maternal health care that can be used for comparative and assessment purposes, such as the 17 perinatal measures the National Quality Forum recently adopted.

When population-level data are utilized to provide comparative assessments of healthcare quality, the findings illustrate large variations in medical practice. The Dartmouth Atlas Project is one such example, but their source of data, Medicare, does not allow for examination of birth trends. However, in our early analyses of obstetrical outcomes in California, we see large variation, at the hospital level, in rates of primary cesareans among low-risk women. These data highlight the possibility for changing medical practice to better reflect best evidence and yield more optimal outcomes for patients. As these data become available, many questions remain as to how they can be best utilized to inform change at the institutional level.

In California, our group is identifying compelling questions arising out of population-level data: Why are first-time, young, healthy Latina women who present in labor with a head down singleton more likely to experience labor induction, augmentation, and cesarean surgeries than other groups in one county? How is it that African-American women are more than three times more likely to die from obstetric hemorrhage, although they are not at greater risk prenatally than other racial/ethnic groups?

Clinicians are realizing that analyzing quantitative data is only the first step toward changing behaviors, and are acknowledging that healthcare culture drives much of this practice variation. Yet most clinician researchers are untrained in the methods best suited to discovering

how to maximize quality improvement efforts—ethnography and qualitative research. Clinicians whose careers have been dedicated to quality improvement in health care are increasingly aware of the value of such approaches. Donald M. Berwick (Institute for Healthcare Improvement) has argued for a wider embrace of methodologies beyond the "gold standard" randomized control trial, to assist quality improvement efforts in health care. In particular, he informs his clinical colleagues that approaches such as "ethnography, anthropology, and other qualitative methods … are not compromises in learning how to improve; they are superior."[4]

Clinicians (and maternity care advocates) have long relied on population data to make the case that evidence-based care can improve maternal and infant health outcomes. To do this, however, Berwick claims that clinician advocates, and the administrators and policymakers to whom they must answer, "need information on both mechanisms (i.e., the ways in which specific social programs actually produce social changes) and contexts (i.e., local conditions that could have influenced the outcomes of interest)."

Women's Health Research Opportunities

There is, therefore, an exciting and urgent opportunity for research on women's experiences of birth and especially among the women who experience adverse obstetric events to contribute to quality improvement in obstetrics. Outcome research using population variables is limited in its ability to shed light into clinicians' everyday obstetric practices or on the processes of care that women receive once admitted to the hospital. There has been little ethnographic study of hospital birth in the United States since Brigitte Jordan and Nancy Stoller Shaw's groundbreaking work in the early 1970s. In contrast, much social science research on U.S. childbirth has largely focused on the 1 percent of women choosing homebirth and their midwives, a number that has remained constant for more than 30 years. Focusing on edge cases leaves mainstream obstetrics and everyday practices in hospital birth unexamined. There have been very few ethnographic studies of more prevalent maternity care roles, such as doulas, childbirth educators, labor and delivery nurses, and obstetricians.

Improving childbirth outcomes in the United States will require thick description and earnest efforts to understand the cultures that have created current obstetric practices and the variation that exists within and between them. More than 99 percent of U.S. women are giving birth in hospital settings; without systematic ethnographic research findings, these women will not be fully informed on how obstetric care is delivered, in all its variation. Additional funding for systematic ethnographic research into local cultures of obstetric practice can help inform birthing women and clinicians, and work to improve the quality of care in childbirth.

Ethnographers are uniquely positioned with the tools to assess the gap between formal quality assessment measures and how work actually takes place by observing social interactions; indeed, we have long been doing this in other work settings. Reproductive researchers urgently need to turn their attention to the task of gathering systematic empirical data on everyday practices in labor and delivery units, in a number of hospital settings. We must begin talking to obstetricians, labor and delivery nurses, other hospital workers, and birthing women about their views of, and experiences with, hospital birth.

Summary of Recommendations

1. Ensure thorough examination at the national and local levels of both maternal mortality and morbidity trends
2. Develop a maternity-specific Atlas project to track variation in both processes and outcomes of care
3. Increase adoption of quality improvement indicators and enhance quality improvement leadership capacity at the frontlines
4. Increase research in culture and processes by funding ethnographic and other qualitative research on quality improvement work in maternity care

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HEATHER SARANTIS, M.S.

Commonweal
Women's Health and Environment Initiative

Thank you for the opportunity to speak today. My name is Heather Sarantis and I am the Women's Health Program Manager at Commonweal, a nonprofit organization based in Bolinas, CA. One of my roles at Commonweal is to coordinate the Women's Health and Environment Initiative, a national network of leaders in environmental health, environmental justice, reproductive health, and reproductive justice. We have been working to build bridges between our organizations in order to overcome the social, political, and scientific barriers to a healthier world.

Health problems and disabilities such as asthma, birth defects, cancer, diabetes, and infertility affect more than 100 million men, women, and children, or about one-third of the U.S. population. Scientific research shows that exposure to chemicals may increase a person's risk for these and other health concerns. Pregnancy and early childhood are especially vulnerable times, but exposure throughout our lives can be harmful.

We can be exposed to chemicals from household products, food, air pollution from vehicles or factories, hazardous waste sites, and other sources. Chemicals can be found in many homes, communities, schools, and workplaces.

With thousands of chemicals in use, more research is needed to understand how they affect human health. I am especially interested in research on links between exposure to chemicals and the impacts on pregnancy, fertility, reproductive health, and women's health.

We need better understanding of the cumulative effects of exposure to multiple chemicals. This includes low-level exposures from multiple sources, such as from everyday use of cosmetics, cleaners, and other consumer products.

We need research that supports better understanding of the disproportionate impacts of chemical exposure in the workplace.

We need a greater emphasis on community-based research, which is essential for improving our understanding of disproportionate impacts on highly exposed communities, especially communities of color, and vulnerable populations.

We need to expand and modernize our health and environmental tracking infrastructure so we can better understand and prevent environmental contributors to disease.

Finally, we also need to expand and modernize biomonitoring efforts that provide important information on what chemicals we are being exposed to across the population.

KARI CHRISTIANSON

DES Action USA

Prenatal DES Exposure: Research Needed for the Generations

Thank you to the National Institutes of Health, the Office of Research on Women's Health and the University of California, San Francisco for this opportunity to provide written testimony about the research concerns of almost 10 million diethylstilbestrol (DES)-exposed people in the United States.

For more than 30 years, DES Action USA has been advocating for individuals who were prenatally exposed to DES. DES Action is the national, nonprofit consumer organization dedicated to helping DES-exposed individuals with important health information, to informing the public and healthcare professionals about the health and fertility concerns related to DES, and to advocating for research about the health effects to all generations affected by exposure to DES.

Many terms that could be used to describe the DES-exposed population: the canaries in the endocrine-disruptor coalmine, the silent generation of infertility and reproductive tract cancer, the forgotten medical tragedy. But these limited descriptions carry the stories of real people who have suffered a range of health concerns, many of which have been ignored or dismissed by healthcare providers. Without the research efforts of the National Institutes of Health, this population would never have been studied at all.

It is with acknowledgement of what already has been learned from studying DES exposure that we advocate for renewed emphasis on DES research. There is still much that can be and needs to be learned about DES exposure, particularly as the research community continues to find increased risks for adverse health effects among DES Daughters and needs to assess real and potential health concerns of DES Granddaughters.

In the past few years, the National Cancer Institute DES Followup Study found an almost two-fold increase in breast cancer risk among DES Daughters over the age of 40, an increased incidence in uterine fibroids and paraovarian cysts, and a slightly earlier onset of menopause. These findings have been added to the small but lifelong risk for clear cell adenocarcinoma of the vagina or cervix; a higher incidence of neoplasia; and structure changes of the reproductive tract, including the vagina, cervix, uterus, fallopian tubes, and ovaries, which can adversely affect fertility, causing a higher risk for ectopic pregnancy, miscarriage, preterm labor, and infertility.

Research on the health effects of DES Granddaughters, another generation affected by the DES given to their grandmothers, is of great need now. Recent studies have indicated there may be some concern about overall fertility based on the delayed onset of menstrual regularity. Also, there was the troubling finding of several cases of ovarian cancer within the cohort of DES Granddaughters. These preliminary findings require more research, not only for this generation of the DES population, but also for researchers and the public concerned about all epigenetic exposures to hormonally active substances.

The DES-exposed cohorts of the National Cancer Institute are the best available populations for continued research into the effects of DES, the first known endocrine disruptor, and for understanding the health effects of generational exposures. The DES-exposed population of daughters and granddaughters provides the opportunity to understand developmental biology, emerging diseases and conditions that may affect women's health differently, and to address how research information can be and is translated to healthcare delivery.

Most certainly, for the DES-exposed population, "Moving Into the Future" means continuing to learn from this human tragedy, which has been and still is a vital and timely research opportunity.

BETSY RASMUSSEN

Endometriosis Association

Endometriosis, Toxins, and Reproductive Health

Organization Background

The Endometriosis Association is a nonprofit organization that exists to provide education and support to women and girls suffering from endometriosis and to conduct research to identify a cause and cure for the disease.

Endometriosis, Toxins, and Reproductive Health

Endometriosis is a disease of the endocrine and immune systems in which tissue similar to the endometrial tissue of the uterus occurs abnormally in other areas of the abdomen, causing pain, fatigue, intestinal upset, heavy or irregular periods, painful sexual intercourse, dizziness, headaches, low resistance to infections, and/or infertility. Infertility afflicts 30 to 40 percent of women with endometriosis and is a common result with progression of the disease.

Incidence of endometriosis, which was considered relatively rare even in the early 1980s, has been skyrocketing. Affecting at least 7.5 million women and girls in the United States and Canada, it afflicts millions more worldwide. Advances in diagnosis and reporting do not explain the current epidemic rates of endometriosis. Greater awareness fails to explain documented increased rates of hysterectomies due to endometriosis, most notably in teenage girls. It has been established, however, that endometriosis is a disease related to environmental toxins. In fact, it is one of the first diseases to be linked to persistent organic pollutants in humans. Since 1992, Endometriosis Association research findings have been showing that dioxins (chemicals that mimic hormones or cause other dysfunctions in the endocrine and immune systems) can cause the development of endometriosis.

There is also a growing concern that these same hormonally active chemicals are accelerating the onset of puberty. According to a recent study in the *Journal of Pediatrics,* girls in the United States are reaching puberty earlier than ever. Nearly half of African-American girls and 15 percent of Caucasian girls are beginning to develop sexually at the age of eight. The authors of the study called for more investigation into whether hormonally active chemicals are responsible for these findings. Results of a 1998 study by the Endometriosis Association revealed that the earlier the onset of endometriosis symptoms, the greater the length of time before diagnosis, the more severe the symptoms, and the wider the variety of symptoms young women experienced.

Endocrine disruptors can have other negative effects on the female reproductive system, as well, including increased risk of breast cancer, altered menstruation, decreased fertility, increased miscarriages, and early menopause.

Since 1999, the Endometriosis Association has partnered with the Vanderbilt University School of Medicine to fund and coordinate a team of scientists to research endometriosis. This scientific team has led the way in understanding the impact of embryonic exposure to dioxins. They found that exposure to dioxins in the womb during the early part of pregnancy is toxic, and

that toxicity extends into many generations in the future. The Vanderbilt team described some of their recent work in epigenetics this way: "We have recently demonstrated adult endometrial dysfunction in mice following developmental exposure to TCDD [dioxin]. Endometrial changes were markedly similar to alterations observed in the endometrium of women with endometriosis, and it resulted in reduced progesterone responsiveness and infertility."

Following are more key findings of the Endometriosis Association Research Program at Vanderbilt University School of Medicine regarding endometriosis, environmental pollutants, and reproductive health:

- Identified that in utero and developmental dioxin exposure in mice creates the same endometrial phenotype observed in women with endometriosis
- Discovered an epigenetic link between dioxin action and the loss of progesterone response observed in women with endometriosis
- Presented evidence that dioxin exposure leads to an altered pathway of cell–cell communication in the endometrium that mimics an inflammatory-like event
- Discovered developmental exposure of mice to dioxin leads to disruption of endometrial function for multiple generations, suggesting this toxicant can impact endometrial biology through the germline
- Demonstrated that nutritional anti-inflammatory agents such as fish oil can provide some protection against the disruptive impact of dioxin on endometrial function

Endometriosis is, without question, one of the most puzzling diseases affecting women and girls. While the lives of some girls and women are relatively unaffected by endometriosis, too many others have suffered severe pain and emotional stress, have at times been unable to work or carry on normal activities, and have experienced financial and relationship problems because of the disease. We need to know more about the effect environmental toxins play in the lifelong health of girls and women with endometriosis. Please choose to help the millions suffering with this life-altering disease.

ASPEN BAKER

Exhale

The Science of Support: Why We Need Research That Promotes Well-Being After an Abortion

In a recent *New York Times* interview about health care, President Obama said, "Consumers have gotten more active in their own treatments in a way that's very useful. And I think that should continue to be encouraged. To the extent that we can provide consumers with more information about their own well-being—that, I think, can be helpful."

My name is Aspen Baker and I am here to testify and advocate for research to better understand what women and their loved ones need after an abortion in order to support their own emotional well-being.

I am the founder and executive director of Exhale (www.4exhale.org), an Oakland, California-based national nonprofit organization that provides direct emotional support services to women and their loved ones after an abortion.

Our service is nonjudgmental and without political affiliation. Our mission is to create a social climate in which each person's unique experience with abortion is respected, supported, and free from stigma. We call that mission "pro-voice."

Exhale is a nationally renowned, award-winning, multilingual organization. We have been featured in *Glamour* magazine, the *New York Times* magazine, and on National Public Radio and CNN, among many other media outlets. We are currently partnering with the Advancing New Standards in Reproductive Health program at the University of California, San Francisco to study women's emotions after an abortion, a research project that is the first of its kind.

In my testimony today, I will 1) share my own personal experience with abortion, which led me to found Exhale; 2) describe the work of Exhale and what we have learned from women regarding their own well-being after an abortion; 3) describe the social and political landscape in which abortions take place today, and how Americans' view of emotional health has changed; 4) explain how past research on abortion and mental health falls short; and 5) explain what new research is necessary for women's health and well-being today.

Personal Experience Led to the Founding of Exhale and a Nonjudgmental Talkline

Ten years ago in August, I had an abortion. I was 23 years old. I had just graduated from college, and I made what was for me the very difficult decision to end my pregnancy. After the abortion, I remember feeling relieved that the angst-ridden decisionmaking process had finally come to an end, as well as the unfamiliar medical procedure, which I had been dreading, to say the least.

I also remember feeling totally surprised that nowhere in the chain of medical services did anyone talk to me about what I might expect to feel afterward, or what I could do to take care of myself emotionally. No one offered me any resources to contact afterward for counseling, should I need to. My abortion, while a simple medical procedure, was personally, a very emotional one, and I wanted support in acknowledging and processing those feelings.

When I looked for resources myself, I found instead politically and emotionally charged services that claimed to support me if I felt traumatized, or if I felt liberated. Nowhere did I find sound, helpful information grounded in credible research into women's real experiences after abortion.

Today's Social and Political Landscape, and New Beliefs About Emotional Health

What I didn't know then, but what I know now, is that I was not alone, either in my abortion experience, or in my search for information about my own emotional well-being.

According to the Guttmacher Institute, abortion remains one of the most commonly performed medical procedures in the United States, and approximately one in three women will have one in her lifetime. In 2005, 1.21 million abortions were performed, down from 1.31 million abortions in 2000. In 2005, 208,430 women obtained abortions in California, a rate of 27.1 abortions per 1,000 women of reproductive age. The rate declined 13 percent since 2000, when it was 31.2 abortions per 1,000 women ages 15–44. Abortions in California represent 17.3 of all abortions in the United States. In short, abortion is incredibly common.

And yet, as we all know, abortion is so much more than a simple medical procedure. It is at the center of a major political and moral debate that has been raging for decades. The debate raises important questions about our ideals and our values around human rights, women's health, and fetal life. Human dignity is also at stake in this debate, as opposing sides attack each other on emotional, political, and social grounds. In fact, as we all know, the conflict over abortion can be so intense that it is commonly referred to as a war.

But while this "war" around abortion has raged, American life has changed dramatically. Research shows we've increased our emotional intelligence, our emotional IQ. We have gained a respect, understanding, and a vocabulary for feelings about a whole range of life events, and we see the importance of being able to identify, share, and process those feelings. We want to know how to be physically and emotionally well, through good times and bad, and we expect our healthcare providers to be able to give us the information, resources, and support that help us experience well-being. We also take a much more active role in our own health, as President Obama said in his interview.

But when it comes to abortion, no research exists to help us do that. We need new scientific research to better understand what women and their loved ones need after an abortion in order to support their own emotional well-being, and help them take a leadership role in their own care.

What Women and Healthcare Providers Are Telling Exhale

I founded Exhale in 2000, and in 2002, we launched the Nation's first post-abortion talkline in the Bay Area, that is neither religion-based nor politically affiliated. My cofounders and I envisioned Exhale as a safe space for every woman who has had an abortion, and her loved ones, across the range of experiences, beliefs, and political persuasions. At Exhale, we believe that after an abortion, whether you are pro-life or pro-choice, you deserve to have your own unique experience seen and heard, and to get what you need for your long-term emotional well-being. This is the "pro-voice" message.

Exhale's national, multilingual talkline is operated by trained peer counselors who have undergone extensive training in our empowerment-based model. The number one way people learn about our service is through direct referral from abortion providers throughout the Nation. The second—and the fastest growing—way people learn about our service is through the Internet. They find Exhale after searching for "abortion counseling," "after-abortion support," and "women after abortion," among many other terms.

We know that after an abortion, many women go online to search for ways to share, connect, and communicate about their personal experience with others who can relate to them and support them in a nonjudgmental and respectful way. We believe this is a positive trend that can produce even more support for women if they also find, in addition to nonjudgmental services like Exhale, sound and helpful information that is the result of good research.

Since its launch in 2002, Exhale's post-abortion talkline has received more than 18,000 calls. We reach more than 35,000 women every year through our outreach and education efforts. We have trained more than 100 Bay Area women to be volunteer counselors on our talkline, and we recently received an award for "Excellence in Nonprofit Volunteer Management" from the Volunteer Center of the Bay Area.

Because of Exhale, women now have more access to nonjudgmental emotional support after an abortion than ever before. At a clinic, they are now more likely to speak to a staff person who is trained to discuss emotions around abortion, and they are more likely to receive a referral to the Exhale talkline or other nonjudgmental resources. Previously unheard-of resources are now available to them: They can read other women's stories online in our zine and in several mainstream media publications, thanks to our outreach; they can send or receive a postabortion e-card that recognizes their unique experience; and they can engage in pro-voice advocacy by sharing their personal abortion stories in a public forum, like a blog or Web video channel hosted by a nonjudgmental resource.

Exhale's efforts over the past 7 years have made a significant difference in the lives and emotional well-being of women who have had abortions, and their loved ones. They are able to take a leadership role in their own well-being. But there's more to be done.

We need you, the National Institutes of Health, to join us in our mission to understand, acknowledge, and support the emotional needs of women postabortion. We need research that helps us better understand women's emotional experiences, and that research provides women with the helpful information they need to support their own well-being and their own mental and reproductive health.

Why Past Research Is Not Enough

Since the 1970s, research regarding women's emotions around abortion has focused on whether abortion, on its own, has negative consequences for women's mental health, and the research was meant to serve one side of the political debate or the other.

Famously, the Surgeon General under President Reagan determined that despite the popular claim that abortion has negative consequences on women's psychological health, the data behind that claim were insufficient. Most recently, in 2008, the American Psychological Association completed another review of existing literature and concluded there is no evidence of negative mental health effects from abortion. They found that the research that did show negative emotional impact had severe methodological flaws that made the data unreliable. Further scientific inquiry into women's mental health after an abortion has found other predictors for poor mental health outcomes, including pre-existing mental health conditions; a lack

of social support; a lack of self-esteem; and the heated public controversy around abortion, just to name a few. It is safe to say that there is scientific agreement that abortion, on its own, rarely causes severe negative outcomes for a woman's mental health.

But what else about women's emotional well-being after an abortion has been determined by science, beyond the fact that abortion, on its own, does not damage women's mental health? At a time when the emotional experience of any life event is publicly accepted as important and relevant to our overall health and wellness, there remains a great deal to be studied and researched about abortion.

Today, more than ever, there is a great need for sound, thorough research into women's emotional well-being after an abortion. The abortion procedure is so common; the families and communities impacted are so diverse; the debate around abortion is so loud; and the overwhelming stigma—which, according to NIH's own definition, "threatens psychological and physical well-being, and helps to perpetuate health inequalities within societies"—is so harmful that it is time for the National Institutes of Health to proactively address the emotional needs of women who have abortions by using its support and resources to undertake and share sound, thorough research into women's real experiences.

This research would accomplish the following:

- Assess the psychological and emotional needs of women after an abortion
- Evaluate the effects of different postabortion emotional support models on a woman's well-being
- Examine men's emotional experience with abortion
- Understand the characteristics of healthy coping after an abortion in diverse communities
- Explore the connection between the social experience and the emotional experience of abortion

Why This Research Matters

It is critical that the National Institutes of Health address emotional and mental health as part of its strategies to promote women's health and wellness. And when an issue is as common and as contentious as abortion, it is even more critical. Not only can research promote long-term emotional well-being, it can also dispel politically and emotionally charged claims that distract from emotional well-being.

Benefits of this research include the following:

- Provide medical and emotional care providers with the information we need to support patients' emotional resiliency and well-being in the long term
- Provide intimate partners, family members, and communities with information about how to be a source of comfort and support for their loved ones and each other

- Provide women with the tools and information to make well-informed decisions about their health, including pregnancy and abortion, and strategies to promote their own emotional well-being
- Provide information to women and healthcare providers about appropriate interventions and responses when a woman does have negative emotional consequences after an abortion

As a woman who has had an abortion, as the cofounder of an organization that now serves thousands of women and men each year, and as a peer counselor who has listened to many women share their stories and their feelings after an abortion, I know that Exhale has already met a need, just by providing safe, nonjudgmental emotional support for women and men after an abortion.

But I also know that we need to do more. We need to provide women and men with the kind of helpful, well-researched information that supports their well-being after an abortion. We need sound, detailed research that addresses the broad range of experiences and feelings people have around abortion, immediately afterward, and far into the future. We need research that reflects the real experiences of people like the women and men who call Exhale to share their stories, receive emotional support, and achieve emotional well-being.

Today, I call on the National Institutes of Health to join us in this work. I ask the NIH to take a leadership role, as only it can, in providing the research and information that will help today's healthcare providers and patients achieve emotional well-being after an abortion.

DANIELLE THOMAS

Exhale

The Science of Support: Why We Need Research That Promotes Well-Being After an Abortion

Introduction

In a recent *New York Times* interview about health care, President Obama said: "Consumers have gotten more active in their own treatments in a way that's very useful. And I think that should continue to be encouraged. To the extent that we can provide consumers with more information about their own well-being—that, I think, can be helpful.

My name is Danielle Thomas and I am here to testify and advocate for research to better understand what women and their loved ones need after an abortion in order to support their own emotional well-being.

I am an After-Abortion Peer Counselor at Exhale (www.4exhale.org), an Oakland, California-based national nonprofit organization that provides direct emotional support services to women and their loved ones after an abortion.

Our service is nonjudgmental and without political affiliation. Our mission is to create a social climate in which each person's unique experience with abortion is respected, supported, and free from stigma. We call that mission "pro-voice."

Exhale is a nationally renowned, award-winning, multilingual organization. We have been featured in *Glamour* magazine, the *New York Times* magazine, and on National Public Radio and CNN, among many others. We are currently partnering with the Advancing New Standards in Reproductive Health program at University of California–San Francisco to study women's emotions after an abortion, a research project that is the first of its kind.

In my testimony today, I will do the following:

- Share my volunteer experience as an After-Abortion Peer Counselor
- Describe the work of Exhale and what we have learned from women regarding their own well-being after an abortion
- Describe the social and political landscape in which abortions take place today, and how Americans' view of emotional health has changed
- Explain how past research on abortion and mental health falls short
- Explain what new research is necessary for women's health and well-being today

Volunteer Experience as an After-Abortion Counselor

"I'm so glad this service exists" is a statement I hear frequently as a counselor on the Exhale talkline. Many times, women have no support or safe space to speak about their abortion experience. Exhale provides that support and space, and I continually bare witness to the positive impact the counseling model has on the emotional health of our callers.

A prevalent emotion in my calls is one of surprise. Women are surprised that the feelings they're having are experienced by others, that abortion happens a lot, and that people still aren't talking about it. These simple facts are surprises because as a society, we still haven't made it okay to talk about abortion in a safe and understanding way. These women and the people in their lives desperately want to connect with others who've had similar experiences. Women with abortion experiences long for a place where they can be understood and accepted.

The Exhale talkline allows callers to share their story free from judgment and stigma and the more shifts I have, the more I realize this environment isn't available anywhere else. The lack of availability of this thinking and space coupled with the impact I see drives me to dedicate myself to Exhale and its mission more and more. This environment and the "pro-voice" spirit are true catalysts for change.

Today's Social and Political Landscape, and New Beliefs About Emotional Health

According to the Guttmacher Institute, abortion remains one of the most commonly performed medical procedures in the United States, and approximately one in three women will have one in her lifetime.

In 2005, 1.21 million abortions were performed, down from 1.31 million abortions in 2000. In 2005, 208,430 women obtained abortions in California, a rate of 27.1 abortions per 1,000 women of reproductive age. The rate declined 13 percent since 2000, when it was 31.2 abortions per 1,000 women ages 15–44. Abortions in California represent 17.3 of all abortions in the United States. In short, abortion is incredibly common.

And yet, as we all know, abortion is so much more than a simple medical procedure. It is at the center of a major political and moral debate that has been raging for decades. The debate raises important questions about our ideals and our values around human rights, women's health, and fetal life. Human dignity is also at stake in this debate, as opposing sides attack each other on emotional, political, and social grounds. In fact, as we all know, the conflict over abortion can be so intense that it is commonly referred to as a war.

But while this "war" around abortion has raged, American life has changed dramatically. Research shows we've increased our emotional intelligence, our emotional IQ. We have gained a respect, understanding, and a vocabulary for feelings about a whole range of life events, and we see the importance of being able to identify, share, and process those feelings. We want to know how to be physically and emotionally well, through good times and bad, and we expect our healthcare providers to be able to give us the information, resources, and support that helps us experience well-being. We also take a much more active role in our own health, as President Obama said in his interview.

But when it comes to abortion, no research exists to help us do that. We need new scientific research to better understand what women and their loved ones need after an abortion in order to support their own emotional well-being, and help them take a leadership role in their own care.

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JANICE HUMPHREYS, PH.D., RN, CS, NP

Group of Concerned Nurse–Researchers

Violence and Abuse Are Global Health Problems for Women

While the documents describing women's health globally make compelling reading, they fail to address a major factor that disproportionally affects women and underpins both many of women's unique health problems and the factors that underpin their failure to receive adequate treatment, namely violence and abuse. Because of the comprehensive nature of violence and abuse, my colleagues and I have chosen to follow the general framework developed by the World Health Organization (WHO) in their 2002 report, *World Report on Violence and Health.*[1] In addition, the most recent update, *Third Milestones of a Global Campaign for Violence Prevention Report 2007,*[2] reviews the global progress to date. More importantly, it sets out what we can do over the next 5 years to expand global violence prevention programming and to demonstrate, in terms of lives saved and suffering averted, the impact of violence prevention.

Violence is defined as "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation," according to the 2002 report. This definition encompasses interpersonal violence, suicidal behavior, and armed conflict. "It also covers a wide range of acts, going beyond physical acts to include threats and intimidation. Besides death and injury, the definition also includes the myriad and often less obvious consequences of violent behavior such as psychological harm, deprivation, and maldevelopment that compromise the well-being of individuals, families, and communities."

The WHO and others generally take an ecological approach in conceptualizing the causes of violence. Individual (e.g., biology, personal history, socioeconomic status, education, substance abuse, etc.), relationship (e.g., exposure to harsh childrearing, family dysfunction, forced marriages of children, childhood exposure to intimate partner violence between parents, etc.), community (e.g., poverty, racism, high population density, low social status, etc.), and societal (e.g., societal tolerance for violence, easy availability of weapons, gender/race/ethnicity-based inequalities, "culturally-based" sexual enslavement of children, etc.) factors are intertwined in a complex interaction that must be considered when attempting to understand and prevent violence. The initial WHO report posed that violence was preventable and that interventions were possible at each of these levels. The 2007 report updates the status of these efforts.

Based upon the growing body of increasingly rigorous research, we believe that there is strong evidence that violence, in and of itself, is a global health concern, especially for women. Violence-related suffering and death occur across the lifespan and in recent years, it has become increasingly clear that there are links among the different types of violence, whether they are self-inflicted, interpersonal, or collective. For example, the presence of one type of violence tends to directly increase the risk of an individual, family, or community for another type. In addition, risk factors, such as substance abuse, mental illness, and economic inequalities increase the risk for most types of violence. Therefore, efforts to prevent one type of violence have the potential to reduce the risk of another. Interventions that reduce risk factors can have across-the-board benefits in reducing violence.

Violence itself is now understood to be a major risk factor for other women's health consequences. "Evidence now suggests that in addition to the immediate physical consequences, violence has a variety of other less obvious health, social, and economic consequences."[2] Intimate partner violence, which disproportionately affects women, has been shown to result in physical injury and death. However, it is also associated with risk of chronic physical syndromes, and psychological and behavioral consequences. Violence has also been associated with various chronic diseases, including cancer, ischemic heart disease, and chronic lung disease, in part due to unhealthy behaviors. Violence can be a risk factor for a range of sexual and reproductive health problems, including infertility, pregnancy-related complications, unsafe abortion, pelvic inflammatory disorders, sexually transmitted infections, and unwanted pregnancy.

The intersections of human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS) and intimate partner violence for both men and women are increasingly being

recognized and definitively documented with persuasive and rigorous research. The important interfaces of HIV and violence for women can be summarized as follows: 1) epidemiological studies showing significant overlap in prevalence; 2) studies showing intimate partner violence as a risk factor for HIV; 3) studies showing violent victimization increasing HIV risk behaviors, including intravenous drug use; 4) emerging research showing immune system alteration from violence victimization in women; 5) studies showing violence or stigma and/or fear of violence impeding or as a consequence of HIV testing; 6) studies showing partner violence as a risk factor for sexually transmitted diseases, which increases the rate of transmission of HIV; 7) data indicating that abusive men are more likely to have other sexual partners unknown to their wives; and 8) studies showing the difficulties of negotiating safe sex behavior for abused partners. In addition, there are hypothesized but as yet untested relationships between increased HIV transmission and intimate partner violence through intimate partner forced sex, known as a frequent form of intimate partner violence. Forced vaginal sex may cause trauma that increases the chance of transmission. In addition, abused women report forced anal sex as a frequent form of forced sex in violent intimate relationships, and anal sex is known to increase HIV transmission.

The last decade has seen the use of rape as a "weapon" of war in many parts of Africa. Rape is all too common with many of the victims subjected not only to forcible sexual intercourse, but also to an array of torture and mutilation over extended periods of time. The vast majority of rape victims are female and age offers no protection.[3] If the victim survives the trauma of the actual assault, her trauma is further increased by the risk of HIV infection, disease, and social isolation. The psychological effects of stigmatization, loss of family, and trauma related to violence causes severe harm and can lead to post-traumatic stress syndrome and depression. Further, survivors of rape are often stigmatized by the community, especially if they are infected with HIV and/or pregnant from the rape; they may be forced to abandon the child as "cursed." All of these human rights violations cause rapid and unnecessary deaths.

We must also consider other direct and indirect forms of violence, especially against women. In the home, within families, many nations presume there is safety for women. This often proves to be a falsehood. The trading of girl children for dowries, placing them in arranged marriages at 10, 12, 15 years of age, while they are still developing physiologically, intellectually, and emotionally, increases their risk for violent victimization. The educational process for these child brides is often ended, to say nothing of the fact that in some countries, girls are not sent to school at all. Economic, educational, and health disparities are subtle forms of violence that are too often morally invisible. Women rejected by their husbands, or who have been culturally deemed "unmarriageable," may be beaten, stoned, or forced to commit suicide. Religious excuses are given for these misogynist "rules," while in truth, the major religions do not condone these violent practices. They stem from cultural and patriarchal assumptions that simply favor males over females, deeming women the property of fathers, brothers, and husbands. Infanticide of girl children has not ceased with the march of modern advancements. Children, especially poor girls whose parents reject them, or who run away from untenable marriage, fall prey to pimps and purveyors of the flesh trade. Girls and women are sold and traded into slaveries where they face confinement and/or forced sweatshop labor.

Violence has been shown to damage the social fabric of communities and is disruptive to community and family relationships. Intimate partner violence can result in isolation and problems with social integration. Increasingly, intimate partner violence is being shown to jeopardize abused women's ability to sustain employment and to be productive members of society. In addition, it is necessary to recognize that when compared to men in the workforce, women are underemployed, undercompensated, and underpromoted. Crucially, in all cultures, they spend many hours doing delegitimized, unpaid labor that sustains children and families. As immigrants and refugees, they often are limited to low-wage work as maids, cooks, and nannies. This economic disparity is one source of violence against women and carries with it health risks that result in limited or no access to health insurance and/or health care and indeed threatens the survival of women. Additional research is now associating women's exposure to intimate partner violence even with infants' development. Childhood aggression has been shown to be a predictor of violence in adolescence and adulthood. Both child maltreatment and intimate partner violence are associated with relationship, academic, and employment problems.

The economic costs of violence are staggering and place an enormous burden on national economies through increased healthcare and legal costs, absenteeism from work, and lost productivity. The Centers for Disease Control and Prevention concluded that the total costs associated with nonfatal injuries and deaths due to violence in 2000 were more than $70 billion in the United States alone! The majority of this cost was due to lost productivity, but an estimated $5.6 billion was spent on health care for more than 2.5 million injuries that were due to interpersonal and self-directed violence. However, the WHO also concludes that the economic consequences of violence are limited due to the scarcity of studies in this area from low- and middle-income countries that are known to be disproportionately affected by violence.

We believe that any effort to improve the health of women must also address violence. Furthermore, violence prevention efforts must be expanded and an ecological perspective that considers individual, family, community, and societal factors is essential. Toward that end, we support the recommendations of the WHO, which are summarized below.

Recommendations of the *World Report on Violence and Health*:

1. Create, implement, and monitor a national action plan for violence prevention
2. Enhance capacity for collecting data on violence
3. Define priorities for, and support research on, the causes, consequences, costs, and prevention of violence
4. Promote primary prevention responses
5. Strengthen responses for victims of violence
6. Integrate violence prevention into social and educational policies, and thereby promote gender and social equality

7. Increase collaboration and exchange of information on violence prevention
8. Promote and monitor adherence to international treaties, laws, and other mechanisms to protect human rights
9. Seek practical, internationally agreed-upon responses to the global drug trade and the global arms trade

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HUGH BROWN III

HIV/AIDS Services for African-Americans in Alaska

More Research Is Needed for Women of Color

Human Immunodeficiency Virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS) Services for African-Americans fully support more research for women, especially women of color in regard to HIV/AIDS.

HUGH BROWN III

HIV/AIDS Services for African-Americans in Alaska

Support Contractual and Grant Funding for African-American Organizations in Alaska for Health Research for Women and Men

It is important to build the capacity of smaller organizations that serve women locally. These organizations can advance the wellness of our nation if we make the investments now. Research priorities should include HIV prevention risk factors. Racism, poverty, domestic violence, and mental illness must be addressed. Reproductive rights are important. Lack of healthcare access can be somewhat reduced in communities by increasing research activities. Work in collaboration with community stakeholders.

LAURA MOSIER

Indiana State Department of Health

The Indiana Women's Diabetes Initiative Client Navigation System

Vision

Improve outcomes and quality of life for women living with diabetes in Indiana through enhanced self-management.

Mission

Connect women living with diabetes to education, resources, and services through the development of meaningful State and local partnerships, identification and removal of barriers, and collection and analyses of data. Take Control of Your Diabetes. Share. Learn. Live.

Program Description

The Indiana Women's Diabetes Initiative focuses on implementing Healthy People 2010 objectives on diabetes and the cross-cutting focus areas of nutrition and overweight, physical activity and fitness, as well as smoking cessation. The Indiana Diabetes Advisory Council serves as the public health system/collaborative that is the foundation for this project, and the Women's Health Committee under the Indiana Diabetes Advisory Council serves as the steering committee for this project. The Office on Women's Health (OWH) employs a full-time project director serving as the committee chair and oversees all aspects of the project. A part-time epidemiologist is under contract to assist with surveillance tracking, data collection, and reporting. Three community partners (Northern: Elkhart County Health Department; Central: Howard County Medical Society; and Southern: Hoosier Uplands [Lawrence County]) implement the pilot client navigation system for female clients with diabetes. Each navigation system utilizes evidence-based strategies to focus on specified Healthy People 2010 objectives (see below) to improve outcomes for Hoosier women with diabetes. In addition, sustainability plans are being developed to continue project activities after the initial grant funding through the U.S. Department of Health and Human Services ends, and to expand to additional counties in the future.

A description of the eligible population:

- Women
- Over 18 years of age
- Diagnosed by a physician with type 1 or type 2 diabetes

The Five Steps of Client Navigation

Community Outreach. Program coordinators share with women the benefits of participating in the Diabetes Initiative.

Eligibility. Any woman over age 18 who has been diagnosed with diabetes is invited to participate and learn how to better control her diabetes.

Client Data Assessment Screening. Women meet with the program coordinator in their county to confidentially share problems they are having with diabetes, including barriers to getting care.

Individual Client Plan. Women learn from program coordinators about how to set achievable goals and get connected to resources that will help them better control their diabetes.

Followups. Program coordinators continue to work with women to assess their diabetes care and set new goals. The end result is for each woman to better self-manage her diabetes and live a longer, healthier life.

Targeted Healthy People 2010 Objectives

Diabetes

5-1 Increase the proportion of persons with diabetes who receive formal diabetes education

5-12 Increase the proportion of adults with diabetes who have a glycosylated hemoglobin measurement at least once a year

5-13 Increase the proportion of adults with diabetes who have an annual dilated eye examination

5-14 Increase the proportion of adults with diabetes who have at least an annual foot examination

5-15 Increase the proportion of adults with diabetes who have at least an annual dental examination

5-17 Increase the proportion of adults with diabetes who perform self-blood-glucose-monitoring at least once daily

Nutrition and Overweight

19-1 Increase the proportion of adults who are at a healthy weight

19-2 Reduce the proportion of adults who are obese

Physical Activity and Fitness

22-1 Reduce the proportion of adults who engage in no leisure-time physical activity

Smoking Cessation

27-1 Reduce tobacco use by adults

I. Goal/Purpose of the ASIST 2010 Program

The overarching goal of the Indiana Advancing System Improvements to Support Targets for Healthy People 2010 (ASIST 2010) project is to use a public health systems approach to improve women's access to diabetes care and related outcomes for clinical management, nutrition and weight, and physical activity and fitness. This goal will be accomplished by expanding the Indiana Diabetes Advisory Council to include a Women's Health Committee that will provide guidance for the development of three pilot patient navigation systems focused on assisting females with diabetes to navigate barriers related to specified Healthy People 2010 objectives. The target audience for the pilot patient navigation system is females who are 18 years of age and older with a self-reported physician diagnosis of diabetes in Elkhart, Howard, and Lawrence counties.

II. ASIST 2010 Focus Area and Objectives

The following Healthy People 2010 Objectives are being addressed by the Indiana ASIST 2010 Program:

Diabetes

5-1 Increase the proportion of persons with diabetes who receive formal diabetes education

5-12 Increase the proportion of adults with diabetes who have a glycosylated hemoglobin measurement at least once a year

5-13 Increase the proportion of adults with diabetes who have an annual dilated eye examination

5-14 Increase the proportion of adults with diabetes who have at least an annual foot examination

5-15 Increase the proportion of adults with diabetes who have at least an annual dental examination

5-17 Increase the proportion of adults with diabetes who perform self-blood-glucose-monitoring at least once daily

Nutrition and Overweight

19-1 Increase the proportion of adults who are at a healthy weight

19-2 Reduce the proportion of adults who are obese

Physical Activity and Fitness

22-1 Reduce the proportion of adults who engage in no leisure-time physical activity

A. Progress-to-Date With Focus Area/Objective Activities

The Indiana Women's Diabetes Initiative (IWDI) is making tremendous strides in connecting diabetic women to resources related to the diabetes Healthy People 2010 objectives in each of the three pilot counties. The Project Director and the Program Coordinators are building and sustaining partnerships on the State and county levels. In addition to building and sustaining partnerships, the IWDI efforts from January 2009 until April 2009 have revolved around developing a marketing plan and building, maintaining the infrastructure for our diabetes program, presenting at a State and a national conference, continuing client enrollment, and collecting annual followup data.

IWDI Partnerships. IWDI is continuing to build new partnerships, but in addition, we are sustaining workable partnerships. The program director has been working on streamlining the partnerships on State and county levels.

IWDI Marketing Plan. The IWDI Marketing Plan is completed and we have submitted it to the Indiana State Department of Health/Office of Women's Health Division for final approval. The marketing plan will be effective for Year 2 and Year 3 of the grant for all levels (county and State). To assist in marketing the IWDI program, we have designed, developed, approved, and printed postcards and bookmarks to be distributed on the State and county levels.

IWDI Presentations. The program director and epidemiologist each submitted abstracts for presentations to conferences and each of the abstracts was accepted to present in April 2009. The program director abstract was accepted for a poster presentation at the Indiana Public Health Association Conference in Indianapolis, IN, and the epidemiologist abstract was accepted for an oral presentation at the Centers for Disease Control and Prevention Diabetes Translation Conference in Long Beach, CA.

IWDI Infrastructure. We are continuing to strengthen the communication within IWDI through monthly conference calls, quarterly trainings, and semiannual county site visits. All the counties are working extremely hard to promote the IWDI program. This is truly evident when the majority of the clients in most of the counties indicated that they learned about the IWDI program through "word of mouth."

IWDI Data and Surveillance. Enrollment is steadily increasing for IWDI. We have enrolled 249 women in the 3 pilot counties in April 2009. We are continuing to track our enrollment numbers, the needs of our clients, and the amount of time and resources it takes to provide quality services so that we can develop updated enrollment goals that are realistic based on what we have learned. We are also exploring possible ways to integrate our data into existing statewide surveillance systems so that we can be part of and benefit from established surveillance efforts. The project director, director of OWH, and our epidemiologist are currently working with the ISDH Surveillance director to discuss possible data linkages and crossover, specifically related to the HP 2010 diabetes objectives we are monitoring and the related program components. Effort on each focus area/objective relates directly to the development and maintenance of the Indiana ASIST 2010 Client Navigation System.

Diabetes

5-1 Increase the proportion of persons with diabetes who receive formal diabetes education
(83.3 percent [n=125] of current IWDI clients have NOT ever taken a formal diabetes education class)

5-12 Increase the proportion of adults with diabetes who have a glycosylated hemoglobin measurement (A1C) at least once a year
(36.9 percent [n=55] of current IWDI clients have NOT had an A1C measurement in the past 12 months)

5-13 Increase the proportion of adults with diabetes who have an annual dilated eye examination
(64.4 percent [n=96] of current IWDI clients have NOT had or don't know if they have had an eye exam in the past 12 months)

5-14 Increase the proportion of adults with diabetes who have at least an annual foot examination
(56.1 percent [n=83] of current IWDI clients have NOT had or don't know if they have had a foot exam in the past 12 months)

5-15 Increase the proportion of adults with diabetes who have at least an annual dental examination
(69.8 percent [n=104] of current IWDI clients have NOT had or don't know if they have had a dental exam in the past 12 months)

5-17 Increase the proportion of adults with diabetes who perform self-blood-glucose-monitoring at least once daily
(54.0 percent [n=81] of current IWDI clients do not check their blood for glucose at least one time per day)

Nutrition and Overweight

19-1 Increase the proportion of adults who are at a healthy weight
(19.8 percent [n=26] of current IWDI clients are overweight and 74.1 percent [n=103] are obese [combined 93.9 percent are overweight or obese])

19-2 Reduce the proportion of adults who are obese

- The Indiana State Department of Health (ISDH) received CDC Obesity and Nutrition funds for the first time to develop nutrition and physical activity programs in Indiana.
- The director of this grant spoke at our last Women's Health Steering Committee to begin discussing ways to integrate our efforts.
- The mean body mass index for current IWDI clients is 36.6.

Physical Activity and Fitness

22-1 Reduce the proportion of adults who engage in no leisure-time physical activity.
(56.1 percent [n=82] of current IWDI clients do not participate in leisure-time physical activity.)

B. Describe Problems Encountered With Program Implementation and Their Resolution

Problem 1. Given that this is a pilot project and we are gaining valuable insight as we go, we are still determining exactly how we envision the program operating and how the day-to-day operations affect that overall vision. At times, it has been clear that not all staff working on the project had the same vision in mind or the best way to achieve that vision. This has led to miscommunication and misinterpretations along the way and opened our eyes to the need for clearer expectations for all staff as well as the clients we serve and our partners.

Solution. The development of a vision and mission statement, a community outreach event and activity authorization form, implementation of the IWDI share point site, and conduct of monthly conference calls and quarterly trainings are helping to improve communication and get everyone on the same page to see the big picture and ensure we are all working toward the same overall goal, while taking into consideration the valuable insights we have gained thus far. In addition, we have started to meet every other month and have an all-day "face to face" working meeting to discuss problems, lessons learned, and program development sustainment.

Problem 2. Indiana ASIST 2010 was not able to enroll 500 women into the patient navigation system in year one. Reasons include the following:

- The project team was not fully hired until late February 2008 due to the ISDH hiring process, which delayed planning and implementation of the client navigation system (CNS).
- The number of clients to be enrolled annually was overestimated at the time of the proposal. Our clients tend to have numerous unmet objectives, so contact with participants is time-consuming to ensure the quality and depth of service needed.

Solution. The Director of the OWH and Indiana ASIST 2010 Project Director have begun work to reevaluate program objectives and set more realistic projections based on what we learned during the first grant year. Additionally, the ASIST 2010 staff has been hired and the program is fully staffed, so this is no longer a barrier. We currently have 249 women enrolled (as of April 2009). The program coordinators have been working 30 hours per week doing baseline assessments and—starting in April 2009—annual assessments. By the end of the grant cycle in August 2010, the program coordinators should have 500 baseline assessments and 250 annual assessments. The numbers are not where we originally predicted, but the client navigation system works and the program coordinators have connected the clients to resources; eliminated barriers; and navigated each woman to becoming her own advocate, taking control of her diabetes, and living a better quality of life.

Problem 3. Dental care partnerships have been difficult to establish in each pilot county due to the high cost of dental equipment and lack of low income dental clinics.

Solution. They are working with three dental clinics and have reached an agreement to provide an annual dental examination based on a sliding scale. The project director is negotiating a sliding-fee scale for annual dental exams because the majority of our IWDI clients do not have dental insurance. IWDI has formed a partnership with the Mobile Smiles program from

Michigan. The program director has negotiated for the Michigan portable dental units to go to each county every summer to provide dental care examination, dental education, and oral cancer screening for $25.00 per client. In addition, the client can receive two bitewing X-rays for an additional $35.00. The mobile dental unit has the summer free because they normally do children's dental examinations during the school year. This meets our objective for an annual dental examination for our client navigation program. If the clients have more extensive dental needs, we can refer the clients to the Indiana Health Care Center/Dental Clinics in their county.

C. Lessons Learned and Recommendations To Improve the ASIST 2010 Program

There have been many lessons learned in the past year and a half. The first lesson learned is that since this is a pilot project, there is nothing set in stone and there is more than one way to do something. What works in one county may not work in another county. Flexibility and communication are key to the success of our project.

The second lesson learned is that each member of our IWDI team has strengths and talents; this has really come in handy in the development of the infrastructure of our team. For example, one of our county coordinators has graphic design experience. Now that we have an approved logo, slogan, tagline, and mission and vision statement, she is able to design flyers and each county can get them printed as needed. Another county coordinator is bilingual and she is able to translate our printed materials into Spanish. The third county coordinator has 20 years' experience in health education and worksite wellness and she has developed training manuals. She will also develop a training manual for the county coordinators (navigators) and assist in our sustainability efforts. By having the IWDI team members strengthen and use their talents, it brings our team together and gives each of the county coordinators a sense of ownership to the IWDI program.

The last lesson learned is to speak to be understood and to listen to understand. This is hard because everyone has something to say, but interruptions and misinterpretation can be halting factors.

III. Status Updates

A. Surveillance System Implementation

IWDI staff met with the director of the State Health Data Center and the Behavioral Risk Factor Surveillance System Coordinator in January 2009 to discuss surveillance resources available at the Indiana State Department of Health that might support and help sustain the IWDI. The goal of this initial meeting was to share information and examine opportunities for collaboration on data sharing and tracking. During this meeting, we learned that although the Indiana State Department of Health (ISDH) surveillance system is primarily designed for preparedness, some behavioral and clinical data are available via the system's partners, specifically Indiana Health Information Exchange (IHIE). It was suggested that we expand our conversations to include the State Health Data Center partners, including members of the IHIE and the Technical Assistance Program at Purdue University. Immediate next steps include meeting with these partners to discuss collaboration and providing the director of the State Health Data Center with copies of our assessment forms and other documents that will provide additional information about our data needs and capabilities.

B. Sustainability Efforts/Activities

The development of the IWDI marketing plan has been a big endeavor this quarter. The purpose of this plan is to establish policies on the State and county levels, maintain sustainable partnerships relative to the IWDI program, and to establish conformity among the three pilot counties on how outreach opportunities are analyzed and selected. IWDI has also made great strides in having sustainable HP 2010 objectives. The HP 2010 objectives listed below have been met and sustained into the IWDI program.

5-1 Increase the proportion of persons with diabetes who receive formal diabetes education. The program director has established and sustained a free diabetes education program in all three pilot counties. Each county has a certified diabetes educator, certified registered dietician, or a retired registered nurse to teach the classes in conjunction with Roche Diagnostics "Healthy Habits" classes. The partnership with the diabetes educators and Roche Diagnostic has proven to be a valuable part of sustaining the diabetes education classes. The classes are taught every 6 months for 3 consecutive weeks and each class is 1½ to 2 hours. The program coordinators have opened the classes to the entire community, but incentives are given to only the IWDI clients.

5-13 Increase the proportion of adults with diabetes who have an annual dilated eye examination. The program director has partnered with Prevent Blindness Indiana (PBI) "Gift of Vision" Program. This program provides a free annual eye examination and a free pair of eyeglasses (if needed) to eligible clients (based upon dire financial need). PBI tracks the IWDI referrals to the "Gift of Vision" program; to date, we have referred 77 IWDI clients and had 60 IWDI confirmed appointments. PBI has a network of ophthalmologists in each pilot county for the IWDI clients to choose from and the program coordinator connects the IWDI clients to this resource.

5-14 Increase the proportion of adults with diabetes who have at least an annual dental examination. The program director has partnered with a Michigan Mobile Dental Unit that will be providing annual dental examinations, dental health education, oral cancer screening, and bitewing X-rays for a minimum fee. The portable dental unit will be providing services in the summer months (during the rest of the year, they provide services to schools all over the country). The program coordinators schedule their visits. The dental units do not charge time for travel; they only charge for services. The annual dental examinations, dental health education, and oral cancer screening is $25.00/client. The two bitewing X-rays is an additional $35.00/client. The dental unit will provide services to the communities each summer. This is sustainable for each community and the IWDI program.

The other sustainability efforts that the program director is developing is to integrate the other ISDH chronic disease divisions to incorporate the client navigation system. The IWDI Team is compiling an IWDI Resource toolkit, including a program coordinator's training manual, to enhance a client navigation system for chronic disease in Indiana.

C. Public Health System/Collaborative Partnership

The IWDI meets with the Indiana Diabetes Advisory Council (IDAC) on a quarterly basis. The meetings are a collaboration of diabetes efforts and initiatives in Indiana as they relate to

diabetes care. IWDI staff runs the Woman's Health Steering Committee meetings, and we have guest speakers to assist in tackling the barriers in our pilot counties. At the upcoming IDAC in January, the project director and epidemiologist will be giving a presentation of the IWDI program.

D. Incorporation of Gender Focus

Women over 18 who have a self-reported physician diagnosis of diabetes continue to be the target audience for the Indiana ASIST 2010 project. Women were chosen as the focus group for this project because they are the main caretakers in families of all types and vital to the household infrastructure and management. Our goal is to provide women with the tools needed to self-manage their diabetes through a coordinated client navigation system, and we feel that their families will also benefit. The focus on women is proving valuable because the county program coordinators are finding that by helping the women, their families are also becoming more active and the women are cooking healthier meals for everyone.

E. Staffing

Laura Mosier, B.S., Project Director of ASIST 2010
Tanya Parrish, M.P.H., CHES, Director of OWH
Carolyn Muegge, M.S., M.P.H., Epidemiologist
Jennifer Kerner, Research Assistant
Monica Brooks, MT, CNHP, Program Coordinator (Elkhart County)
Katie Hillman, M.Ed., Program Coordinator (Howard County)
Violet Reynolds, AS, Program Coordinator (Lawrence County)

JENNIFER PIERCE-WEEKS, RN, SANE-A, SANE-P

International Association of Forensic Nurses
Funding Priorities for Research Dollars

The International Association of Forensic Nurses (IAFN) is an international professional nursing association whose mission is to provide leadership in forensic nursing practice by developing, promoting, and disseminating information internationally about forensic nursing science.

Violence and Health of Women

Violence against women is a public health and healthcare issue rooted in poverty, social injustice, and systems unresponsive to the health needs of women.[1] Violence is a major factor that disproportionally affects women and underpins many of the unique health problems experienced by women.[1,2] Violence against women is comprehensive in its impact on women's health, affecting physical, emotional, psychological, and spiritual health.[2] Violence against women contributes to the failure of women to receive adequate health care and treatment[1] targeted by the National Institutes of Health (NIH) women's health research agenda initiatives. However, the comprehensive response necessary for the development of prevention and treatment of violence against women is not identified as a priority in this NIH initiative. The IAFN encourages the NIH Women's Health Research Agenda initiatives to look at the overwhelming

evidence and include a research focus on the prevention, intervention, and treatment of the environments leading to and the health effect of violence against women.

Violence is defined as "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation."[1] This definition encompasses interpersonal violence, suicidal behavior, and armed conflict. "It also covers a wide range of acts, going beyond physical acts to include threats and intimidation. Besides death and injury, the definition also includes the myriad and often less obvious consequences of violent behavior, such as psychological harm, deprivation, and maldevelopment that compromise the well-being of individuals, families, and communities."[1]

The World Health Organization (WHO) and others generally take an ecological approach in conceptualizing the causes of violence. Individual (e.g., biology, personal history, socioeconomic status, education, substance abuse, etc.), relationship (e.g., exposure to harsh childrearing, family dysfunction, forced marriages of children, childhood exposure to intimate partner violence between parents, etc.), community (e.g., poverty, racism, high population density, low social status, etc.), and societal (e.g., societal tolerance for violence, easy availability of weapons, gender/race/ethnicity-based inequalities, "culturally-based" sexual enslavement of children, etc.) factors are intertwined in a complex interaction that must be considered when attempting to understand and prevent violence.[1] The initial WHO report posed that violence was preventable and that interventions were possible at each of these levels.[1] The 2007 report updates the status of these efforts.

Based upon the growing body of increasingly rigorous research, we believe that there is strong evidence that violence, in and of itself, is a global health concern, especially for women.[3] This notion has been supported by evidence-based research and organizations globally have adopted initiatives to define and end violence against women.[3] Violence-related suffering and death occur across the lifespan, and in recent years, it has become increasingly clear that there are links among the different types of violence, whether they are intended, unintended, interpersonal, or collective. For example, the presence of one type of violence tends to directly increase the risk of an individual, family, or community for another type. In addition, risk factors, such as substance abuse, mental illness, and economic inequalities, increase the risk for most types of violence.

Therefore, efforts to prevent one type of violence have the potential to reduce the risk of another. Interventions that reduce risk factors can have across-the-board benefits in reducing violence.

Violence itself is now understood to be a major risk factor for other women's health consequences. "Evidence now suggests that in addition to the immediate physical consequences, violence has a variety of other less obvious health, social, and economic consequences" (WHO, 2007). Intimate partner violence, which disproportionately affects women, has been shown to result in physical injury and death. However, it is also associated with risk of chronic physical syndromes, and psychological and behavioral consequences. Violence has also been associated with various chronic diseases, including cancer, ischemic heart disease, and chronic

lung disease, in part due to unhealthy behaviors. Violence can be a risk factor for a range of sexual and reproductive health problems, including infertility, pregnancy-related complications, unsafe abortion, pelvic inflammatory disorders, sexually transmitted infections, and unwanted pregnancy.

The intersections of human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS) and intimate partner violence for both men and women are increasingly being recognized and definitively documented with persuasive and rigorous research. The important interfaces of HIV and violence against women can be summarized as follows: 1) epidemiological studies showing significant overlap in prevalence; 2) studies showing intimate partner violence as a risk factor for HIV; 3) studies showing violent victimization increasing HIV risk behaviors, including intravenous drug use; 4) emerging research showing immune system alteration from violence victimization in women; 5) studies showing violence or stigma and/or fear of violence impeding or as a consequence of HIV testing; 6) studies showing partner violence as a risk factor for STDs, which increase the rate of transmission of HIV; 7) data indicating that abusive men are more likely to have other sexual partners unknown to their wives; and 8) studies showing the difficulties of negotiating safe sex behavior for abused partners. In addition, there are hypothesized but as yet untested relationships between increased HIV transmission and intimate partner violence through intimate partner forced sex, known as a frequent form of intimate partner violence. Forced vaginal sex may cause trauma that increases the chance of transmission. In addition, abused women report forced anal sex as a frequent form of forced sex in violent intimate relationships, and anal sex is known to increase HIV transmission.

We must also consider other direct and indirect forms of violence, especially against women. In the home, within families, many nations presume there is safety for women, but the belief often proves to be false. The trading of girl children for dowries, placing them in arranged marriages at 10, 12, 15 years of age, while they are still developing physiologically, intellectually, and emotionally, increases their risk for violent victimization. The educational process for these child brides is often ended, to say nothing of the fact that in some countries, girls are not sent to school at all. Economic, educational, and health disparities are subtle forms of violence that are too often morally invisible. Women rejected by their husbands or who have been culturally deemed “unmarriageable,” may be beaten, stoned, or forced to commit suicide. Religious excuses are given for these misogynist “rules” while in truth, the major religions do not condone these violent practices. They stem from cultural and patriarchal assumptions and privilege that simply favor males over females, deeming women the property of fathers, brothers, and husbands. Infanticide of girl children has not ceased with the march of modern advancements. Children, especially poor girls whose parents reject them or who run away from untenable marriages fall prey to pimps and purveyors of the flesh trade. Girls and women are sold and traded as slaves, where they face confinement and/or forced sweatshop labor.

Violence has been shown to damage the social fabric of communities and is disruptive to community and family relationships. Intimate partner violence can result in isolation and problems with social integration. Increasingly, intimate partner violence is being shown to jeopardize

abused women's ability to sustain employment and to be a productive member of society. In addition, it is necessary to recognize that when compared to men in the workforce, women are underemployed, undercompensated, and underpromoted. Crucially, in all cultures, they spend many hours doing delegitimized, unpaid labor that sustains children and families. As immigrants and refugees, they often are limited to low-wage work as maids, cooks, and nannies. This economic disparity is one source of violence against women and carries with it health risks that result in limited or no access to health insurance and/or health care. Lack of equity indeed threatens the survival of women and their children. Additional research is now associating women's exposure to intimate partner violence with infants' development. Childhood aggression has been shown to be a predictor of violence in adolescence and adulthood. Both child maltreatment and intimate partner violence are associated with relationship, academic, and employment problems.

The economic costs of violence are staggering and place an enormous burden on national economies and international relationships through increased healthcare and legal costs, absenteeism from work, and lost productivity.[4] The Centers for Disease Control and Prevention (CDC) concluded that the total costs associated with nonfatal injuries and deaths due to violence in 2000 were more than $70 billion in the United States alone.[5] The majority of this cost was due to lost productivity, but an estimated $5.6 billion was spent on health care for more than 2.5 million injuries that were due to interpersonal and self-directed violence.[5] The WHO also concludes that the knowledge about economic consequences of violence is limited due to the scarcity of studies in these areas from low- and middle-income countries that are known to be disproportionately affected by violence.[1] In 2008, the United Nations Secretary-General launched a global campaign, "Unite to End Violence Against Women," and this initiative has set internationally agreed-upon objectives, which include eradicating poverty, achieving universal gender equality in education, and reversing the rate of HIV/AIDS incidence.[3]

IAFN believes that any effort to improve the health of women must also address the violence that affects as many as one in three women globally.[6] Furthermore, violence prevention and intervention efforts must be expanded using an ecological perspective that considers individual, family, community, systems, and societal factors.[1,6,7]

In summary, the National Institutes of Health Women's Health Research Agenda has the opportunity to plug a gaping hole in the NIH research agenda proposed to date and to address a major cause of morbidity and mortality in women—violence against women. The evidence is clear and the momentum is growing, not only in the United States, but internationally through organizations such as WHO and the United Nations. We want to add our voices to the chorus and recommend that the NIH research agenda add the focus area of violence against women. The sections under this focus area should include ecological 1) study of prevention efforts; 2) study of evidence–based interventions; 3) study of processes and programs; and 4) study of the medical sequelae of violence against women in order to facilitate the prevention, intervention, treatment, and mitigation of violence against women and their children.

Thank you for consideration of IAFN's proposals and we remain available to this important initiative as internationally recognized experts on the health of women following violence.

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SUE GOLDSTEIN

International Society for the Study of Women's Sexual Health

Need for Research and Education in Women's Sexual Health

My name is Sue Goldstein. I am here today representing the International Society for the Study of Women's Sexual Health (ISSWSH), an international, multidisciplinary, academic clinical and scientific organization, whose purposes are to provide opportunities for communication among scholars, researchers, and practitioners about women's sexual health; to support the highest standards of ethics and professionalism in research, education, and clinical practice of women's sexual health; and to provide the public with accurate information about women's sexual health. In addition, I have had the privilege of interviewing countless women with sexual dysfunction for a book I coauthored 2 years ago and in my capacity as clinical trials coordinator of a sexual medicine practice.

The World Health Organization claims all people are entitled to health; this includes sexual health. For many years, this meant reproductive freedom for women. While we applaud the necessity for safe and effective contraception, freedom from abuse, and availability of care for basic medical needs, a growing number of women are complaining of sexual health problems. This is not merely a lifestyle issue, but a quality-of-life problem that extends far beyond the bedroom. There is no longer any debate about the negative effects erectile dysfunction

can have on a man with regard to his self-esteem, his relationships with loved ones, and in the workplace. Yet for generations, when women have the courage to share their sexual health problems with providers, they are told "it's all in your head" or "relax, go away for the weekend." Everyday women are being denied the benefit of health care.

Why is this happening? The simple answer is knowledge, but that is not so simple. Our organization was founded because so many researchers and providers knew little pieces about women's sexual function, but no one could see the whole picture. By sharing information both formally at our annual meetings and informally on our listserve, we are starting to piece together parts of the puzzle. We offer educational programs annually in the United States for clinicians in addition to those held concomitantly with our annual meetings, but we cannot hope to educate all the primary care physicians, family practitioners, internists, and gynecologists who are the primary caregivers of women. Residency programs need to recognize the importance of sexual health to women and need to incorporate what evidence-based information is currently available into their training programs.

The biggest problem we have, however, is a universal paucity of support for the research in this field. This includes moral and financial support. Every time someone calls the treatment of sexual dysfunction in women medicalization, we in this area feel the pinch. A total of 43 percent of women have sexual health concerns. Approximately 16 percent of women meet the criteria for a diagnosable sexual dysfunction. Members of ISSWSH see these women in their offices and clinics every day. Women don't seek treatment for an ailment concocted by the pharmaceutical companies. They want help because they are in pain, both mentally and physically.

Sexual dysfunction involves problems with sexual desire, arousal, orgasm, and/or pain. To understand these, one has to step back a little and examine the physiology. The genital tissues are supported by both androgen and estrogen; therefore, blood hormone levels of each should be in the normal range to maintain healthy genitalia. Our first problem here is assessing normal values. Since few people attended to women's sexual health, normal ranges were determined based on healthy women who were not necessarily sexually healthy. The Princeton Consensus Conference developed a solution to that problem by eliminating the lowest quartile of any given lab range for estrogens and androgens. Once this hurdle of normal lab ranges is overcome, we must address specific dysfunctions.

Desire may be centrally controlled—that is, in your brain—but a biochemical imbalance is not necessarily a psychological problem. When this was discovered about depression, the taboo of that mental illness was lifted and research funds poured into understanding it better. Currently, research dollars to better understand desire are limited. Evidence points to alleviation of desire problems through administration of centrally acting drugs such as wellbutrin and flibanserin, which is currently being studied. Testosterone also influences desire and that is being studied in women with libigel. Evidence will be shown through clinical trials of the effectiveness of these medications, but there is still controversy about their use. Women with sexual dysfunction today currently use agents such as wellbutrin and testosterone, but these are off-label FDA-approved drugs, not indicated for low desire.

While having desire may seem like an irrelevant issue, the lack of it can and does destroy relationships every day. Who is to say if a woman were more interested in a sexual relationship with her spouse that a divorce might not be averted? Divorce is an epidemic in this country. Desire issues are also prevalent among women who experience pain. Please think about it—who wants to have sexual intercourse when it hurts every time you have sex?

As scientists and educators, we ask about arousal next. For a woman who wants to have intimate relations, but who has no physiologic response, frustration is a mild word. We have some initial research into women's arousal response, but still know very little. And we have only recently come to the conclusion that women may have arousal in the genitals with or without concomitant feelings of arousal in the brain, and conversely, may sense arousal without her genitalia actually undergoing physiologic engorgement. This is a huge hole in our understanding of women's sexual physiology. This lack of knowledge is particularly poignant for those women with persistent genital arousal disorder (PGAD), where a woman has unresolving, unrelenting sensations of genital arousal not associated with sexual thoughts or feelings. This disorder all but paralyzes women as they lose their ability to focus, have difficulty traveling, making work all but impossible, and when help is sought, are either told there is nothing that can be done, or that "I wish I had that kind of problem." Trust me, you wouldn't wish PGAD on your worst enemy.

For a woman who cannot reach orgasm, she may suffer from frustration, embarrassment, and discomfort, to name a few. There is a biochemical release that occurs either with or after orgasm that provides relaxation and helps with mood and self-assurance. While all this may seem frivolous to the physician battling AIDS, let me reassure you that women with any or all of these problems often become antisocial with an inability to maintain relationships, become depressed, and have significant body-image issues.

The most heart-wrenching problem in the sexual health realm is that of sexual pain. Have you ever seen a woman married for several years, but unable to consummate her marriage because intercourse is too painful? Then forced to get a divorce because her religious beliefs do not allow the husband and wife to remain together in an unconsummated marriage? Or a couple desperately wanting children who cannot have intercourse because it is too painful… we see this far too often in our practices. Sometimes merely restoring the hormonal milieu to a normal level is all that is required, but the Women's Health Initiative (WHI) make many fearful of endogenous estrogen and the Endocrine Committee Guidelines make practitioners hesitant to prescribe testosterone.

There are two issues at play here. First, we need to educate both practitioners and the public that the estrogen used in the WHI study was not bioidentical, and one cannot extrapolate results from studies using estrogen derived from horse urine. Second, the negative findings that forced the study to be stopped were in the cohort of women who were approximately 10 years post-menopause when hormone therapy was initiated, and among those women closer to menopause at the start of therapy, there was no significant difference in occurrence of breast cancer or stroke. The disservice done by both the report and the press is that women who had been on hormone therapy or who could potentially benefit from it became fearful

of estrogens. It behooves your office and organizations like ISSWSH to explain the need for estrogen and appropriate treatment paradigms.

As for the endocrine guidelines for testosterone use, the clinicians and researchers who developed these had little or no involvement in the care or study of sexual health or sexual physiology. Their fear that testosterone would cause breast cancer has never been shown—as a matter of fact, the initial treatment for metastatic breast cancer was testosterone. Their belief that women would become hirsute, have lower voices, and all that comes with masculinization is unfounded because testosterone blood levels are only being returned to within a normal range. Due to the lack of understanding on the part of the endocrinologists, they chose to simply ignore sexual health needs.

I stand before you today asking you to no longer ignore those needs. If I had cancer, you would not turn your back on me. If I had heart disease, you would not turn your back on me. If I had depression, you would not turn your back on me. So what gives our healthcare system and the United States Government the right to turn their back on me when I tell you I have sexual dysfunction? And I will openly admit to more than 6 years of being treated for my sexual dysfunction.

One irony is that many of the sexual problems experienced by women are, in fact, iatrogenic. We see women who have lost part of their womanhood to breast cancer or uterine cancer. The treatments they receive to keep them alive devastate their bodies in other ways. For many of these women, quality of life becomes extremely important, and sexual health is a big part of that picture. Working closely with their oncologists, sexual medicine providers can help restore function—labias can regrow and vaginas can regain rugae and elasticity—allowing these cancer survivors the dignity of feeling like women again with a modicum of sexual function.

Physicians have innocently caused a generation of women to have sexual health problems through lack of knowledge. When prescribing medications containing ethinyl estradiol, the artificial estrogen found in hormonal contraception, do physicians ever stop to think about the consequences of the rise in sex hormone–binding globulin (SHBG)? The SHBG has a strong bond with testosterone, thereby depleting the testosterone circulating in the blood available for genital health, bone density, and muscle strength, not to mention energy and mood. The ethinyl estradiol also stops the ovaries from producing hormones for the time being, including natural estradiol. This combination of no estrogen and no androgen is turning our young women into postmenopausal beings with all the commensurate problems, including depression, low energy, loss of libido, resorption of the labia, and sexual pain. We don't even give women the right to complain about these issues. They are told they look normal, so it must be in their head. I cannot tell you how many times we hear the same story from women of all ages. And when their complaints are heard, they are often put on a selective serotonin reuptake inhibitor that only intensifies their problems.

What we know about physiology of sexual function is minimum compared to what we know about men's sexual function. But we women are no longer second-rate citizens in every other aspect of health care. We cannot hope to understand pathophysiology without having an

understanding of "normal," for lack of a better term. With a better understanding, we cannot only help women suffering, but provide prophylaxis to those who seek it. Sexual dysfunction is a biopsychosocial problem that needs biopsychosocial treatments. We cannot make a tacit statement that it is purely psychological until proven otherwise, which is the statement from so many professionals and nonprofessionals, and implied when the Office of Research on Women's Health ignores sexual health.

I started by saying that women's health often means reproductive freedom. Do not get me wrong—we are not advocating women being barefoot and pregnant. We are asking for support to address the issues of sexual health instead of ignoring them. We need to better understand mechanisms of action of sexual desire, arousal, orgasm, and pain problems in order to find better solutions and begin prevention. We need to better educate those men and women currently caring for women with these problems. And we need to provide a world in which it is acceptable to request help for sexual health issues without being told there is nothing that can be done. What we do know is that sexual health complaints may be indicative of a larger problem, be it low androgens or estrogens, a thyroid imbalance, pelvic floor dysfunction, or a myriad of other issues that might otherwise go unaddressed. We also know that women suffering from sexual dysfunction find those negative affects reaching into all aspects of their lives as human beings, affecting their relationships and their productiveness, coloring them beige, as one woman once told me.

On behalf of the International Society for the Study of Women's Sexual Health, I would like to request that the Office of Research on Women's Health include sexual health as part of their platform, and put forth Requests for Proposals in the various aspects of sexual health so that our daughters and our granddaughters do not have to suffer the way our mothers and grandmothers did. I am not asking for the world, only a little corner of it. The members of ISSWSH are committed to understanding all aspects of women's sexual function and dysfunction. We are asking you to consider including this as part of women's health as your office moves forward supporting health care, and to provide financial support for those of us who are best equipped to research this aspect of women's health.

DEB LEVINE, M.A.

Internet Sexuality Information Services (ISIS Inc.)
Women's Health and Information Technology

As Executive Director of ISIS, Inc., based in Oakland, CA, I know well the power of people and technology to develop and deliver innovative services for sexual and reproductive health, locally, nationally, and internationally.

The years 2009 to 2013 present a critical time of opportunity for the intersection of health information technology and women, children, and family planning issues. While many people think the most at-risk or vulnerable population are disconnected, it's time to rethink those assumptions. As of December 2008, 75 percent of adult women in the United States use the Internet regularly, and 41 percent of all people aged 65 and over go online. Seventy-seven

percent of Caucasians, 64 percent of African Americans, and 58 percent of English and Spanish-speaking Latino/as are online. In addition, 57 percent of people earning $35,000 a year or less are online. And these numbers are steadily increasing.

Knowing that women, girls, and families increasingly rely on online, mobile, and new media technology to support healthy lives and relationships, I'd like to offer five "technology wellness" elements for women's health:

1. Engage Our Communities in Our Work

Parents and daughters bring more and require less than we think for tackling tough problems. By incorporating their experiences, ideas, and energy—not simply substituting expert opinion, judgment, and frustrations—we can tackle seemingly impossible challenges in women's health in culturally appropriate ways.

2. Reintroduce Relevancy

Just as we engage those whom we serve, we must also ensure the priority status of women's health in all disciplines of health and technology. Sexual and reproductive health, whether in community-based research or international medical discussions, matter in the context of health IT, health 2.0, health leadership, and health insurance. Every discussion about health and health IT needs to include women's nutrition, fitness, mental health, hygiene, and sexual health.

3. Develop Accessible and Affordable Options

Technology provides a starting point for easy, cost-effective prevention, education, and disease management solutions. From here, we can increase access for women to free and low-cost testing and diagnostic services, mobile and text-messaging reminders, location-based tools to bridge work and childcare with health needs, and critical information to ensure informed health consumers.

4. Evaluate Innovatively

It is our duty to understand what women and girls are doing online, and adapt our methods to use new media and technology to reach them on their turf and their own terms. We need our peer reviewers to become risk takers, to understand that there are research models out there based on proven methods that can be adapted for modern Internet and mobile interventions. We need to have a plan for new media and technology strategies, and design bold new ways to measure their effectiveness and disseminate results.

5. Effectively Advocate

Coordination and collaboration, instead of battles over funding, naming rights, turf, and credibility, strengthen the fight for those women we claim to serve. Online or offline, sexually transmitted infections, human immunodeficiency virus, unplanned pregnancy, and healthy sexuality all affect women's health—and affect our fertility, economic status, educational level, and family lifestyles. There will be enough room for all the actors to fight the many battles ahead.

Technology improves traditional women's health services through increased capacity and enhanced access—informing, educating, and empowering women as consumers and advocates. Technology, however, won't reveal answers without input. Used effectively, it can increase access to healthcare, offer options that meet the pace of women's lives, and sharpen the questions a woman might ask when they do get to talk to a health professional. Whether the next few years produce opportunity or uncertainty depends on how well we—researchers, clinicians, decisionmakers, and innovators—work together to meet women's health and wellness needs and learn about and evaluate all the available tools to create positive change.

MARIA CORA, M.A.

Lesbian Health & Research Center at UCSF

Lesbian Health Is Women's Health

This testimony is presented on behalf of the Lesbian Health & Research Center (LHRC) at the University of California, San Francisco (UCSF). LHRC is dedicated to improving the health and well-being of lesbians, bisexual women, transgender people, and all families. To accomplish this mission, LHRC develops collaborative, precedent-setting programs, community initiatives, education and training, leadership development, and research. LHRC is the only organization housed within a world-renowned health science institution with this mission. It is a joint project of the UCSF Schools of Nursing and Medicine.

The health obstacles faced by lesbian/gay/bisexual/transgender/queer/questioning (LGBTQQ) people, as well as our strengths and resiliency in the face of multiple oppressions, remain largely unstudied. As a result, we lack data about our community, and little evidence-based information exists to guide the design of effective public health policy and the provision of culturally appropriate healthcare services. Despite increasing recognition of unique LGBT health issues, there is a lack of representative, population-based data that describes the full extent of LGBT people's health experiences. This "invisibility in research" reinforces societal stigma and marginalization for this population. LGBT people face a number of health disparities compared to the majority, including experiencing reduced access to health care, obtaining fewer cancer screenings, greater tobacco use, substance abuse, obesity, violence, depression, and suicide. The magnitude of these health disparities warrants scientific attention. LGBT people may also differ from the majority in other, positive ways. Recent research shows that same-sex couples report greater relationship quality, compatibility, and intimacy, and lower levels of conflict compared to their straight peers.

There are an estimated 8.8 million LGB adults in the United States, which is comparable to the population of North Carolina. This number is likely an underestimate of sexual and gender minorities since it does not include youth or transgender people. The estimated LGBT proportion of the general population varies by location but is comparable to other minority groups, likely greater than Native Americans and Asians (<1 percent and 4 percent of the U.S. population, respectively) but less than African Americans (12 percent) and Hispanics (15 percent).

Sexual minority health is an emerging field and the health issues specific to LGBT people are gaining increasing recognition. Sexual orientation has been included in 10 of the 28 focus areas for Healthy People 2010. A companion document produced by the Gay and Lesbian Medical Association in collaboration with community health experts further explores the HP2010 issues relevant to LGBT people. However, significant gaps in knowledge exist that warrant immediate study and consideration. LHRC recognizes that these gaps can be addressed by ensuring LGBT inclusion in demographic data gathered by researchers. Therefore, LHRC recommends all researchers routinely collect sexual orientation and gender identity data as part of their research protocols. The American Medical Association, American Public Health Association, and National Coalition for LGBT Health also recommend that research include sexual orientation and gender identity as key demographic variables, as research that assumes a heterosexual norm may not be generalizable to sexual and gender minorities. Several large national surveys now collect sexual identity data, including the National Health and Nutrition Examination Survey (NHANES), the Nurses Health Study II, and the National Alcohol Survey. Although the Behavioral Risk Factor Surveillance System (BRFSS) does not assess sexual orientation in its core questions, six States and three localities have collected sexual orientation data through their optional modules (CA, CT, MA, ND, OR, VT; San Francisco; New York; and Fulton County, GA). The California Health Interview Survey (CHIS), the largest State health survey in the United States, now collects sexual-orientation data.

LHRC has already advanced the concept of a more rigorous scientific standard in the demographic section of all general research studies and governmental surveys to be inclusive of the LGBT population, thereby moving closer to achieving the goal of expanding the conventional research paradigm to routinely identify and be inclusive of the LGBT population. We initiated a pilot project with the UCSF Institute for Health & Aging in which they agreed to incorporate a tested question regarding sexual orientation and gender identity in the demographic section of their research endeavors. LHRC produced a briefing sheet to serve as a guide for the IHA faculty. As a successful result of this advocacy, the Alzheimer's Disease Research Centers of California (ARCC), a program funded by the California Department of Public Health Services, included a sexual-orientation item in their data collection instrument starting in June 2008. There are 10 ARCCs located throughout the State, which collectively serve approximately 1,000 individuals per year. It is our hope that this model of inclusive research will be broadly replicated and incorporated into all curricula used to educate student researchers. LHRC is advocating that all health science institutions adopt this strategy, beginning with the examination of health disparities and expanding to encompass all research protocols.

In summary, LHRC strongly recommends not only the routine inclusion of demographic questions on sexual orientation and gender identity in research protocols going forward, but we also recommend routine inclusion of teaching on LGBT health to all individuals training to become healthcare workers. Model curriculum on LGBT health and LGBT mental health exist and need to be routinely taught to medical, dental, pharmacy, and nursing students, plus those pursuing postgraduate training (such as residencies). Part of the work of LHRC going forward will be the creation of a National Lesbian Health Agenda (NLHA). This agenda will be used at the Federal and State levels and will dovetail with efforts to generate a national women's health agenda and a national LGBT health agenda. Input for the NLHA will be sought through

community surveys, focus groups and interviews with researchers, community leaders, academics, and healthcare providers. We are here today because LHRC's overall mission, aimed at the population of lesbian, bisexual, and transgender women, makes us especially interested in inclusion of these populations within the broad focus on women's health.

SARAH JANSSEN, M.D., PH.D., M.P.H.

Natural Resources Defense Council

Hormone Disruptors and Women's Reproductive Health: Recommendations from the Women's Reproductive Health and the Environment Workshop

I am submitting these comments on behalf of the Natural Resources Defense Council (NRDC). NRDC is a nonprofit, nongovernmental advocacy organization with more than 1.2 million members and online activists. We have offices in New York; Washington, DC; Chicago; San Francisco; Santa Monica; and Beijing. Our staff of nearly 400 employees consists of attorneys, scientists, physicians, and policy experts who apply our expertise to ensure a safe and healthy environment for all living things. I am a physician and scientist in the Health Program of NRDC, which focuses on a number of different threats to women's reproductive health, including pesticides, endocrine-disrupting chemicals, heavy metals, and other pollutants found in the air we breathe, water we drink, food we eat, and consumer products we bring into our homes. A major part of our work involves staying abreast of the latest scientific advances so that scientific findings are appropriately considered and incorporated into public health policy decisions.

In addition to my affiliation with NRDC, I am an Assistant Clinical Professor in the Department of Medicine at the University of California–San Francisco (UCSF), and was a participant and discussant in the 2007 UCSF–Collaborative on Health and the Environment (CHE) Summit.

The 2007 UCSF–CHE Summit highlighted the evident need for increased research on environmental influences on female reproductive disorders and disease. After the Summit, a collaboration was formed, which led to the Women's Reproductive Health and the Environment Workshop in January 2008 at Commonweal in Bolinas, California.

This invitational workshop had three goals:

- Assess the key science linking environmental contaminant exposures to reproductive health outcomes currently being reported at ever greater rates in women and girls. In particular, assess xenobiotics and phytoestrogens and the deleterious effects of these compounds on normal ovarian, uterine, breast, and hypothalamic/pituitary function.
- Identify research directions that will fill current gaps in the scientific understanding in this field.
- Translate this information for a lay audience of journalists, policymakers, NGOs, community groups, and others who can develop a strategy for prevention and intervention.

The workshop brought together 18 leading researchers specializing in issues related to endocrine-disruption and women's health to conduct a literature review on endocrine-disrupting

compounds (EDCs) and female reproductive health outcomes. The results of the workshop were published in the October 2008 issue of *Fertility and Sterility* and was titled Female reproductive disorders: The roles of endocrine-disrupting compounds and developmental timing.

The workshop proceedings have been translated into a lay form in the report, *Girl, Disrupted: Hormone Disruptors and Women's Reproductive Health*. These reports are available free of charge on the CHE Web site.

The key finding of the workshop was that exposure to endocrine-disrupting compounds—particularly during fetal development and early life—may lead to female reproductive health problems, such as uterine fibroids, endometriosis, polycystic ovarian syndrome, early puberty, and others. Perhaps most importantly, the workshop scientists outlined a comprehensive research agenda to fill critical information gaps in women's environmental reproductive health science, which can be found in both the scientific report and the lay document publication.

- The need to prioritize research funding to study the effects of hormone disruptors on women's health. Most of the research to date has been limited and focused on health outcomes in males, leaving large gaps in our understanding of how females may be impacted.
- Improve health tracking systems. Currently, the systems that track rates of various health problems are inadequate. In order to understand the full impact of hormone disruptors on human health, particularly women's health, we need to track female reproductive health trends.
- Assess chemicals for their hormonal and reproductive health effects. Knowledge about the hormone-disrupting potential of most of the more than 80,000 industrial chemicals in production is very limited. These chemicals also have not been systematically assessed for their effects on reproductive health. Since industrial chemicals occur in nearly everything we buy and also are found in food, air, and water, this is a crucial step. Increasing the use of in vitro and in vivo testing can help identify potentially harmful chemicals.

Investigate the impacts of hormone-disruptor exposure during critical windows of vulnerability. The major impediment to understanding whether hormone disruptors influence female reproductive disorders is the lack of information linking fetal exposures to adult-onset reproductive disorders in humans. We have come to realize over the past decade that the embryonic/fetal origin of adult disease is a likely phenomenon and requires significant research and a change in our approach to linking disease with exposure. We need to carefully examine human exposures—especially during prenatal, newborn, and pubertal development—and consider whether these exposures relate to particular reproductive health disorders later in life. Moreover, the hypothesis that secondary adult exposures may initiate or exacerbate conditions that were set up prenatally requires further investigation.

- *Support long-term studies*. Because hormone disruptors can have lifelong impacts, it is especially important to initiate studies tracking women's health over large spans of their lives and to evaluate longer periods of time in animal studies. This will help us understand long-term and multigenerational effects.

- *Encourage collaboration*. Currently, most reproductive disorders are studied in isolation. This approach yields detailed information about single disorders, but it neglects commonalities that might exist among multiple disorders. By pooling data such as tissue samples and study results, a broader picture might emerge.

Following the January 2008 meeting, the workshop scientists got together in a series of meetings to brainstorm ways in which these research gaps can be filled in a multidisciplinary and collaborative way. The consensus idea that came out of these meetings was the concept of a virtual consortium, or "lab without walls." Our proposal is to construct a Virtual Consortium For The Environment and Women's Reproductive Health. It has an overall structure that is not centered at one institution, but rather a consortium that takes advantage of the unique contributions each institution can make to the whole, thereby creating something that cannot be done at any one place or through any one RO1. We think this is a way to creatively leverage our expertise across the country with minimal funding input, rather than spending millions of dollars to create new centers.

Our teams of investigators are developing several truly collaborative, transdisciplinary, and translational working groups focused on a selection of female reproductive disease areas, including uterine disorders such as uterine fibroids and endometriosis, and ovarian disorders such as polycystic ovarian syndrome and premature ovarian failure. We believe the virtual consortium model being developed by this research team will add greatly to our understanding, and ultimately prevention, of women's reproductive health disorders, as well as address the public need to raise awareness around these disorders and the grave health disparities that exist.

YALI BAIR, PH.D.

Planned Parenthood Affiliates of California

Planned Parenthood Affiliates of California Research Recommendations

Introduction

Planned Parenthood Affiliates of California (PPAC) represents nine separately incorporated Planned Parenthood affiliates throughout California on statewide governmental issues. We are 1 of 21 State public affairs offices of Planned Parenthood Federation of America.

PPAC actively follows State and Federal legislation in a number of public policy arenas and promotes education, counseling, research, and clinical services in the field of reproductive health care. We monitor administrative, legislative, and regulatory actions, including local, statewide, and Federal initiatives. PPAC also engages in electoral or political activity as allowed by law and provides technical assistance to affiliates regarding Government healthcare programs.

PPAC's mission is to create a personally and politically safe climate in which individuals have universal and unfettered access to sexual and reproductive health services and are free to follow their own beliefs, values, and moral code when making decisions about these services.

Incorporated in 1974, PPAC has been a driving force at the Capitol regarding reproductive health care and reproductive freedom issues. It was the first such organization of its type in the Planned Parenthood Federation of America family and served as a model for other States. It was created because the Planned Parenthood organization in California saw the need for a common policy on information and education, fundraising, public relations, public education, and public affairs.

PPAC's vision and leadership has spurred lawmakers to enact legislation that makes California the number one State in the funding of family planning and other reproductive healthcare services. PPAC played a key role in improving access to reproductive health care, reducing unintended pregnancy and sexually transmitted infection rates in California.

PPAC Research Recommendations

Disparities in Disease Outcomes and Access to Care. Planned Parenthood supports research that seeks to reduce socioeconomic, racial, and ethnic disparities in health outcomes and access to care. In particular, our health centers and providers would benefit from research that elucidates the link between socioeconomic status, race and ethnicity, and access to care. In order to best serve low-income communities and communities of color, we must understand the likely barriers to seeking, accessing, and engaging in health care.

Environmental Effects on Reproduction. Planned Parenthood supports healthy sexuality and reproduction and seeks to reduce any impediment to self-determination of reproductive decisions. Environmental effects on reproduction, particularly those that disproportionately affect communities of color, are barriers to reproductive choice and justice. Planned Parenthood supports research that would yield accurate and up-to-date information about risk factors for reproductive harm and limiting exposure to environmental toxins. In addition, research related to environmental policy that specifically addresses reproductive risk would benefit women's health advocates working to develop informed policy in an area with a growing base of scientific knowledge.

Reproductive Technology. Stem cell research is one of the reproductive technologies that will change how we provide reproductive health care in the future. Planned Parenthood supports a research agenda that addresses the health benefits and risks of reproductive technologies. Specifically, we are interested in research that identifies the role of stem cells in gender-related health disparities and reproductive function and outcomes. In addition, research that addresses the health consequences of reproductive technologies that are becoming more commonly available (such as oocyte donation) are critical to inform the development of women's health policy.

Health Technology. Planned Parenthood believes that the role of technology in women's health is an important component of healthcare delivery and personal health management. In the reproductive health arena, privacy of medical information is paramount to our providers and our patients. At the same time, the secure and appropriate use of health information through technology allows us to provide care in a more efficient manner and allows women to play a more central role in their health care. Planned Parenthood supports a research

agenda that incorporates the use of technology in women's health care. In particular, we value research that identifies opportunities to integrate the latest science into health education at the community level and the use of health information technology to provide patients and providers with opportunities to become involved in research studies.

Women in Research. The participation of women in research and in clinical medicine has transformed women's health care. Planned Parenthood believes it is essential to continue this progress by enhancing research about women in science. In particular, we would be interested in models of providers participating in research in clinical settings, the role of women's health researchers in policy development, and opportunities to increase racial and ethnic diversity among women's health scholars.

HIV. Planned Parenthood provides human immunodeficiency virus (HIV) testing for millions of high- and low-risk patients each year. Our organization would benefit from research that addresses barriers to testing, HIV/acquired immune deficiency syndrome prevention education, and community-based models for early testing and prevention.

Intimate Partner Violence and Reproductive Coercion. Planned Parenthood is very interested in research relating to the effects of intimate partner violence on reproductive health behaviors and outcomes, particularly among adolescents. The current research in this area indicates that reproductive coercion and violence have significant health impacts. Further research is needed on the role that counseling and education about healthy relationships and sexuality have on reproductive care and health.

DEBORAH ORTIZ, J.D.

Planned Parenthood Mar Monte

Testimony of Deborah Ortiz, VP of Public Affairs, California, Planned Parenthood Mar Monte Before the NIH Office of Research on Women's Health at the University of California–San Francisco

Dear members of the Congress, Office of Research on Women's Health Committee members, and staff. My name is Deborah Ortiz and I am the California Vice President (VP) of Public Affairs for Planned Parenthood Mar Monte (PPMM). Thank you for allowing me to share our recommendations for future women's research initiatives.

Prior to my role as VP of Public Affairs with Planned Parenthood Mar Monte, I served as a California State Senator and Chair of the California Senate Health Committee. I was honored in 2006 when Governor Schwarzenegger signed my legislation that established The California Environmental Contaminant Biomonitoring Act. That is why I am so proud of Planned Parenthood's unique commitment to educating and empowering communities to understand how environmental contaminants may affect pregnancy outcomes, fertility, and reproductive development of girls. I will share Planned Parenthood Mar Monte's two innovative community initiatives with the panel today.

Planned Parenthood Mar Monte is one of nine California Planned Parenthood affiliates. We serve 27 counties in California and 13 counties in Northern Nevada. In California, PPMM spans the Central Valley from Yuba City and Marysville to Bakersfield, and includes the Silicon Valley and coastal counties of Santa Clara, Santa Cruz, San Benito, and Monterey; and we serve the Sacramento and Sierra Foothill regions.

Our mission is to ensure that every individual has the knowledge, opportunity, and freedom to make every child a wanted child and every family a healthy family.

We consider this mission consistent with the right to healthy pregnancies free from exposure to environmental contaminants that may harm fertility, birth outcomes, and reproductive development in young girls. We also believe that partnerships with public and environmental health communities are essential to achieve our mission.

Our affiliate has had great success educating communities about family planning and sexual health and we decided to increase community awareness about the intersection of environmental exposure and reproductive health. We are in a unique position to know about the threat because our clinicians often see their troubling effects ranging from low self-esteem due to early puberty, to problems conceiving healthy children, to a higher risk for breast cancer in young women.

It is time for more people to know that Planned Parenthood's family planning mission is promoting the health and safety of pregnant women and children. We provide primary and prenatal care to many uninsured families throughout our affiliate. Many work in agricultural communities and in workplaces that expose them and their children to chemicals, pesticides, plastics, perfumes, and sources of endocrine-disruptor chemicals.

We also know that troubling new research indicates that a broad range of chemicals—including many that are associated with everyday products such as household cleansers, flame retardants, personal care and beauty aids, and even plastic water bottles—could have a complex and far-reaching impact on men's and women's reproductive health and fertility and healthy fetal development.

Although most people know someone who has been affected by infertility, birth defects, or other childhood afflictions such as autism, many are not aware of the possible connection to common chemicals in our environment. We believe that once people are aware of the connections, they will be motivated to take action, both personally, to improve their health and the health of their families, and publicly, to ensure better policies for all.

Planned Parenthood Mar Monte's innovative leadership resulted in two initiatives that will educate and empower women and families on how their reproductive health can be affected by their environment. We went into two very different communities with the intent of one outcome: to ensure that every individual has the information on how the environment may affect their health and health of their families.

Today, I would like you to share these two examples that provide a more comprehensive vision of reproductive health and may serve as models for your important work in women's health research initiatives.

From the Personal to the Political

PPMM's first initiative was a Stanford lecture series, "From the Personal to the Political—Reproductive Health and Environmental Toxins." The topics during the three lectures from March to May of 2008 studies early puberty, impacts of chemicals on fertility, and pesticides in playgrounds. PPMM partnered with Acterra and Reproductive Health Technologies Project in this effort.

Those who attended the Stanford educational forums were primarily parents with young children and couples planning to become pregnant. This concern for their children's health generated a large turnout throughout the educational forums on the links between environmental and reproductive health. Our hope is that our series provided the opportunity for participants to translate their education into personal and public actions.

Our goal was to educate these parents and future parents about the growing evidence linking environmental contaminants to reproductive health issues such as fetal development, early puberty, breast cancer, asthma, and the harmful chemicals in cosmetics. We recruited specialists in this field who presented the information in a dynamic and engaging way.

After each event, we encouraged the participants to take some kind of action and to develop effective collaborations between environmental and women's health organizations.

PPMM strongly believes that reproductive health organizations and environmental organizations are stronger and more effective when we work together and that, by working together, we will have more success in reaching new and diverse audiences.

The intersection of reproductive health and the environment provides a unique and valuable opportunity for both the reproductive and environmental health communities to educate women and their families about the harmful effects of environmental contaminants and how to avoid them. In addition, we believe that this issue provides a critical opportunity to work across isolated movements for the long-term success of a progressive movement in this country.

Pajaro Valley Health Action Team

The second PPMM initiative is equally important, although it is underway in a vastly different community within PPMM's service areas. The Pajaro Valley Health Action Team (PVHAT) is based in the Watsonville and Salinas communities of Pajaro Valley. Fewer than 60 miles divide the highly educated, primarily White university community of Palo Alto and poor, Latino, and largely shifting but still agricultural communities of Pajaro Valley that include Salinas and Watsonville.

PP Mar Monte received a 2-year grant from the Community Clinics Initiative (CCI), which is a joint effort of the Tides Foundation and the California Endowment to review the health outcomes of pesticides and agricultural chemical exposure to farm worker families. This unique, community-based collaborative assembled stakeholders to review anecdotal, local, and published data on the effects of pesticide exposure on the reproductive health of farm workers and their families in the Pajaro Valley.

We knew that a true collaborative had to include farm worker, agribusiness, academia, environmental and public health groups, pesticide activists groups, and farm worker advocacy groups in order to successfully begin a conversation about how to measure our assumptions.

Although still in our first year, we are well underway in designing a summit that will share information gathered with the public on data collected and encourage their input to develop a community-driven action plan. Pajaro Valley Health Action Team has focused on building a community-based collaborative to have an informed discussion about pesticide exposure and its effects on the reproductive health of farm workers in the Pajaro Valley of California.

Activity has focused on enlisting community healthcare providers to develop a means of gathering data on reproductive health outcomes associated with pesticide exposure. The program staff continues to meet with local community stakeholders, leaders, and elected officials to advise them of the project and enlist their support and participation. We hired a facilitator, Spanish-language translators, and interpreters for the collaborative meetings as we consider participation by the largely Latino immigrant populations essential to our success. Finally, we are in the process of convening a collaborative planning group to flesh out community input for the structure and content of the meetings.

The collaborative has had three meetings and has tentatively settled on the Center for the Health Assessment of Mothers and Children of Salinas (CHAMACOS) project out of the University of California-Berkeley as its source for data. CHAMACOS staff will be presenting their findings at a day-long working session to be held on June 17 in Watsonville and at that time, the collaborative will also formulate their common vision, with the intention of developing a strategic action plan within the next 2 months for presentation to the public.

PPMM staff are working with an epidemiologist in Santa Cruz County and an analyst with the Monterey County Agriculture Commissioner's office to retrieve data on birth outcomes and pesticide applications in the area. We are proud of our efforts to empower communities with information and opportunities to become advocates in the full spectrum of reproductive rights—from controlling their fertility to establishing the right of farmworker communities to be free from chemical exposure during their pregnancies.

We hope that you will embrace this mission as your own and find ways to fund long-term and meaningful research that will result in policies to protect communities throughout the country. Our hope is that this is the beginning of many opportunities to share the future of women's health research and thank you for your commitment to this work.

JANE HONIKMAN, M.S.

Postpartum Support International

Maternal Mental Health—Moving Forward

Thank you for this opportunity to submit written and oral testimony at the Moving into the Future public hearing at the University of California, San Francisco. I am Jane Honikman, founder of Postpartum Support International (PSI). I have been an advocate for maternal mental health since the 1970s as a result of my own experience. My expertise is in social support and the formation of community-based perinatal peer support, self-help networks. PSI is the world's largest nonprofit organization dedicated to helping women suffering from perinatal mood and anxiety disorders.

Women are at highest risk for depression and anxiety during the childbearing years. These mood disorders not only exact a heavy toll on women and their families, but also yield a legacy of poor outcomes for their offspring. Effective treatments and interventions exist, yet mothers continue to suffer at an unacceptable rate. The outcomes of this psychiatric illness include infanticide, suicide, compromised mother/infant attachments, divorce, and loss of a productive life.

I attended my first scientific conference about maternal mental illness in 1984. It was organized by a San Francisco physician named James Alexander Hamilton. I mention his name for the record because he deserves the credit for bringing childbearing psychiatric illness to our attention. Dr. Hamilton was an associate clinical professor of psychiatry at Stanford University, School of Medicine, and the chief of service, psychiatry at Saint Francis Memorial Hospital, San Francisco when he published his first book on postpartum psychiatric problems in 1962. He was a historian, as well as a clinician and researcher. To put the theme of "Moving into the Future" into perspective, I quote Dr. Hamilton's opening paragraph in his chapter on history.

"The first clinical description of postpartum mental illness was written in the fourth century, B.C., by Hippocrates. In the *Third Book of the Epidemics*, he cited the case of a woman who gave birth to twins, experienced severe insomnia and restlessness on the sixth day postpartum, became delirious on the eleventh day and then comatose, and died on the seventeenth day. Hippocrates speculated regarding the cause of postpartum mental illness, offering two hypotheses: 1) that lochial discharge, when suppressed, could be carried toward the head and result in agitation, delirium, and attacks of mania, and 2) that 'when blood collects at the breasts of a woman, it indicates madness.' These hypotheses were transformed into dogma and were accepted for more than two thousand years."

The 19th century brought a revival of interest in postpartum psychiatric problems. The International Marcé Society is named for a young French physician who put forth a connection between organic changes and the emergence of psychological symptoms in his book published in 1858. This was well before the discovery of chemical or hormonal relationships in the body. More than 100 years passed before medicine took up the debate during the second half of the 20th century. Both international scientific research and public awareness began to increase.

We are making progress. I want to acknowledge the leadership of our Federal Government during this first decade of the 21st century. During 2004, the Health Resources and Services Administration (HRSA) held a Perinatal/Patient Safety Pilot Health Disparities Collaborative Expert Panel meeting, and a National Perinatal Depression Collaborators meeting. This same year, the CDC published a Pregnancy Risk Assessment Monitoring System and Postpartum Depression flyer in June, and in October, Postpartum Support International was invited to join the National Institute of Mental Health Outreach Partnership Program as a member of the National Partnership Network. In 2004 and 2006, State grants for perinatal depression and related mental health problems in mothers and their families were awarded by HRSA. In 2005, HRSA's Maternal and Child Health Bureau Office of Women's Health began developing a Federal booklet on perinatal depression, and in November 2006, it was published. I'm extremely proud to have been a part of these historic contributions for women and their families.

And yet, there are enormous gaps in perinatal mental health services throughout our country and the world. In 2003, I participated in a conference at the University of Pittsburgh called Mothers and Depression: Beyond Talk and Into Action. For 2 days, professionals in several multidisciplinary groups addressed the research literature to translate science into practice and policy. It is clear that maternal mental health is a public health and welfare issue. Some models are now in place delivering effective interventions and treatments, however, they are not universal or uniform. They are rare and random.

Research has shown us who is most at-risk for a childbearing psychiatric illness: those with a personal or family history of mental illness and those with low levels of social support. A pre-conception conversation about mental health and social support should be a routine healthcare practice. Every woman should be screened during her pregnancy and the conversation continued during the entire first postpartum year. Husbands and partners must also be included in this discussion. It is essential to have culturally appropriate educational and referral information, treatment options, and free support services available.

I want to recommend a cost-effective, creative strategy, and innovative way to approach this persistent women's health issue. On page 21 of HRSA's booklet, *Depression During and After Pregnancy: A Resource for Women, Their Families, and Friends,* there is a very short list under "Where Help is Available." Postpartum Support International (PSI) and Postpartum Education for Parents (PEP) are both based in Santa Barbara, CA. PEP has been serving its community for more than 30 years, offering free self-help emotional support to expectant and new parents by experienced parents. Trained volunteers actively listen to concerns and questions through its Warmline and/or parent discussion groups, and refer callers and/or participants to appropriate resources. I believe that a PEP-type model needs to be in every community, worldwide.

Childbearing women and their families need and deserve easy access to emotional support and accurate information on perinatal healthcare issues. Healthcare professionals need a community-based organization where they can refer their patients and clients for peer support. Grassroots self-help, consumer organizations have proven to be a successful way to achieve this. We need to move back to the common sense approach of bringing people together to talk, gain confidence, learn their options, and find professional care when needed. Indeed, it is about moving into the future by using strategies from the past.

RHODA NUSSBAUM, M.D.

Prevention International: No Cervical Cancer

Prevention International: No Cervical Cancer

So much has been learned about cervical cancer over the past two decades: identification of the causative agent and its epidemiology; understanding of the process of regression of low grade neoplasia; appreciation of the significance of persistent infection with the risk of transformation to invasive disease; the rapid development of technology, including modifications of standard cytology collection and preparation; development of sensitive and specific oncogenic human papillomaviruses infection diagnostic; and now vaccination for the strains responsible for 70 percent of significant precancerous and invasive disease. All of these advances in science have further decreased the incidence of invasive cancer and mortality in the developed world.

The reasons for this dramatic impact go beyond technology. Access to screening and treatment of preinvasive lesions, effective public health educational campaigns, development of evidence-based screening, and treatment guidelines have all played a part in the decreased disease burden in the developed world. In the United States, significant disparities in incidence and outcome continue to exist between socioeconomic groups. Even these pervasive markers of healthcare injustice are decreasing and outcome data are more comparable between groups as the science, access, and infrastructure are advanced.

But disparities in the burden of this disease between the developed world and areas of the globe now referred to as “low resource” is staggering and unacceptable. This has led to abundant research and publication. This work has been sponsored by generous private funders such as the Bill and Melinda Gates Foundation via the Alliance for Cervical Cancer Prevention; by international consortiums such as the International Agency for Research on Cancer of the World Health Organization; by professional associations, academic institutions, and numerous nongovernmental organizations both large and small, working in Africa, Asia, and Central and South America with a literature spanning more than a decade.

Yet no sustained decrease in cervical cancer incidence and mortality is demonstrable in these “low resource” nations.

Is the problem a lack of adequate technology? One would think so after reviewing the abundant literature comparing specificity and sensitivity of cytology versus visual inspection of the cervix, and most recently with HPV testing.

Is the problem a lack of money? One would again think so after reviewing the many cost comparisons between one screening protocol and another.

Is the problem a lack of sociopolitical will? One would think so after experiencing the low value placed on women, especially postreproductive-aged women, in many of the cultures and countries with the highest incidence of the disease.

Is the problem a lack of systemic analysis in the appropriate unit of society: village, regional, national, or multinational level? One would think so after examining the great diversity of medical infrastructure that exists from one area to the next.

Is the problem a lack of perspective or too narrow a focus? One would think so after reviewing the studies, letters, and responses to letters in professional journals. Pathologists argue for the superiority of cytology-based programs. Public health professionals argue for low technology programs like VIA (Volunteers in Asia). Comparison of new technologies such as the human papillomaviruses polymerase chain-reaction testing, conducted with large numbers of women, but over a relatively short period of time, led to a recommendation of the further development of and widespread adoption of this as the best strategy. Development of a vaccination is proposed as the preferred strategy, even before long-term studies demonstrate long-term efficacy.

Each of the strategies to attack and decrease cervical cancer incidence in the developing, low resource world has its unique contribution and benefit. On-the-ground research on integration of practice and protocols using different screening technologies and instituting vigorous quality control review is what is needed in the women's health research agenda for the next decade.

Prevention International: No Cervical Cancer, PINCC, is a 501(c)3 organization founded by Dr. Kay Taylor, an obstetrician/gynecologist who retired from her practice in the Bay Area several years ago. She was driven to address the unequal burden of cervical cancer in women in the developing world. After reviewing the literature and with no particular focus, bias, or affiliation with large funders, she developed a program of training local healthcare providers using technologies available, affordable, and appropriate for the area. The emphasis is on training and education. The emphasis is on outcome. The program utilizes VIA where appropriate, cytology when VIA is inadequate, and insists upon a cervical biopsy whenever destructive technologies (cryotherapy) are used. The program involves one-visit screening and treatment where possible, and trains physicians in loop electrosurgical excision procedure, which may be the ideal intervention based on lesion characteristics and the availability of electricity. All-volunteer teams of physicians, nurses, educators, and lay people return to each training site every 6 months until the local healthcare personnel and infrastructure can continue to screen, treat, and carry out quality control independently. PINCC has worked in Central America and Africa and will begin trainings in South India this summer.

Future priorities for women's health research for the National Institutes of Health must include funding and support of research in prevention of cervical cancer. Continued development of technologies in the area of vaccination and cheaper and more rapid HPV identification are one small facet of this campaign that will be well funded by others. It is the integration of technologies into processes matched to the needs, culture, and resources of the region that need to be carried out in the coming decade. Evaluation of strategies for assessment of local and regional infrastructure, educational, and cultural readiness to be followed by the design of flexible programs stressing training, resources, quality control, and sustainable deployment will be imperative. Scalable programs that can influence populations will pay off as the disease burden is decreased and the numbers begin to approach what has been achieved in high-resource areas of the globe.

This conference inviting public input recognizes the vast pool of knowledge, innovation, and commitment that exists in this country and is ready to be tapped and organized into a coordinated set of research priorities. This call for public input represents the humble request of one of the premier research organizations in the world to all organizations large and small, who wish to promote justice and better health throughout the world.

We thank you for this opportunity and anticipate the results of this work. We look forward to celebrating the marked decreases in incidence, morbidity, and mortality of cervical cancer in the next decade.

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ROHAM ZAMANIAN, M.D.

Pulmonary Hypertension Association

Pulmonary Hypertension in Women

Thank you for the opportunity to provide today the perspective of the Pulmonary Hypertension Association on one important area of investment for the Office of Research on Women's Health.

I am honored today to represent the many thousands of Americans who are fighting a courageous battle against a devastating disease. Pulmonary hypertension (PH) is a serious and often fatal condition where the blood pressure in the lungs rises to dangerously high levels. In PH patients, the walls of the arteries that take blood from the right side of the heart to the lungs thicken and constrict. As a result, the right side of the heart has to pump harder to move blood into the lungs, causing it to enlarge and ultimately fail.

PH can occur without a known cause or can be secondary to other conditions such as collagen vascular diseases (i.e., scleroderma and lupus), blood clots, human immunodeficiency virus,

sickle cell, or liver disease. Patients develop symptoms that include shortness of breath, fatigue, chest pain, dizziness, and fainting. Unfortunately, these symptoms are frequently misdiagnosed, leaving patients with the false impression that they have a minor pulmonary or cardiovascular condition. By the time many patients receive an accurate diagnosis, the disease has progressed to a late stage, making it impossible to receive a necessary heart or lung transplant.

PH occurs in individuals of all ages, races, and genders. However, women are more than twice as likely as men to develop PH. Women most often develop PH during their childbearing years. Pregnancy can be a painful subject for PH patients because it is associated with life-threatening risks for both the mother and baby. Survivability for PH patients carrying to term is 50 percent.

PH is chronic and incurable, with a poor survival rate. Fortunately, new treatments are providing a significantly improved quality of life for patients. Recent data indicate that the length of survival is continuing to improve, with some patients managing the disorder for 20 years or longer.

Nineteen years ago, when three patients who were searching to end their own isolation founded the Pulmonary Hypertension Association, there were fewer than 200 diagnosed cases of this disease in the entire United States. It was virtually unknown among the general population and not well known in the medical community. The three patients' desire to change this bleak picture led to their establishment of the Pulmonary Hypertension Association (PHA), which is headquartered in Silver Spring, MD.

Today, PHA includes the following:

- More than 10,000 patients, family members, and medical professionals as members and an additional 36,000 supporters and friends
- A network of more than 200 patient support groups
- An active and growing patient-to-patient telephone helpline

Three research programs that, with partnerships with the National Heart, Lung, and Blood Institute and the American Thoracic Society, have directed more than $7.5 million toward PH research.

- Numerous electronic and print publications, including the first medical journal devoted to pulmonary hypertension, which is published quarterly and distributed to all cardiologists, pulmonologists, and rheumatologists in the United States
- A Web site dedicated to providing educational and support resources to patients, medical professionals, and the public that, over the past decade, has grown from 600 visits a month to between 270,000 and 390,000 visits per month

The Pulmonary Hypertension Community

I would like to share with you the stories of two remarkable PH patients, Emily Stibbs and Charity Tillemann-Dick. Emily's and Charity's stories illustrate the impact of pulmonary hypertension not only on PH patients, but also on everyone who care about them.

When their daughter, Emily, was 5 years old, Jack and Marcia Stibbs noticed that she could not keep up with the other children in the neighborhood. She seemed to lack the energy and strength to run and play. This condition worsened to the point where she would have to stop and rest after coming down the steps in the morning. Jack and Marcia noticed that when she was sitting on the bottom step in the morning, Emily's lips appeared to have a bluish color.

After pressing for an answer to these problems for several months, Emily was finally diagnosed with pulmonary hypertension and the doctors told the Stibbs family that her probable remaining lifespan was 3 years.

Charity Tillemann-Dick's diagnosis with pulmonary hypertension took not months, but years. When Charity was in her late teens, she had the opportunity to travel abroad and share her considerable talents as a budding opera singer at her grandfather's 75th birthday party in Budapest. Just before the performance, Charity collapsed, but the episode was explained away as a case of nerves.

Over the next few years, Charity continued to have occasional fainting spells as well as a progressive loss in energy. She was diagnosed as being everything from out of shape to anemic. When Charity finally received an accurate diagnosis, her PH had progressed further, and was therefore more difficult to treat than it would have been if she had been diagnosed while the disease was in its early stages.

I am happy to report that, with treatment, Charity has continued to live a full and accomplished life, including performing at several world capitals. Emily, too, has outlived her 3-year prognosis by 7 years and continues to thrive. There is still, however, no cure for pulmonary hypertension. Each day, courageous patients of every age lose their battle with PH. Thanks to congressional action, and to advances in medical research largely supported by the National Heart, Lung, and Blood Institute (NHLBI) and other Government agencies, Emily and Charity have an increased chance of living with their pulmonary hypertension for many more years. However, additional support is needed for research and related activities to continue to develop treatments that will extend the life expectancy of PH patients beyond the National Institutes of Health (NIH) estimate of 2.8 years for 50 percent after diagnosis, and to raise awareness of this rare, deadly condition.

Recommendations

In December 2006, the NHLBI and the NIH Office of Rare Diseases cosponsored a 2-day scientific conference on pulmonary hypertension. This important event provided an opportunity for leading PH researchers from the United States and abroad to discuss the state of the science in pulmonary hypertension and future research directions.

According to these leading researchers, we are on the verge of significant breakthroughs in our understanding of PH and the development of new and advanced treatments. Twelve years ago, a diagnosis of PH was essentially a death sentence, with only one approved treatment for the disease. Thanks to advancements made through the public and private sector, patients today are living longer and better lives with a choice of six FDA-approved therapies.

At a congressional hearing on pulmonary hypertension in December 2005, Dr. Mark Gladwin, who was then chief of the Vascular Medicine Branch at NIH's NHLBI said, "I study what is happening in pulmonary hypertension as an example of what you can do with an orphan disease. With the combination of advocacy, industry involvement, and state-of-the-art basic science, they came together, in a perfect storm of opportunity."

Recognizing that we have made tremendous progress, we are also mindful that we are a long way from where we want to be in 1) the management of PH as a treatable chronic disease, and 2) a cure. Our needs are in both clinical research and public and medical professional education. PH patients typically visit three physicians before a fourth makes an accurate diagnosis—often losing a year or more and making their prognosis significantly less promising.

With this in mind, the Pulmonary Hypertension Association respectfully requests that the Office of Research on Women's Health make pulmonary hypertension a research priority now and in the future.

ELIZABETH ARNDORFER

Reproductive Health Technologies Project

Public Testimony of the Reproductive Health Technologies Project to the Office of Research on Women's Health

Since its inception, the mission of Reproductive Health Technologies Project (RHTP) has been to advance the ability of every woman to achieve full reproductive freedom with access to the safest, most effective, appropriate, and acceptable technologies for ensuring her own health and controlling her fertility including preventing, terminating, or continuing a pregnancy.

Mounting scientific research indicates that chemical contaminants are impacting health, including reproductive health and fertility.

- About 10 percent of women report difficulty conceiving and maintaining a wanted pregnancy. Women under the age of 25 report the largest increase in this problem.
- An expert panel recently commissioned by the government concluded that breast development and menarche in girls is beginning at an earlier age and that early puberty is linked to breast cancer and behavioral disorders.
- Compared to 30 years ago, more than 25 percent more women get breast cancer and three times as many women are being diagnosed with thyroid cancer.
- While there are no population-wide data, estimates suggest that uterine fibroids and endometriosis are harming the health and fertility of between 10 to 50 percent of American women. Uterine fibroids are the single largest reason for hysterectomy in women of childbearing age.

- Thirty percent more babies are born premature, and on average, babies are born 1 week earlier now than they were 15 years ago. Prematurity puts a child at risk for a host of health problems, including neurodevelopmental and respiratory conditions and later-in-life diabetes and heart disease.
- Human studies show that endocrine-disrupting chemicals are impacting the ratio of male-to-female births. The most recent example of this finding is a new study of women in the San Francisco Bay area who gave birth in the 1960s. If the mother's polychlorinated biphenyl levels were relatively high, they were one-third less likely to give birth to baby boys.
- Some of the most common birth defects today are malformations of the male reproductive system. Hypospadias (deformities of the penis in infants), cryptorchidism (undescended testicles), and testicular cancer appear to be increasing, while sperm count and testosterone levels are declining in certain populations.
- While cancer mortality is declining, the incidence of most childhood cancers continues to rise. These cancers are suspected to occur from alterations while the woman is pregnant and carrying the fetus.

Research links these human health problems to chemical contaminants in the environment.

- In biomonitoring studies of more than 150 contaminants in the American people, the U.S. Centers for Disease Control and Prevention (CDC) reported that all 150 chemicals were detected in some portion of the U.S. population and that several of the chemicals, such as environmental tobacco smoke, lead, mercury, phthalates, and bisphenol A, are detected in nearly all or all of the population. Some of the contaminants were measured at levels that cause adverse effects on reproductive health in animal studies.
- Epidemiologic studies in several countries have linked maternal exposure to air pollution with low birth weight and preterm delivery.
- Animal studies show that exposures to chemical contaminants around the time of conception, during pregnancy, or during infancy can be particularly powerful because these are times of extreme vulnerability.
- A May 2009 study found that exposure to bisphenol A in the womb causes infant male monkeys to behave more like infant females, highlighting a new and potentially important consequence of exposure to low doses of BPA. The species of monkey used in this study was chosen for its similarity to humans.
- Other studies show that during this time, exposures to bisphenol A can cause permanent changes and increased risks of later reproductive health problems (infertility, miscarriage, breast cancer, prostate cancer).
- Prenatal exposure to phthalates found in personal care and vinyl products has been linked to reproductive effects in male babies, like undescended testicles and deformities of the penis.

- Cadmium, a metal found in cigarette smoke and in other types of air pollution, has been linked to gynecological disorders in women, such as endometriosis and reduced sperm motility.
- Animals exposed prenatally to perfluorinated chemicals, common in stain-proof and stick-free products, show increased allergic response, elevated cholesterol, abnormal thyroid hormone levels, liver inflammation, and weaker immune systems. Human babies born with higher levels of these chemicals in their umbilical cord blood have lower birth weight and smaller body mass.

Further research and data collection are needed in the area of environmental contaminants and human health. The Office of Research on Women's Health is in the position to provide significant leadership to these efforts. RHTP recommends the following:

- Conduct a Comprehensive Scientific Review. As stated in this testimony, increasing evidence points to links between environmental toxicants and human fertility and birth defects. However, the Federal Government is not collecting data on this subject in a systematic and authoritative manner. The Government needs to engage in a comprehensive review of existing and forthcoming research and issue a report on the links between chemical contaminants and reproductive health.
- Support Environmental Research and Clinician Training. Renew and expand support for the National Toxicology Program, National Institute of Environmental Health Studies, National Institute of Occupational Safety and Health to study biology of pregnancy, fetal development and reproductive health, the complexities of racial and social disparities, and the impact of the environment on human health. Clinician training should be funded to add environmental health issues to the provision of health care.
- Support Increased Funding for the National Children's Health Study. The Children's Health Act of 2000 authorized the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) and other agencies to follow 100,000 children from birth to age 21 to measure environmental influences on their health and development. The study seeks to address six chronic illnesses that cost Americans $642 billion each year (obesity, injury, asthma, diabetes, schizophrenia, and autism). If the study resulted in a 1 percent reduction in the cost of these diseases, it would save Americans $6.4 billion a year, paying for itself twice over in only 1 year. The National Children's Study will provide groundbreaking children's health data crucial to establishing causal links and preventing disease. Increased funding will expand the capacity of researchers and the study to provide the evidence needed to safeguard the health of America's children for generations to come.
- Expand and Modernize Our Disease Surveillance Infrastructure. The disease surveillance system, specifically the National Center for Health Statistics, the National Environmental Public Health Tracking Program, and the biomonitoring efforts of the Centers for Disease Control and Prevention must be expanded and modernized. Without a strong health-monitoring infrastructure, we cannot thoroughly track reproductive health outcomes such as disparities in low-birth weight births among racial groups, and trends in female health developments.

- Acknowledge and Reduce Socioeconomic and Racial Disparities. Recent studies have shown that people of color, immigrants, and people living in low-income neighborhoods are far more likely to be exposed to toxic chemicals in their workplaces and communities. Biomonitoring studies also show that these demographics have higher levels of these chemicals in their bodies and often have less access to institutions that protect their health and well-being. For instance, rates of breast cancer mortality, early puberty, low birth weight, and premature deliveries are all higher in African-American women. Improved access to health care and educational and economic opportunities, including job training, adequate housing, healthy food, transportation, child care, and other socioeconomic factors, can individually and collectively reduce the environmental impacts on women's health.
- Expand Contraceptive Research and Development. There is growing concern that pharmaceutical waste may be impacting the environment. Some concerns have been raised about the harmful effect of hormonal contraceptives, but the current scientific evidence is inconclusive. Nevertheless, expanding research for "greener contraceptives" as well as nonhormonal contraceptives would accomplish the twin goals of protecting the environment and ensuring that women have the best options for controlling their fertility.

The agenda laid out above is ambitious and long term. RHTP believes that the ORWH would be in a stronger position to accomplish these goals if the ORWH were established by statute, leaving it less vulnerable to understaffing, underfunding, and future elimination. RHTP would strongly support such an action.

Conclusion

We applaud the Office Research on Women's Health for conducting these hearings and for specifically looking into the connection between women's health and environmental contaminants. There is much that the ORWH can do in the coming years to enhance our understanding of the significant problems in this area and to protect women from the negative impact of chemicals.

CATHY EDDY

Scleroderma Foundation Northern California Chapter

My Scleroderma Story: A Disease That Disproportionately Affects Women

My name is Cathy Eddy and I am the president of the Scleroderma Foundation Northern California Chapter. I would like to share with you my story about how scleroderma has affected my life.

Scleroderma is a chronic connective tissue disease generally classified as one of the autoimmune rheumatic diseases. There are an estimated 300,000 people in the United States who have scleroderma, about one-third of whom have the systemic form of scleroderma. Eighty percent of those with scleroderma are women, usually diagnosed between the ages of 25 and 55. It is a chronic disease, often disabling and disfiguring, and potentially life threatening.

Common symptoms include hands or feet being overly sensitive to the cold, with pain and color changes; thickening of the skin, usually starting in the hands; shortness of breath; trouble swallowing; stiffness of the hands; joint or bone pain; and fatigue. Since scleroderma presents with symptoms similar to other autoimmune diseases, diagnosis is difficult and there may be many misdiagnosed or undiagnosed cases, as well.

The disease may take several forms. Localized scleroderma is more common in children, whereas systemic scleroderma is more common in adults. There is also much variability among patients. The effects of scleroderma can range from very mild to life threatening. The seriousness will depend on what parts of the body are affected and the extent to which they are affected. A mild case can become more serious if not properly treated. Prompt and proper diagnosis and treatment by qualified physicians may minimize the symptoms of scleroderma and lessen the chance for irreversible damage. The exact cause or causes of scleroderma are still unknown, but scientists and medical investigators in a wide variety of fields are working hard to make those determinations.

I was diagnosed with diffuse cutaneous systemic scleroderma in 1996 when I was 39 years old. I was a wife and mother of three young sons. I had a career that I loved in bedside nursing. Even though I was a registered nurse for 18 years, I really had no idea what a diagnosis of scleroderma would mean. My doctors were familiar with the disease, but had very limited experience with it.

As I began to research scleroderma, the news was not very encouraging. At best, it is a lifelong chronic, painful, disfiguring, and disabling disease. At worst, it is potentially fatal within a few years. As you can imagine, it is very frightening. I worried that my children would grow up without their mother.

As my disease progressed, I became more and more affected by scleroderma. My hands became bent and stuck in a claw-like position. Due to the circulatory changes caused by scleroderma, I began to develop open ulcers on my knuckles and fingertips. I had to leave my nursing job and apply for disability. That was devastating for me because I'm used to being self-sufficient, and I lost my health benefits. I developed severe gastroesophageal reflux disease, as scleroderma can damage the entire gastrointestinal system. I have scarring in my lungs and heart. Scleroderma can also damage the kidneys. My skin was so tight that it felt like it was two sizes too small. I could not raise my arms above my shoulders or reach down to put on my socks. I had incredible pain and fatigue.

I spent a lot of time going to the doctors—rheumatologist, dermatologist, cardiologist, and pulmonologist, in addition to my family practice physician and OB-GYN. I have participated in research studies, at one point going to the Mayo clinic in Rochester. It was all I could do to take care of myself and try to care for my family. I tried many medications. Some helped, others did not. I spent hours on the phone with insurance companies trying to get authorization for many tests. I also spent much time researching scleroderma on my own, as many of the doctors were not familiar with it or had never had a patient with it.

In my research, I found out about the Scleroderma Foundation. The Scleroderma Foundation is a nonprofit national organization founded in 1998 whose mission is to provide support, education, and research. It exists for people with scleroderma and their friends and families. I became a member and attended the conferences. It opened many doors for me. I was able to talk to the doctors on the cutting edge of scleroderma research and treatment.

I remained hopeful that a cure would be found, or at least we could identify a cause and a treatment. I am still waiting.

Today, I am doing better due to many new medications and the care of many fine medical professionals. I have had surgery on both hands to remove my middle knuckles and extend my fingers in a locked and functional position. I had to travel to the University of California–Los Angeles to find a doctor who would operate on my hands, and had many serious complications. I am taking 12 prescription medications. I developed skin cancer due to the side effects of my immunosuppressants. However, they are reversing the skin tightness and preventing my body from a further attack on my lungs. I have lost 50 percent of my lung function at this point. My out-of-pocket drug costs for last month alone were $2,500. I reached the Medicare Part D coverage gap in February. My husband is self-employed and we are barely making ends meet. I am grateful to be doing better, but the cost of these drugs is killing us.

In my chapter president position with the Scleroderma Foundation, I talk to many patients. I see the depression that comes from chronic disease and hopelessness. I see the pain and the breathing difficulty that comes when the lungs turn to scar tissue. I have lost some of my best friends to the devastating effects of scleroderma. There are still no approved therapies. There is still not enough awareness of scleroderma in the medical community.

One of the potential therapies that is being tested right now is stem cell transplant for scleroderma. It is showing promise, but much more research needs to be done. The need to prioritize research on diseases that disproportionately affect women and that have no approved therapies, like scleroderma, is imperative for those of us who suffer day in and day out.

Thank you very much for this opportunity to share my scleroderma story.

HASSAN SALLAM, M.D., PH.D., FRCOG

The Suzanne Mubarak Regional Center for Women's Health and Development
The Suzanne Mubarak Regional Center for Women's Health and Development

Introduction

The Suzanne Mubarak Regional Centre for Women's Health and Development (SMC) is a nonprofit training and research organization active in all areas of women's health and development, situated in Alexandria, Egypt. It offers its activities to women at large and to all professionals working in the area of women's health and development in Egypt and friendly neighboring countries. The SMC is governed by a board of trustees headed by H. E. Mrs. Suzanne Mubarak, First Lady of Egypt. The SMC was established in March 2007 and receives a

yearly budget from the Egyptian government to cover its running expenses. However, its activities are covered by national and international sponsoring bodies.

During its first 2 years of operation, the SMC has managed to attract funds from the World Health Organization, the United Nations Population Fund, the Ford Foundation, and the Swedish International Development Agency (SIDA) to support various training and research projects. The SMC is academically linked to the University of Alexandria and many of its staff members are academic staff members of the University, particularly the Faculty of Medicine and the High Institute of Public Health. The SMC is headed by Professor Hassan Sallam, M.D., FRCOG (England), Ph.D. (London), who is also the Professor and Chair of Obstetrics and Gynecology at the Alexandria University Faculty of Medicine.

Vision

To see women in Egypt and friendly neighboring countries enjoy the highest standards of health and development, health being a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity, and is firmly linked to women's development.

Mission

To work with women in Egypt and neighboring countries toward achieving the following:

- A healthy infancy with no gender gap in morbidity or mortality
- A healthy adolescent life free from violence or genital mutilation
- A healthy reproductive life with a safe outcome to mothers and their babies
- A healthy sexual life free from sexually transmitted disease, including HIV/AIDS
- A healthy and active postreproductive life
- Fertility by choice and not by chance
- A productive life free from poverty or gender discrimination

Tools

In order to achieve its vision, the SMC conducts the following activities:

Training (capacity building). Training courses are organized in all areas of women's health and development for doctors, nurses, midwives, health administrators, pharmacists, and medical and laboratory technicians. The trainers come from all Egyptian as well as international academic and clinical institutions. During 2008, the SMC conducted 45 training courses in which a total of 1,818 trainees from Egypt and 12 African and 2 Asian countries participated. Examples include basic and advanced courses on ultrasound (in collaboration with professor Stuart Campbell, University of London), courses on evidence-based medicine (in collaboration with professor Paul Glasziou, University of Oxford), courses on gynecologic endoscopy (in collaboration with Professor Maurice Bruhat, University of Lyon), and courses on urodynamics (in collaboration with Professor Uwe Ikinger, University of Heidelberg).

Research. Various research projects are conducted, including basic research in the laboratories, clinical research with patients, epidemiological research, and operational research.

Advocacy. The SMC organizes awareness campaigns in important topics related to women's health and women's rights. These campaigns are conducted in collaboration with various nongovernmental organizations with whom the SMC enjoys excellent working relationships. Examples include awareness campaigns for self-breast examination for the early detection of breast cancer and the new vaccine against human papillomavirus and cervical cancer. Awareness campaigns were also organized against female genital mutilation, active and passive smoking, as well as violence against women.

Conferences, workshops, seminars. These are conducted for the purpose of educating the medical staff and the public. They are also organized to disseminate the results of research among interested bodies. In addition, these events serve to highlight important issues related to women's health and development.

Organization

The SMC consists of six departments: three active departments supported by three supporting departments. The three active departments are as follows:

1. Training Department
2. Research Department
3. Department of Women's Development

The supporting departments are as follows:

1. Department of Conventions and Logistics
2. Administrative and Financial Department
3. Medical Department

In addition, the following units are directly attached to the Office of the Director:

1. The public relations unit
2. The legal advisory unit
3. The security unit
4. The information technology/data bank unit
5. The quality assurance unit (under construction)

Premises

The SMC occupies an impressive building overlooking the Mediterranean Sea in the centre of Alexandria and is owned by the Egyptian state. This 60-room building was established in 1929 to house the "Medical Quarantine of the East." In 1948, it was occupied by the East Mediterranean Regional Office of the World Health Organization (WHO–EMRO). When the latter moved

to Cairo in 2000, the building resorted to the Egyptian government. It was then decided to house the newly established SMC in the premises.

Facilities

The SMC possesses excellent training and research facilities appropriate to its activities. Besides the main meeting hall capable of hosting 60 to 80 seated persons (the Suzanne Mubarak Hall), it has 3 other meeting rooms with 30- to 50-persons capacity. All rooms have audiovisual facilities and can be connected to the videoconferencing system. In addition, the SMC possesses a digital library connected to the most important databases and journals related to its fields of interest as well as a skills laboratory with a fully computerized human mannequin.

Research facilities include all basic laboratories for blood chemistry, histopathology and microbiology, as well as a cytogenetics laboratory, a molecular biology laboratory, and tissue-culturing facilities. Imaging facilities include mammography equipment, bone-scanning equipment, as well as 2D and 4D ultrasound facilities. Laboratory and imaging equipment are provided with tele-medicine capacities. In addition, the equipment includes a urodynamic unit with biofeedback facilities, fetal monitoring, and various aesthetic dermatology equipment.

The SMC has 12 specialized clinics in various aspects of women's health, offering their services to referred patients from Alexandria hospitals and doctors or from the two screening clinics receiving self-referred patients. Besides offering help to the needy patients, these clinics provide an excellent background for training and research purposes. Patients in need of hospital admission are transferred to the Alexandria University Hospital, where the treatment is free. An up-to-date computer network connects the various departments, offices, and clinics of the SMC.

Research at SMC

Research at the SMC encompasses all areas of women's health and development. Currently, the SMC is engaged in the following areas of research:

Genetics of Pre-Eclamptic Toxemia (PET). The SMC is currently conducting a research project in collaboration with the University of Lund in Sweden (Professor Stefan Hansson, past National Institutes of Health grant recipient). For many reasons, PET is still commonly seen in pregnant women in Egypt. As some women do not enjoy full antenatal care services, cases of eclampsia are often seen. The current research aims at finding a genetic marker for the prediction and/or early detection of PET. The project is sponsored by a grant of 300,000 Swedish krona from SIDA. A patent is pending.

Endometriosis as a Cause of Pain and Infertility in Women. A meta-analysis of randomized studies was conducted in collaboration with Professor Aydin Arici (Yale University), Professor Juan Garcia Velasco (Juan Carlos University, Madrid, Spain) and Dr. Sonia Dias (University of Manchester). The work was published in the Cochrane Library.[1]

Infertility in Developing Countries. The SMC is currently involved in a project of bringing infertility services to developing countries, in collaboration with the Task Force on Infertility in developing countries of the European Society for Human Reproduction and Embryology

(ESHRE), the International Federation of Fertility Society (IFFS), and the Low Cost In Vitro Fertilization Foundation. The research involves the simplification of current technology to be suitable for developing countries. Part of the research has been published in the monograph published by *Human Reproduction* (the official journal of the European Society for Human Reproduction and Embryology). A grant is sought from the African Development Bank for this project.

Menopause in Developing Countries. As the age of women is rising in some developing countries, including Egypt (now standing at 71), the SMC is interested in studying the problems and management of menopause in these countries. A paper has already been published in *Climacteric,* the official journal of the International Menopause Society.[2] This study was SMC self-funded.

Breast Health Awareness. Knowledge and attitudes toward breast cancer and self-breast examination in women living in two deprived areas of Egypt have been studied (Ezbet Sekinah and Abou-Sliman). A total of 620 women was studied. Of these, 72 percent have heard about breast cancer, but only 10 percent had performed self-breast examination during the past 6 months. On questioning, 34 percent expressed their strong belief that self-breast examination (SBE) is beneficial, 16 percent had little belief in its value, and 18 percent thought it had an intermediate value. The rest, 32 percent, had never heard about SBE. Finally, 14 percent stated that they knew how to perform SBE, while the rest, 86 percent said that they did not know how to perform it. The paper is being submitted. This project was SMC self-funded.[2]

Operational Research on Self-Breast Examination. Based on the above findings, a research project is currently being conducted in the same deprived areas of Alexandria, Egypt. A total of 518 women has so far been studied. One year after training on SBE, the percentage of women practicing SBE rose to 71.6 percent during the past 6 months (from 3.1 percent before training), with 7.1 percent saying that they had SBE during the past month (compared to 1.7 percent before training). The project is still ongoing and is SMC self-funded.

Attitudes of Women Toward Domestic Violence. This research project sponsored by the Ford Foundation is currently ongoing. So far, a total of 250 women was interviewed. Preliminary results show the following:

- A total of 55 percent of the studied women agree that men have the right to beat their wives.
- The most common cause for wife battering is asking for money (82 percent).
- A total of 85 percent of the studied women accept violence from their husbands because they are afraid of divorce. Most of them leave and return several times to their homes, but they never asked for divorce.
- Most women (87 percent) consider the act of battering as an intimate personal issue between husband and wife and no one has the right to know their problems or get involved in them.

- Most of the studied women (72 percent) have suffered from family abuse (psychological abuse) from their brothers and fathers since they were young.
- The most common cause of psychological abuse was answering husband back or answering loudly (77 percent).
- Approximately 66 percent of the studied women were financially abused and 49 percent mentioned that they beg their husband to give them money, either for themselves or for their children.
- In 51 percent of cases, the husband takes the wife's money, as he believes that by marriage, the husband owns his wife, giving him the rights to take her money.

Laws Related to Violence Against Women (VAW). The SMC is currently conducting a research project in collaboration with the Protection Project of Johns Hopkins School of Advanced International Studies (SAIS), with the aim of revising the laws regarding VAW in an attempt to devise a model law to be presented to the Arab League of Nations. The project is jointly sponsored by the SMC and the SAIS. A workshop was conducted in March 2009, with the presence of Dr. Yakin Irturk, UN special rapporteur on VAW, and Professor Mohamed Mattar, executive director of the Protection Project.

Prevalence of HPV and its Various Serotypes. This multicenter study will start in earnest in collaboration with the departments of obstetrics and gynecology of Cairo and Ain Shams Universities. The project is sponsored by Glaxo-Smith-Kline. Currently, the prevalence of HPV virus serotypes in Egypt is not exactly known. Before implementing the new vaccine, this study is warranted. A total of 1,500 women attending the outpatient clinics of the 3 centers (500 subjects per center) will be studied.

A Study of Basic Development Needs (BDN) in a Deprived Area of Alexandria (El-Amrawy). This study sponsored by the WHO is now complete. The results show that 80.9 percent of the 8,000 targeted families were reached. The illiteracy rate in this deprived area of Alexandria is 18.1 percent and the unemployment rate is 4.6 percent. Pregnant women pay an average of 3.6 antenatal visits per pregnancy. The family planning services reach 90 percent of the population. The under-5 infant mortality rate is 25.32/1,000 live births and the maternal mortality rate is 34.29/100,000 live births. The paper is currently being submitted.

Prevalence of Glucose-6-Phosphate Dehydrogenase (G6PD) Deficiency in Egyptian Newly Born Babies. A study was conducted on 6,000 male newborn babies and 165 (2.8 percent) were found to have G6PD deficiency. This study was SMC self-funded and the paper is currently being submitted.

Prevalence of Congenital Adrenal Hyperplasia (CAH) in Egyptian Newly Born Babies. A study was conducted on 7,000 male and female newborn babies and 11 (0.16 percent or 1.6/1,000) were found to be affected by the CAH. This study was SMC self-funded and the paper is currently being submitted.

A Study of Healthy Life Styles of Egyptian Women is Currently Being Conducted and Is Sponsored by WHO. This project is currently being conducted.

The following are research projects in their final stage of planning:

- Prevalence of gestational diabetes in Egyptian women, a multicenter study in the Mediterranean Area, to be sponsored by the Mediterranean Group for the Study of Diabetes (Head: Professor Moshe Hod, Israel)
- A study on embryo selection in assisted reproduction using various metabolomics
- A study of various constituents of the amniotic fluid in very early pregnancy (<7 weeks)

Conclusion

Despite its recent debut, the SMC is striving to achieve its goals of promoting women's health and development in its part of the world, and is using basic and applied research to reach these goals.

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KATIE GILLESPIE, M.A.

University of Arizona

Research Priorities for Rural Women: Assessing Health Status, Enhancing Health Literacy

The mission of the Arizona Rural Health Office at the University of Arizona Mel and Enid Zuckerman College of Public Health is to promote the health of rural and medically underserved individuals, families, and communities through service, education, and research. The Arizona Rural Women's Health Initiative is a project of the Rural Health Office in collaboration with several agencies across the State. Since 2006, the Arizona Rural Women's Health Initiative has developed and grown to address rural women's health and healthcare needs. The Initiative has sought to use research on rural women's health, along with the experiences and perspectives of members working in rural communities, to assess, coordinate, and respond to the multiple issues that shape rural women's health in Arizona.

Two items have been identified for a rural women's health research agenda:

- Data on rural women's health status
- Rural health literacy

The victory of dedicated support and funding for research on women's health is a huge accomplishment, in part, because it was recognized years ago that women's health status and health needs are different from men's and research was needed to understand and address those needs. The same can be said for rural women. Rural populations face significant health disparities. Rural women's health status and health needs are different from those of nonrural women, and research is needed to understand and address those needs.

Background and Significance

The obstacles to maintaining personal health in rural areas are vastly different from those in urban areas. Rural Americans face a unique combination of factors that create health disparities not found in urban areas. Economic factors, geography, cultural and social differences, lower educational attainment, lack of recognition by policymakers, and the sheer isolation of living in remote rural areas all conspire to impede rural Americans in their struggle to lead a normal, healthy life.

In addition to maintaining their own health, rural women, like women everywhere, are given responsibility for the mental, emotional, and physical health of their families and communities. They knit together the fabric of family and community life, often serving as the caregivers, supporters, and volunteers in a community. As a result, women are disproportionately affected by the lack of access to a range of healthcare services close to home, not only because they tend to be the main users of healthcare services, but because they are traditionally responsible for maintaining life at home as well as providing support and transportation if a family member must travel elsewhere for care. Women are further disadvantaged because they generally prefer to see female healthcare providers, but few women physicians are available in rural settings, and other health-related services that specifically benefit women, including women's shelters, are scarce.

Importantly, the work of the Arizona Rural Women's Health Initiative arrived at a critical observation related to the empowerment of rural women to have a voice in their own health care. Specifically, the gap to be addressed was defined as the need for leadership development among women in rural communities. Too often, urban-based programs "reach out" to rural health consumers, and the health system structure within a rural community tends to reinforce a woman's feelings of disconnectedness from her health.

Rural living poses special challenges (and opportunities) for the significant health intermediary role that women enact. It is well established that people living in rural areas have shorter life expectancies and higher rates of disability, and experience more accidents, poisonings, and incidents of violence than their urban counterparts. Limited local services, long distances to travel, and a lack of transportation alternatives constrain rural dwellers' access to healthcare services.

Rural areas are not uniform and research on rural women's health needs to address the nuances of rural areas. Arizona provides a useful example. Rural Arizona is not a uniform landscape environmentally, socially, or culturally. The diversity of rural areas ranges from borderlands to Indian reservations to areas classified as frontier. Population composition varies greatly among regions, and includes large percentages of Hispanic and American Indian people. Consequently, rural women in Arizona face an array of healthcare issues, and multiple

agencies in different regions have developed specialized responses for the communities that they serve. Despite continual and concerted efforts, however, significant gaps in services for rural women persist in all areas of the State.

Agenda Items

1. Data on Rural Women's Health

Research on rural women's health requires data. Some data collection sources and systems exist, but women's health data often are generally not examined beyond a State or county level. Health data for rural versus urban women is woefully lacking. Additionally, better data and more research on rural health systems delivery and rural health/human services are needed. Data on rural versus urban women's health should be a priority of a women's health research agenda.

Recommendations for Research

Include Rural Populations, Areas, or Systems in More Studies. Entities that sponsor or conduct health services research—particularly through large national or regional studies and surveys—should more often include identifiers for rural people, areas, or systems in studies.

Incorporate Rural Sites into Program Evaluations. Since one-fifth of the Nation's population lives in rural areas, differences in the impacts and costs of programs that serve rural families could be large, both in social and in budgetary terms. Therefore, including rural sites and samples in evaluations, or conducting evaluations specifically designed for rural areas, could improve rural programs and policies.

Oversample Rural Sites and Populations. Rural populations are small. This can make statistical analysis less precise or preclude the use of sophisticated analytic approaches. Oversampling of rural areas is an important option for improving rural health services research, conducting more sophisticated analyses, and better identifying significant rural findings or rural versus urban differences. It is particularly important when there may be differences among racial/ethnic, cultural, or other demographic or community subgroups.

Report Rural Findings. Many national and regional studies do include rural data. But if rural issues are not a specific focus of the study, or if key findings do not differ between rural and urban sites, report authors generally do not include discussions of rural experiences and findings in published reports, or even provide information on the breakdown of sample members by rurality. Providing such information could help answer many important rural research questions.

Make Better Use of Existing, Detailed Rural Classification Systems. Detailed and informative classifications of rural areas have been developed for use in demographic and economic studies. To date, however, they have been little used in a number of rural health research topics such as poverty and health and human services issues. As a result, a paucity of information is available to study variation across diverse rural areas, or to capture the complexity of rural versus urban differences. To the extent possible, rural data should include geographic identifiers that can support the use of detailed rural classification typologies, and researchers should make more use of alternative rural classification approaches.

Disclose Rural Definitions and Classifications Used in Studies. Study authors should disclose the definitions used to classify rural observations. Failure to do so makes it difficult to interpret rural research findings, as well as to summarize and synthesize findings across studies.

Add Information to Make Small, Region-Specific Rural Studies More Generalizable. The rural health and human services research literature is largely composed of small, region-specific studies. Findings from such studies can be useful, in the absence of nationally representative studies. Their generalizability could be improved, however, if in addition to including operational definitions of rurality, authors provided detailed descriptions of rural samples, along with descriptive and demographic information on rural study sites.

These recommendations will have a direct impact on the current health monitoring systems. For example, the Arizona Department of Health Services Bureau of Women's and Children's Health has recognized the need to examine women's health data by rural and nonrural populations. Given the current exigencies of the economy, however, the Bureau has few resources to add this level of analysis at this time.

2. Health Literacy

Poor health literacy levels are linked to poor health outcomes, which impact the health and quality of life, as well as the healthcare system. Health literacy must be a priority for research on women's health needs. In addition, although there have been some national studies on health literacy, these studies have not analyzed health literacy in rural populations versus urban populations. A search of the literature for rural health literacy reveals only two small studies that address this need. Research should also examine the sources of health information that rural and urban women use; women's understanding and interpretation of health information; and women's use of different media to access health information.

Summary

Research agendas translate into funding opportunities and rural areas have unique funding needs. Specialized priorities for funding research on rural populations have been essential for the work that has been done so far, and rural populations need to continue to receive priority opportunities. Research agendas also set up qualifications for what counts as rural. In defining what is rural, there should be recognition of different types of rural populations, for example, migrant farm- workers. Additionally, rural communities have raised the issue of equitable access to grant funding, at a basic level of receiving timely information and using the grants.gov system for submitting grant applications. The research agenda for women's health needs to be aware of the limited capabilities of rural communities for accessing funding and provide extra technical assistance to develop greater capability. Finally, the research agenda should include the perspective of doing research "with" rural women instead of "on" rural women. A community-based participatory research model empowers women and empowers communities while building capacity and enhancing the potential research results. Research on rural women's health and strategies to improve it is a key factor for understanding and addressing the health disparities that rural women experience and for identifying unique opportunities and assets that support rural women's health.

VANESSA JACOBY, M.D., MAS

University of California, San Francisco

K12 Training Programs and Randomized Trials for Benign Gynecologic Conditions

My name is Vanessa Jacoby. I am an Assistant Professor in the Department of Obstetrics, Gynecology, and Reproductive Sciences at the University of California, San Francisco (UCSF). I am a second-year scholar in the K12 Women's Reproductive Health Research Career Development Program (WRHR). I am here to wholeheartedly thank the Office of Research on Women's Health for initiating and supporting K12 training programs such as the WRHR.

When I was in residency, there were several faculty members who made a particularly strong impression on me. They were smart, creative, insightful, dynamic leaders impacting women's health on a national scale. I wanted to emulate their careers and improve women's health through high-quality clinical research. I quickly realized the common starting point for all of these successful faculty—an NIH-supported training grant in women's health.

I was elated when I received an acceptance letter for the WRHR program. The WRHR has been essential support toward building my career as an independent clinical researcher. I have highly committed mentors who meet with me regularly, didactic training in advanced epidemiology and biostatistics, peer support and networking with other K scholars, and protected time for original research. I am so grateful to be a WRHR recipient.

My one concern is the apparent disparity in funding for K programs in women's health compared to other specialties. Every Friday, I meet with a peer group of about 30 K12 and K23 recipients from across UCSF. All of these junior faculty members receive $10–20,000 dollars more in annual research funding than the WRHR recipients. This has a significant impact on the scope of projects we can complete and sends a clear message regarding the value of women's health research compared to other fields. I urge you to continue advocating for K12 training in women's health and to work toward gaining financial parity with other K programs.

My WRHR research is focused on elective oophorectomy at the time of hysterectomy for benign conditions. Approximately 50 percent of the 600,000 hysterectomies performed every year include oophorectomy. While some observational studies have found adverse consequences for oophorectomy on cardiovascular health, bone health, and cognitive function, others have not. The practice of oophorectomy warrants the highest quality evidence to guide informed decisionmaking. To that end, we are conducting a pilot study, the first randomized controlled trial of oophorectomy vs. ovarian conservation among women undergoing benign hysterectomy. Our ultimate goal is to conduct a larger multicentered randomized trial of oophorectomy. Given the frequency of oophorectomy and the significant impact it may have on a diverse range of health outcomes, we believe that a randomized trial is paramount and hope that you will support this aim.

The lack of randomized trials for oophorectomy is indicative of a larger problem in gynecologic surgery research. Surgical devices are approved by the Food and Drug Administration (FDA) and widely disseminated without randomized trial data to support their use. This is in stark contrast

to the FDA standards for approval of a new medication. Interventions such as robotic surgery and hysteroscopic morcellators have gained widespread popularity though there are, to date, no randomized trials to determine whether these methods are truly superior to current standards of care. Without randomized trials, the introduction of new surgeries and surgical devices will continue to expand without high-quality studies to assess their safety and efficacy. I strongly urge the ORWH to support randomized trials for surgical interventions to treat common gynecologic conditions such as uterine fibroids and abnormal bleeding. Women undergoing gynecologic surgery deserve informed counseling based on the highest quality evidence.

PURNIMA MADHIVANAN, M.D., M.P.H.

University of California, San Francisco

State of Research in Women in Developing Countries

I'm Purnima Madhivanan, Infectious Disease Epidemiologist for the San Francisco Department of Public Health, Assistant Clinical Professor at the University of California, San Francisco, and Executive Director for the Public Health Research Institute in India.

I would like to first thank the National Institutes of Health, the Office of Research on Women's Health; the Department of Obstetrics, Gynecology, and Reproductive Sciences at UCSF; and the National Center of Excellence in Women's Health for sponsoring this important meeting.

While a portion of my work focuses on prevention of sexually transmitted infections among young women here in San Francisco, today I want to take this opportunity to speak on another subject that is very close to my heart: the state of reproductive health research in India and other developing countries.

Public Health Research Institute India was chartered to address the health challenges facing women and children in India. Having worked in research on HIV and women's health for more than 10 years, I remember when ORWH launched the women's health research agenda. I have to say quite bluntly that we have not moved far enough in achieving those far-reaching goals that were first articulated in 1996.

- We are still largely extrapolating research on men to women without modification. As an Human Immunodeficiency Virus physician, I have struggled daily with antiretroviral dosing options that are poorly defined and often inappropriate for low-weight females and children.
- Researchers continue to exclude women, particularly those who are pregnant, from clinical trials, even though they are often in greatest need of treatment options.
- Infectious and parasitic diseases continue to claim more lives than any other disease category in settings like India, while research dollars are more than ever focused on more profitable treatments for chronic diseases.

Most importantly in developing countries, we know almost nothing about the health issues across the lifespan of women. Current research on women has been almost entirely focused

on the issue of safe pregnancy, which while important, completely ignores the importance of developmental issues from birth to young adulthood, and the importance of mature women to families, communities, and newer generations.

Several months ago, I saw a patient in our reproductive health clinic who illustrates this conundrum. It was the first time that Ashwini, who was 21 years old, had ever seen an allopathic doctor. She was pregnant—the only time young women in India ever receive basic medical care. At just 90 pounds, a little under 5 feet tall, she was obviously suffering from chronic malnutrition. With hemoglobin below 7 grams, she was badly anemic and she was complaining of a white discharge. I did what I could, but knew that the prognosis for Ashwini and her baby was poor. Not surprisingly, she delivered an underweight girl at 33 weeks. We now have a sick 21-year-old mother caring for a sick infant who has already been in the hospital several times with serious respiratory illness.

As public health researchers, how can we ensure that bad health is not a continuing legacy—a continuing cost from one generation to the next?

Perhaps it's appropriate as we look forward to an updated research agenda on global health that we acknowledge that we have only just begun to tackle the important issues set out in the 1999 Report of the Task Force on the NIH Women's Health Research Agenda.

First, we need to rid ourselves of dangerous assumptions that threaten the health of women and children everywhere.

- Women are not like men. While there has been considerable progress toward the inclusion of women in clinical trials, the same cannot be said about their levels of participation in the developing world. In East Africa for instance, Phase I and Phase II trials had 1:8 female-to-male participation ratio. The NIH should aggressively move to ensure that trials are representative and yield relevant data for treatment guidelines.
- Pregnant women must be included in clinical trials. It's time that we acknowledged that while this may represent an elevated level of risk for researchers, pregnant women represent a disproportionate number of females seeking healthcare in developing countries.
- Research on women must be holistic and oriented to the entire lifespan. We are fooling ourselves if we don't acknowledge that a sick child goes onto become a sick adult.
- The etiology of disease differs in different populations. It's time that we acknowledge that a study conducted among antenatal attendees in the United States may not necessarily be relevant in a developing country like India. This is particularly true in the study of how infectious and parasitic disease is related to preterm birth.

I hope that this audience will not misunderstand me. We are making progress in prioritizing the health needs of women in many parts of the world. Many of you in this room have been an important part of that changing paradigm. As we look toward that brighter future, however, I hope that we renew our efforts to ensure that women in developing countries benefit from that increased focus on improving the health of all women.

PATRICIA A. MCDANIEL, PH.D., AND RUTH MALONE, PH.D., RN, FAAN

University of California, San Francisco

Tobacco Is a Critical Women's Health Issue

Tobacco Is a Critical Women's Health Issue

Although tobacco use is the leading cause of preventable death among American women, killing more women each year than AIDS, suicide, murder, car accidents, and drugs combined,[1] tobacco goes largely unrecognized as a women's health issue.[2] Women's magazines devote most of their attention to breast cancer, despite the fact that, in 1987, lung cancer, a cancer almost exclusively due to smoking, surpassed breast cancer as the leading cancer-related cause of death among women.[3-6] Women underestimate the health effects of tobacco use.[7,8] Women's groups, many of whom have received tobacco industry funding, also largely ignore tobacco.[9-11] Reducing tobacco use among women should be one of the highest priorities for women's health.

Prevalence of Smoking Among Women And Girls

Although the overall smoking rate among women has declined in the United States, it is unlikely to reach the Healthy People 2010 goal of 12 percent.[12] Currently, 17.4 percent of women smoke, but there is significant variation by race and ethnicity, with American Indian women having the highest prevalence rate (36 percent), followed by White women (19.8 percent), Black women (15.8 percent), Hispanic women (8.3 percent), and Asian women (4.0 percent).[13] Smoking prevalence rates also vary by poverty and education level. Women living below the poverty line report higher smoking rates than those living above it, and women with a high school or general educational development diploma or less report higher rates of smoking than those with an undergraduate or graduate degree.[13] Of 12th grade girls, 19.1 percent smoke;[14] although this represents a slight decline from previous years, because even occasional smoking is extremely addictive.[15] The majority of these girls are likely to remain smokers well into adulthood, regardless of their intentions to quit.[16] Similar to adult women, smoking prevalence rates among 12th grade girls are higher among Whites, followed by African Americans and Hispanics.[14]

Tobacco's Health Effects

Tobacco's toll on women includes lung cancer, a particularly deadly cancer. In the United States, 5 years after diagnosis, nearly 90 percent of women diagnosed with breast cancer are alive, whereas nearly 85 percent of women diagnosed with lung cancer have died.[17] Smoking also accounts for one of every five deaths from cardiovascular disease, the leading cause of death among women overall.[18] Smoking is the primary cause of chronic obstructive pulmonary disease (COPD) among women, and increases the risk that women will suffer from cancers of the larynx, liver, bladder, kidney, stomach, colon, and pancreas.[3] Although women and men who smoke share excess risks for many diseases, women also experience unique smoking-related disease risks related to reproduction. The use of oral contraceptives has been linked with increased risk of cardiovascular disease in women smokers.[19] Smoking is also linked to cervical and uterine cancer, reduced fertility, and early menopause.[3] Smoking during pregnancy increases the risks of spontaneous abortion, ectopic pregnancy, premature labor, and low birth weight.[3]

Smoking and Health Disparities

Although it has long been assumed that "women who smoke like men, die like men who smoke,"[20] recent research indicates that women smokers are at higher risk than men of developing lung cancer and colon cancer at the same level of smoking.[21,22] Women smokers are also more susceptible to COPD than men smokers, even when they have smoked for fewer years and with less intensity.[23] Because smoking is increasingly concentrated among the poor and those with lower educational attainment, the burdens of tobacco-caused disease will fall heavily on disadvantaged women.

Secondhand Smoke Is a Women's Health Issue

Women and children are the majority of the world's involuntary smokers. Children exposed to secondhand smoke in utero are at increased risk for adverse health outcomes, including low birth weight and preterm delivery.[24] Infants exposed to smoke are at higher risk for respiratory illness and sudden infant death syndrome.[24] During early childhood, children exposed to secondhand smoke are at increased risk of developing bronchitis and pneumonia.[25] Nonsmoking women married to smoking men are at increased risk of developing lung cancer,[25] and, among premenopausal women, secondhand smoke has been identified as a causal factor in breast cancer.[24]

Women's employment opportunities also frequently result in secondhand smoke exposure and its attendant health risks. For example, food service workers, the majority of whom are women, have the most exposure to indoor secondhand smoke of any occupation.[26] Even in States with comprehensive clean indoor air laws, workplaces that are out of compliance with the law have been found to be more likely to employ women.[27]

Smoking Cessation

Women find it more difficult to quit smoking than men.[28] Nicotine replacement therapies are more effective in men than women.[29] Women are also less confident than men of their ability to quit smoking, and, while three-quarters of women smokers report wanting to quit, only 2.5 percent succeed for at least 1 year.[30] In addition to nicotine addiction, women face barriers such as fear of weight gain, depression, and family stress, such as childcare, that make quitting difficult.[30]

Tobacco Industry Targeting of Women and Women's Groups

Marketing is key to the creation and spread of the tobacco epidemic among women. Tobacco companies first singled out women in the United States and other high-income countries as an important target market, creating advertising images centered around emancipation, glamour, and attractiveness to appeal to women and introducing cigarette brands designed specifically for them.[31-33] They have employed similar strategies, including using images of Western "emancipated" women in tobacco advertising, when encouraging women in low- and middle-income countries to take up smoking.[25,34,35] Tobacco companies have also preyed on women smokers' health concerns, marketing slimmer, "light," and "low tar" cigarettes to women to give the impression that they are safer than other cigarettes.[36] These efforts have been linked to increases in smoking initiation among women and girls.[37]

Tobacco companies have also sought to secure women as allies who could help maintain a policy environment favorable to the tobacco industry. Their strategies for doing so have included funding women's organizations, which were then less likely to support policies, such as raising cigarette excise taxes, that conflicted with tobacco company business objectives.[9-11] In recent years, as the tobacco industry has lost credibility with the general public, tobacco companies have also tried to improve their image among politically influential women.[38]

Tobacco as a Global Health Issue for Women

Globally, approximately 250 million women smoke.[39] While men's smoking rates have peaked or are declining, women's rates continue to rise.[40] The World Health Organization predicts that 25 percent of women will smoke by 2025.[40] (This does not include other forms of tobacco used by women in various regions, including chewing tobacco, water pipes, bidis, chutta, betel nut, and snus or snuff).[34] Women in developing nations are particularly vulnerable, as they represent the prime growth market for the tobacco industry, with only 9 percent estimated to be current smokers.[39,41] Even if they do not take up tobacco themselves, tobacco may represent an economic burden on their households. Spending on tobacco products translates into less money for food, education, housing, and health care.[34] Tobacco-caused disease can lead to increased family health care costs, or result in the loss of a family member and his/her earning power.[34]

Research Priorities

Key research priorities for addressing tobacco as a women's health issue should include, in addition to studies of tobacco's effects on women's bodies, studies of the gendered dynamics of tobacco prevention, use, and cessation; whether/how tobacco control policies may have differential effects on males and females; how women perceive tobacco marketing, the tobacco industry, tobacco control efforts, and tobacco use; and the intersections between women's rights and tobacco control policy issues.

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Poverty, Unstable Housing, and HIV Infection Among Women Living in the United States

Synopsis

Women who are HIV-positive incur a higher risk of mortality than men who are HIV-positive, a difference that is primarily based in the social context of poverty. Economic crises that lead to homelessness, unmet subsistence needs, and sex exchange often reorder priorities among HIV-infected women, deemphasizing consistent medical care or the use of antiretroviral therapy. High rates of mental illness, drug use, and victimization further increase health and safety risks. HIV prevention messages highlighting education and behavior change insufficiently address the predicament of indigent women where constrained survival choices in the context of poverty may take precedence over safe behaviors. This testimony highlights the current scientific evidence regarding health and safety risks of poor and unstably housed women, and concludes that a better understanding of the context in which risks occur is needed.

Introduction

HIV infection disproportionately affects populations with high rates of mental illness, illicit drug use, poverty, and homelessness. Additionally, HIV surveillance data suggest increasing rates of HIV infection among women, and women of color in particular. The overlay of these issues complicates HIV prevention and treatment provision, contributing to excess morbidity and mortality among highly vulnerable individuals, such as poor and homeless women. Although effective interventions exist to reduce the impact of these exposures on HIV risk and progression, impoverished women continue to incur high rates of HIV infection and suffer from inadequate access to health care with consequently worse treatment outcomes.

Survival differences in HIV infection by sex are embedded not in biological differences, but in economic and power imbalances between the sexes.[1] In recent years, researchers have become increasingly aware that improving our understanding of women's risk for HIV and developing effective interventions to reduce HIV risk "rests on the awareness that the epidemic is deeply rooted in a larger context, one in which HIV/AIDS co-occurs with other public health problems such as violence, and with structural inequities involving poverty and homelessness."[2] This testimony describes the intersection of competing and unmet needs of U.S. women at risk for or living with HIV. The work presented here indicates that a better understanding of the sociocultural context in which HIV is transmitted and HIV infection progresses will lead to better intervention strategies, better outreach services, and ultimately better healthcare strategies to serve vulnerable women.

HIV Infection and Mortality: Why Are Women Dying Faster?

Women account for an estimated 27 percent of the 1.1 million cases of HIV/AIDS in the United States.[3] Three-quarters of HIV infections among women were acquired through heterosexual contact,[3] and more than 80 percent occur in racial and ethnic minorities (African-American or Latina).[4] Overall, HIV infection is the fifth leading cause of death for all U.S. women ages 25 to 34, and the third leading cause of death in Black women in that age group.[5] During the 1990s, it was reported that the risk of death among women was 33 percent higher than among men.[6] Also during the 1990s, survival after receiving an AIDS diagnosis was 24 percent lower among women.[7] The reasons for these disparities are multifactorial and include a more advanced disease state at diagnosis and less frequent use of antiretroviral therapy (ART).

Use of ART is the single most important predictor of survival among patients with advanced HIV infection,[8] and sustained use of ART is the strongest predictor of survival among the homeless and marginally housed.[9] In the United States, significantly fewer women than men who qualify for ART actually receive it.[10] Even when women do receive ART, studies from both the pre- and post-combination ART eras have shown that women are twice as likely as men to discontinue therapy due to adverse effects.[11,12] Combined, these factors result in comparatively fewer women being on ART when clinically indicated. Gender differences in mortality diminish significantly after adjustment for access to care, receipt of ART, and adherence to ART.[13] The reasons behind differential access to care and ART use are multifaceted and are tightly linked to women's risk factors for becoming HIV infected.

Barriers to Health Care Among Poor and Marginally Housed Women: The Context of HIV Risk

Homelessness Among Women in the United States. In cities throughout the United States, the estimated growth in homelessness within certain neighborhoods is as high as 25 percent per year, resulting in about 1 percent of the total U.S. population experiencing homelessness each year.[14] Societal and structural factors contributing to increased numbers of homeless women include the deinstitutionalization of mental health services, the crack cocaine epidemic, low wage structures, and limited employment opportunities for women with limited job skills; a shrinking supply of affordable housing and barriers to receiving and maintaining government subsidies[15] also play a role in women's housing instability.

Homelessness can manifest itself in ways other than sleeping on the street or in a homeless shelter.[16] Women are particularly susceptible to less visible forms of homelessness, such as doubling up with friends or family because they have no place of their own, moving frequently among different friends ("couch surfing"), or exchanging sex for shelter.[17,18] Women also often reside in marginal housing environments such as low-cost single-room occupancy (SRO) hotels, where two-thirds of occupants have been homeless at some point in their lives and 27 percent have been homeless within the past 12 months.[19] Just as with literal homelessness, living in SRO hotels has been linked to high rates of drug/alcohol use, health complications, and unsafe conditions.[20,21] Because transitions in and out of homelessness occur quite frequently, it is important to consider housing status, and the risks inherent therein, as a dynamic process rather than a fixed state.[22]

Social Issues and Risk Are Different for Unstably Housed Men and Women. Female gender is one of the strongest predictors of poor health among homeless adults,[23] and there are a number of interrelated reasons for gender-associated differences in health status among those infected with HIV. In an environment of drug use, poverty, and mental illness, health care is often fragmented and numerous barriers exist to health care and social support for impoverished women.[24]

Illicit drug use is an established risk factor for the acquisition of HIV[25] and has also been strongly linked to homelessness among women.[26] Unsheltered women have significantly higher odds of using illicit drugs; having multiple sex partners; and reporting poor physical, as well as mental, health compared to their sheltered counterparts.[27] Among HIV-infected homeless persons, health-related quality of life is significantly lower among those who use illicit drugs.[28]

Drug users with HIV infection often continue to engage in high-risk behaviors. For instance, HIV-positive injection drug users inject at higher rates than HIV-negative injectors, with similar rates of sharing used syringes.[29] In addition, high-risk sexual behavior is common after the initiation of ART among HIV-infected drug users.[30] While some risk-reduction programs effectively reduce drug and sexual risk behaviors among injectors,[31] particularly among HIV-positive individuals,[32] others show that injectors continue to engage in high-risk behaviors, even after learning their HIV serostatus through post-test counseling or intervention sessions.[33]

Sex exchange for money, drugs, housing, food, and safety has been shown to expose individuals to violence[34] as well as sexually transmitted infections, including HIV and hepatitis C virus.[35] The most common routes of exposure to HIV for women of color are injection drug use and sex work related to drug use.[36] In a recent study of HIV-positive marginally housed adults, more than one-third of both women and men had a history of trading sex for money, drugs, or a place to sleep, but duration of homelessness was correlated with sex trade activity only among women.[37] Survival sex, especially among HIV-infected women, often arises out of economic crisis and increases health risks in an already risky environment. Moreover, the illegal stigmatized nature of sex work makes usual public health strategies to prevent HIV transmission more difficult to apply among unstably housed women.[38]

Mental Illness Creates Additional Challenges Among Homeless Women. Compared to men, women are at increased risk for being dually diagnosed with both mental illness and HIV.[39] As many as half of sexually active HIV-positive women with severe mental illness report having multiple sex partners and never using condoms.[40] Furthermore, HIV-seropositive women exhibit significantly higher rates of major depressive disorder and more symptoms of depression and anxiety than HIV-seronegative women with similar demographic characteristics.[41] This finding is significant since depression predicts ART nonadherence.[42]

Violence and Victimization Against Women Predicts HIV Risk Behavior and Poor Health. Victimization (sexual assault, incest, or physical abuse) is common among HIV-infected women.[43] Victimization predicts subsequent high-risk HIV behaviors and serves as a barrier to accessing health services.[44] Up to two-thirds of HIV-infected women are shown to have a history of physical or sexual abuse, which is associated with nonadherence to ART,[45] higher levels of distress and depression,[43] and higher rates of AIDS-defining conditions.[43] Among street-based sex workers, physical and sexual abuse is significantly more common among women who are homeless, rely on sex trade as their main source of income, and are HIV-positive.[46] Paradoxically, women's attempts at HIV risk-reduction behaviors, such as requesting condoms during sex, have been associated with increased intimate partner violence.[47]

Health Services Use in an Environment of Homelessness and HIV Infection. Despite the fact that the homeless incur high rates of functional disabilities, are prone to infectious diseases,[48] and experience disproportionately high mortality rates,[49] especially among women,[50] accessing appropriate health care is not always a priority among homeless women. In addition to competing needs like housing and food, transportation and scheduling can present substantial barriers to accessing health care, even for individuals at a high risk of death.[51] Services used by the homeless also tend to be emergency-based, inadequate, and less consistent than those used by sheltered persons.[52] Some homeless women reportedly feel stigmatized by healthcare providers,[53] which may in part explain their lower likelihood of reporting visiting a regular healthcare provider.[52]

Women, people of color, and the uninsured are least likely among people living with HIV to receive appropriate care and antiretroviral therapy.[54] Among HIV-positive persons, stable housing is associated with improved CD4 cell counts and functional status,[55] while female sex is associated with worse overall health among HIV-infected persons who are also marginally

housed.[28] Mistrust in the healthcare establishment among African-American women, language barriers, lack of decisionmaking capability within the family structure among Latina women, and a lack of culturally competent healthcare providers for all minority populations contribute to these disparities.[56]

When homeless patients receive care from programs targeted to their specific needs, they return for followup visits and utilize services at rates comparable to that of low-income housed patients.[57] For example, shelter-based interventions hold promise for improving treatment engagement in homeless populations with psychiatric and drug use problems.[58]

Structural Barriers to Changing Risk Behavior. Many of the public health strategies to prevent HIV during the late 1990s and early 2000s focused on education and behavior change, which did not take into account the social context in which risk was navigated or negotiated.[59] A more recent approach has been to consider environmental and structural barriers to using knowledge and exercising autonomous agency. A sociostructural approach posits that there are structural factors both intrinsic (such as gender and race/ethnicity) and extrinsic (such as institutions and policies) that strongly influence individual choice and behavior. Furthermore, structural factors such as laws, policies, economic conditions, social inequalities, and wider cultural beliefs interplay with social relationships and individual behaviors. The social structural production of HIV risk has been described as the interplay of the physical, social, economic, legal, and policy environments influencing HIV risk and prevention.[60] This approach contends that if HIV risk is socially produced, then so are public health solutions that can minimize risks.[60]

Socioeconomic factors and environmental factors have been shown to condition and constrain lifestyle choices, which may result in increased risks for disease.[61] For instance, limited economic opportunity has been associated with risky sexual practices.[62] If a woman is impoverished and depends on subsistence strategies such as trading sex, self-protection against the seemingly improbable threat of infection may be overshadowed by the more immediate need to obtain money, food, or a place to sleep.[63] In addition, a woman's financial dependence on her partner, either in a relationship or during sex work, may result in sexual safety decisions that are dictated by her partner rather than arrived at by mutual agreement.[63] A different but equally extensive line of research focusing on structural inequities has broadly supported the concept of a social gradient whereby higher social status is related to better physical health.[64] Research has also shown that living in an impoverished or deteriorated urban neighborhood is associated with poor health and risk of sexually transmitted infections such as HIV, even after controlling for individual risk factors.[65]

Conclusion: Using Context To Reduce Health Disparities Among HIV-Positive Poor And Marginally Housed Women

Unstable housing and homelessness is a growing problem among indigent women. Consequently, associated health and safety concerns, along with their influence on acquiring and/or managing HIV infection, are unlikely to subside in the near future. The dynamic and interconnected processes of homelessness, illicit drug use, sexual risk, and violence have been well established in the medical and public health literature. Continually improving HIV education

and services targeted toward HIV-infected persons is important; however, the best planned programs are ineffectual if their potential clients are unable to use them.

A recent focus on social structural barriers to risk reduction indicates that the existing public healthcare infrastructure has yet to effectively address the health needs of HIV-infected, unstably housed women. Reforming laws and policies to address these inequities and structural barriers to care is crucial.[2] In the meantime, healthcare and service providers cannot rely on impoverished women to do what is "best" for their health because poor women do not often have the agency or means to do so. Strategies to improve health and social services for impoverished women who are infected with, or at risk for becoming infected with, HIV require the consideration of the social context in which women's risks occur. Considering women's psychosocial needs as a priority, which on occasion will take precedence over physical health needs, may be the first step toward successfully engaging them in consistent use of health services.

A new research emphasis on the sociocultural context in which HIV is transmitted and HIV infection progresses will lead to better intervention strategies, better outreach services, and ultimately, better healthcare strategies to serve vulnerable women.

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Importance of the Women's Reproductive Health Research (WRHR) Program for the Physician–Scientist: A Personal Perspective

The National Institutes of Health (NIH), together with the National Cancer Institute and the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, created the WRHR Program to fund obstetricians and gynecologists interested in pursuing a research career. The WRHR program allows clinicians to start an independent career in research addressing women's health issues. One of the main advantages of the program is that scholars receive funding, and more importantly, have 75 percent of their time protected and devoted to research. I have been a scholar for 4 years and I would like to share my experience.

Thanks to the program, I have been able to thrive and start a research program. The focus of my research is to understand how in vitro fertilization and in vitro culture during the preimplantation period (the first 4–5 days of life, before the embryos attach to the uterus) affect fetal and adult development. This has particular relevance in light of the widespread use of artificial reproductive techniques (like in vitro fertilization). In fact, approximately 3 million children worldwide and up to 1 percent of children in the Western World have been conceived with these technologies.

Indeed, it is well known that a fetus that has a suboptimal growth in utero (secondary, for example, to maternal disease or to a poor nutrition), will be predisposed to diabetes, high blood pressure, and coronary heart disease during adult life. We believe that this phenomenon, termed the "developmental origin of adult health and disease," can be extrapolated back to the preimplantation development.

My laboratory is therefore performing in vitro fertilization in mice, using the mouse as a model to study the consequences of in vitro fertilization. The mice generated in vitro are followed until they reach adult age and are compared to mice conceived normally.

The results of this research are important because they have implications not only for women's health, but for the health of the whole population in general. This is an important common trend: results of women's health research benefit not only women, but the wider population.

I think it is of paramount importance that the NIH continue funding women's health research because this will allow for better doctors and, in general, for better care to be devoted to women.

This is particularly important in light of the following facts. First, Federal support to academic departments of obstetrics and gynecology through the National Institutes of Health is the lowest among other major specialties. For example, in 2006, only 1.1 percent of the total NIH budget was awarded to obstetric and gynecologic departments.

Second, there is a lack of competitive physician–scientists in the OB/GYN department who can successfully obtain NIH funding. As an example, in 2006, only 14 percent of individual applicants in a department of OB/GYN were successful in obtaining funding, the lowest percentage of any specialty surveyed.

In summary, the WRHR program has represented and still represents a fantastic opportunity for me to grow and become a better physician and I strongly advocate continuous funding in women's health research.

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Lesbian Health Research Priorities

Introduction

In 1999, the National Institute of Medicine designated lesbians as underserved by the health-care system in the United States. However, in 2000, with the change in administration to the Bush presidency, there was no effort to address the health inequities documented in this population. In fact, for the next 8 years, no research grant could be submitted with any hope of Federal funding with the words lesbian in the title or abstract. Despite that, small increments of research were accomplished toward lesbian health issues, usually by volunteer efforts. The Lesbian Health Fund was started at the Women in Medicine Conference, an annual scientific meeting of lesbian physicians. That fund supported a few pilot research projects in lesbian health. There remains much to be done. Today from Dr. Dibble's and my combined experiences as clinicians and researchers in the lesbian health field for the past three decades, we propose a lesbian health research agenda for the next 10 years that will not only bring much-needed information on specific lesbian health issues, but also critically needed intervention studies to establish effective prevention and treatment of illness among lesbians.

National Survey to Ph.D.s and M.D.s for Lesbian Health Research Priorities

In preparation for this testimony, we prepared a survey via the Internet that was sent across the United States to lesbian physicians who provide health care for a substantial portion of the lesbians in our country, as well as to lesbian health researchers. This survey was distributed to some listserves such as the Gay and Lesbian Medical Association; the Women in Medicine retreat; the Society for Adolescent Medicine's lesbian, gay, bisexual, and transgender (LGBT)

members; and the Association of Gay and Lesbian Psychiatrists. We had 345 respondents over the 10 days designated for input, and have created a subset of 200 physicians and Ph.D. researchers to articulate their priorities for lesbian health research. The mean age of this group was 48 years, reflecting a considerable length of career, with 89 percent of respondents identified as female, and 91 percent of the group identified as lesbian/gay. Ethnicity was 74 percent Caucasian, demonstrating significant input from ethnic minority respondents. Of the total sample, 45 percent had a faculty appointment, and for 22 percent of them, research was part of their job descriptions. However, many in this group did volunteer research, especially when they were involved with lesbian health issues. For the physicians, 33 percent did volunteer research that was not part of their job description, and 10 percent did volunteer research work on top of their job description that included research. For the Ph.D.s, 13 percent did volunteer research that was not part of their job description, and 53 percent did volunteer research in addition to other research that was part of their job.

Participants were asked to rank 44 topics on a Likert scale from most important (1) to least important (5). This list of 44 topics included childhood abuse (either sexual or physical), elder abuse, advanced directives, aging, alcohol abuse, anxiety, arthritis, cancer prevalence, cancer treatment, coming out, depression, diabetes, prescription drug abuse, illegal substance use (cocaine, club drugs, etc.), ethnic differences, exercise, families-of-choice, families-of-origin, fertility, fibroids, generational differences, hate crimes, heart disease, homophobia, internalized homophobia, hypertension, incontinence, menopause, obstetric issues, parenting, polycystic ovarian syndrome, pregnancy, quality of life, resilience, sexual function, sexual harassment, smoking cessation, spirituality and health, sexually transmitted infections, social support, transition issues (e.g., female to male), intimate partner violence, weight management, and youth. There was also a space where participants could register their comments.

The top 16 priorities for lesbian health research from Ph.D.s and M.D.s that were identified on the 1–5 Likert scale were depression (1.70), quality of life (1.75), internalized homophobia (1.80), hate crimes (1.82), homophobia (1.87), resilience (1.89), aging (1.91), alcohol abuse (1.91), weight management (1.93), coming out (2.01), intimate partner violence (2.03), smoking cessation (2.03), parenting (2.03), prevalence of cancer (2.03), youth (2.04), and social support (2.04).

Brief Background for Identified Lesbian Health Research Priorities

- Depression is well-documented to be increased in lesbians. It is thought that the increased incidence of depression is associated with the stress of daily homophobia. Lesbians more frequently choose psychotherapy rather than antidepressants for the treatment, compared to heterosexual women. The most effective treatment for depression in lesbians has not been established, whether cognitive behavioral approach, medication (and which are most accepted/effective specifically in lesbians), personal psychotherapy, group therapy, or complementary medicine therapies.
- Quality of life is a concept that we know very little about among lesbians. What are the components and predictors of quality of life in lesbians of different generations, ethnicities, abilities, or educational attainment? To date, there have been no studies exploring or intervening to improve the quality of life for lesbians.

- Internalized homophobia or self-loathing/sensitivity about one's sexual orientation has a strong association with depression and perhaps alcohol, food, and other substance abuse. Most lesbians are raised by heterosexual parents, and received constant messages as children about the unacceptable lifestyle of lesbians. Understanding the experience of what contributes to internalized homophobia may provide some interventions for parents, which will then contribute to healthier outcomes for all children who later identify as LGBT. That is only one issue in this very complex subject that needs the attention of researchers.
- Hate crimes are experienced by lesbians both from their families of origin (25 percent of lesbians) as well as from external sources, from levels of name-calling, physical violence, to murder. Very few resources are provided for lesbians who are victims of these crimes, and very little is done to decrease their incidence, such as education in the schools about sexual-orientation differences. The use of the word "gay," "lezzy," and "fag" are in common use on school playgrounds, and often precede a physical assault.
- Homophobia is a common experience in the United States and can affect the physical and mental health of lesbians in various ways, from accessing healthcare due to fear of judgment from homophobic office staff and medical practitioners, to being "outed" at work, which can leave lesbians open to discrimination in the workplace as well as hate crimes. How best to change homophobia into acceptance is a major issue for which we have few answers.
- Resilience is a little-studied concept, but some lesbians are able to overcome barriers, be successful career-wise, financially, and health-wise. What factors are associated with resilience, and how can resilience be encouraged for all lesbians to improve their lives and health?
- Aging among lesbians as a physical, psychological, and cultural process has not been studied in depth. Most lesbians have not borne children who may assist them in their aging years. In one city, "ondines" have been created in which lesbians come together as a small group and pledge to care for one another, with money saved for the last survivor to be able to go to an assisted-care facility. There are also anecdotal reports of increased elder abuse of LGBT clients in nursing homes. This must be studied.
- Alcohol abuse is increased in the lesbian community for women ages 20–40. Often, barriers exist to treatment, such as inpatient staff of alcohol treatment centers who have not been trained in LGBT culture. Are Alcoholics Anonymous groups even effective for most lesbians with an alcohol problem? Are there better methods to help lesbians have an improved relationship with alcohol?
- Weight management in lesbians is crucial to their health and quality of life. Lesbians have increased body mass index and thus are probably also at increased risk for diabetes and hypertension. There has been no research about the effectiveness of weight-management protocols for lesbians. There is currently one researcher who is working on a pilot study for a weight management program for lesbians; however, she has no research funding for it.

- Coming out is usually a painful process for lesbians, who risk loss of employment, friends, children, church, and family. Understanding the process better and studying the most effective and least painful methods may be of assistance to lesbians. We know that better mental health is correlated with lesbians being open with their sexual orientation but many, especially lesbians of color, remain in the closet.
- Intimate partner violence is probably at the same prevalence in lesbian couples as in heterosexual couples (11 percent), but there is very limited research in this area for lesbians and almost no shelters have a staff who have been trained in culturally appropriate care for LGBT victims of violence. Lesbians often do not turn to anyone for help in this situation because of fear of judgment from friends, police, and others when they disclose they are in an unhealthy relationship.
- Smoking prevention/cessation is of vital importance to the lesbian community, as in some studies, the rate of cigarette smoking is four times higher in lesbians than in heterosexual women. We are now seeing lung cancer and chronic obstructive pulmonary disease in older lesbians who have a smoking history. Intervention trials need to be established for lesbians to determine effective methods for smoking cessation in this population.
- Parenting for lesbians has many challenges within the context of homophobia. Although almost all of the studies show that the children of lesbian parents cannot be distinguished from those raised by heterosexual parents, there are increased and specific stresses these families undergo that need to be studied. How to determine the most appropriate school placement so that the child encounters minimal homophobia, since homophobia may contribute to behavior issues for the child, is an issue that needs study. Another issue that needs exploring is how the child successfully negotiates the inevitable name-calling of their parents. These issues and more require appropriate study in order to help families with lesbian parents.
- The prevalence of cancer is unknown among lesbians. We do not have the denominator to determine this basic epidemiological fact for this population. From our studies, we know that lesbians are at increased risk for breast cancer and it is assumed that lesbians are at increased risk for endometrial cancer and for ovarian cancer due to their low childbearing rate. It is also assumed that lesbians are at increased risk for colon cancer due to their increased body mass index and for lung cancer due to their increased prevalence of smoking. We need to study the prevalence of cancer in lesbians to target the preventable cancers such as colon cancer. Appropriate cancer education and interventions for lesbians need to be developed and tested.
- Adolescent female youth who are lesbian/queer/questioning are at increased risk for unintended pregnancy, sexually transmitted infections, suicide, and substance use. We need to study intervention/education strategies to decrease morbidity and mortality in this vulnerable group.
- Social support needs to be studied in the lesbian community to determine which types of social support are most needed to contribute to a healthier and more encouraging lesbian community. Elderly lesbians are sometimes isolated with little social support as

their friends die. Lesbian youth also may feel isolated and hopeless during the coming-out process. The link to health with social support in the lesbian community needs to be studied.

Lesbian Health Researchers

Prior to the change of administrations in 2000, a national conference was convened by the Office on Women's Health on lesbian health research, just after the publication of the proceedings by the National Institute of Medicine, which mandated further research on lesbian health issues. I, Patricia Richardson, was a member of the working group for career development. Our report reflected the risk that young researchers took when they focused their work on lesbian health. Comments such as "you are throwing your career away" were not uncommon. An additional concern was that there was no funding for lesbian health research so a young researcher would fail to rise up the academic ladder. There was also the issue of homophobia within the academic setting and the potential lack of promotion. Today, if there were significant funding for lesbian health research, we are confident that some young researchers would embrace lesbian health research as a priority, but we also think that there is a capacity in the midcareer Ph.D.s and physicians to contribute. Based on the responses from our survey, we determined that there was a significant volunteer involvement in lesbian health research. In the responses to our research questions about number of grants and their sources, we discovered that very little money has been able to be accessed for lesbian health research even when the same researcher has been successful in obtaining NIH funds for other research and has published scholarly articles.

Proposed Mechanisms for Funding Lesbian Health Research

1. Add a supplement for support for a lesbian health researcher to existing grants, similar to the current minority supplements. Not only could the sexual-orientation question be added to the project and a subset of lesbians recruited as research subjects and analyzed as such, but this individual would help to educate the team about lesbian health issues.

2. Establish a competitive small grant application cycle for a designated topic area in lesbian health each year. For instance, generate a Request For Application (RFA) on interventions for lesbians with depression and fund six different pilot intervention studies of $200,000 each at six different sites. Selection of the grants would be done by a specialized group with lesbian health research background. At the end of these 18-month grants, bring these researchers, along with others in the field, together to determine which study should move forward for a multisite trial of the intervention. Each of the six investigators would be a site Principal Investigator and additional funds would be provided for this larger intervention trial.

3. After the multisite 3-year grant was completed, bring the researchers together again to create a final report of "best practices" recommendations and/or guidelines so that the research findings can be translated quickly into clinical practice.

Conclusion

The need for lesbian health research is critical. There may be inexpensive interventions identified by this research that will decrease disease burden for lesbians and contribute to their improved quality of life. These interventions may well reduce healthcare costs for society from delay in seeking care. We have identified several areas of consensus from researchers and clinicians. We have expert researchers who are poised to do lesbian health research, and simply need the funding to accomplish this research. Thank you very much for your attention, and we hope that you will partner with us to better the health and quality of life for the millions of lesbians in the United States.

Authors

Patricia A. Robertson, M.D., is Professor in the Department of Obstetrics, Gynecology, and Reproductive Sciences, School of Medicine at the University of California–San Francisco. In 1978, she cofounded Lyon-Martin Clinic, a full-service clinic for lesbians and other women in San Francisco. She was Cofounder of the Women in Medicine retreat in 1985, an annual scientific meeting for lesbian physicians and she currently serves on its board. Since the creation of the Lesbian Health Fund in 1992, she has been on its board, serving as Grants Committee Chair for 9 years. In 1999, she was Founding Codirector for the Lesbian Health and Research Center at the University of California–San Francisco until 2007; she continues to serve on its National Advisory Board. She is currently coediting, with Dr. Dibble, the first textbook on lesbian health, *Lesbian Health 101: A Guide for Clinicians*, which is expected to be published fall 2010.

Suzanne L. Dibble, D.N.Sc., RN, is Professor at the Institute for Health & Aging, School of Nursing at the University of California–San Francisco (UCSF). She has conducted numerous research studies, written more than 100 database articles and coedited two books—*Culture & Nursing Care*, published in 1996, and *Culture & Clinical Care*, published in 2005. She cofounded the Lesbian Health & Research Center at UCSF in 1999 and codirected the Center until 2007 when she retired from the University. Recently, she was recalled to the University to work on a State-funded research grant. Her newest book, *LGBTQ Cultures: What Health Professionals Need To Know About Sexual and Gender Diversity*, written by Eliason, Dibble, DeJoseph, & Chinn, was published by Lippincott in 2009.

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Improving the Quality of Maternity Care

Greetings. My name is Tracey Woodruff and I am an associate professor in the Department of Obstetrics, Gynecology, and Reproductive Sciences and Pediatrics and the director of the Program on Reproductive Health and the Environment at the University of California–San Francisco. The Program on Reproductive Health and the Environment (PRHE) is dedicated to creating a healthier environment for human reproduction and development by advancing scientific inquiry, clinical care, and health policies that prevent exposures to harmful chemicals in our environment. We focus on the intersection of science, medicine, policy, and community

engagement in each of our areas of activity: targeted research, expanding clinical practice, and advancing science-based policy solutions. I am here to submit comments on a research agenda for women's health that will significantly improve the lives of women and ultimately families by preventing exposure to harmful chemicals in our environment.

At the beginning of the 21st century, we are in a unique but precarious position. Economic globalization, accelerating technological change, expanding industrialization, and shifting political and religious forces have provided great opportunities and challenges. Equally important, our reproductive health, and ultimately, our reproductive capacity are under strain, as demonstrated by the growing compilation of scientific findings and books on this subject, and as reflected by indicators of declining reproductive function and increasing rates of reproductive illnesses since the mid-20th century.[1-4]

Over roughly the same period, human exposure to both natural and synthetic chemicals has dramatically increased. Approximately 87,000 chemical substances were registered for use in U.S. commerce as of 2006, with about 3,000 chemicals manufactured or imported in excess of 1 million pounds each.[5] These chemicals pollute our air, water, and food supply; we are also exposed through the use of a wide range of consumer and personal care products. Data from the National Health and Nutrition Examination Survey show that everyone in the United States has measurable levels of multiple environmental contaminants in her body.[6]

The power of environmental chemicals to impact reproductive health, an integral part of womens' health, has been dramatically demonstrated through tragic episodes of extreme exposures to chemicals, such as food contamination, resulting in severe neurological, reproductive, and developmental effects caused by mercury and polychlorinated biphenyl (PCB) poisonings in Japan and Taiwan.[7-9]

More recently, attention has been placed on evaluating the effects of everyday exposures to environmental contaminants, particularly in light of the declining trends in reproductive health. For example, there has been a 40 percent increase, to about 11 percent, in the percent of U.S. women who report difficulty in conceiving and maintaining pregnancy.[10] In addition, between 1982 and 2002, the percent of young women under the age of 25, a peak time of fertility, reporting difficulty in conceiving and maintaining pregnancy doubled from 4.3 percent to 8.3 percent.[10,11] There has been a decline in the age of onset of puberty, as marked by breast development and onset of menarche, for girls in the United States between the 1940s and the mid-1990s.[12] And women's health is critical to the health of their families. We have seen increasing manifestations of adverse health among infants and children, many conditions that originate in the womb. Thirty percent more babies are born prematurely, and the expected gestational age of babies delivered without medical intervention is 1 week earlier now than 15 years ago.[13] There are increases in certain birth defects and other adverse birth outcomes, such as gastroschisis (three-fold over the past 20 years in California) and hypothyroidism (138 percent over the past 20 years in New York).[14,15] And several childhood illnesses, including certain childhood cancers and neurodevelopment disorders, such as autism, have been reported to be increasing,[16] as well.[17]

This growing science shows that reproductive health is particularly susceptible to disruption by environmental contaminants during key periods of development, during which extensive physiological events, such as cellular proliferation and differentiation and rapid shifts in metabolic and hormonal capabilities, occur. Exposures during any of these periods may result in permanent and irreversible adverse effects that can manifest immediately or later in life (labeled the fetal origin of adult disease[18]) and even in subsequent generations.

Environmental reproductive health research has also recently expanded its focus on genotoxic or mutagenic chemicals to include effects on gene expression, or epigenetics. Increasing attention has also been placed on a class of chemicals called endocrine-disrupting chemicals, which interfere with the production, release, transport, metabolism, binding, action, or elimination of natural hormones in the body. This research has also strengthened our recognition that exposure to low doses of chemicals can adversely impact reproductive health, that exposure to mixtures of chemicals can have a cumulative effect, and that these types of exposures must therefore be studied and considered in chemicals policy.[19,20] Lastly, the detection of more than 200 chemicals in the U.S. population has raised the question of how, exactly, we are being exposed.

Like many other aspects of the 21st century, the current state of women's health and environmental reproductive health research presents great opportunities and challenges. If elements of the environment we create are contributing to the decline in our reproductive health and capacity, then we have, in our hands, the ability to reverse this trend. But to identify these elements, we must overcome the challenges of studying effects on women's reproductive health over lifetimes and multiple generations; of identifying and understanding both the interrelationships between the reproductive, immune, and nervous systems in guiding development and determining reproductive success and how this can be perturbed by chemical exposures; of identifying major routes through which humans are exposed to chemicals that are pervasive in our environment; and of understanding how scientific information is most effectively translated and used for individual, community, and society-wide efforts to prevent harmful exposures. It is toward these goals that we recommend the following research program for women's environmental health, which integrates and builds upon a number of recent research agendas in related disciplines.[2,3,21,22]

Identifying Environmental Contaminant Risk

- Rapid-screening techniques for identifying potential harmful chemicals. Rapid-screening techniques are needed to identify the potential health effects of the thousands of chemicals for which only sparse toxicological data exist, and to identify emerging chemicals of concern. One particularly promising screening method involves the use of stem cells for predictive toxicology. In vitro toxicology assays based on human stem cells and their derivatives would offer significant advantages over current animal models and assays based on primary and/or transformed cell lines, largely due to their improved relevance and greater versatility.[22]
- Reproductive diseases and function surveillance. Data from cancer registries show that rates of hormonally related cancers (e.g., breast) have increased dramatically

over the past 50 years, yet we have only sparse data on potentially related women's nonmalignant conditions, such as fibroids, endometriosis, and infertility. Information on trends in all types of reproductive disease and disorders is essential to detecting problems, to developing and testing research hypotheses, and to identifying successful prevention activities.

- Biomarkers of exposure and preclinical indicators of disease. Biomarkers of exposure and preclinical disease will help to overcome the time and resource challenges of studying the entire lifespan because they would lessen the need to track exposure and disease outcomes over extended periods of time and would provide early indicators of overt disease. Support for expanding our understanding of disease mechanisms, including epigenetics, proteomics, and metabolomics, will be essential to this process.
- Effects from low-dose exposure to mixtures of chemicals. Research on the effects from human-relevant doses of exposure and from exposure to mixtures of chemicals must be expanded if we are to understand the true risks of our low level and simultaneous exposure to hundreds of chemicals.
- Lifespan and transgenerational research. Experiences such as the aforementioned mercury and PCB poisonings, combined with the growing evidence of the fetal origins of adult disease, emphasize the importance of considering and studying the entire lifespan, as well as multiple generations. In particular, continuing research on existing human cohorts such as the diethylstilbestrol (DES) Combined Cohort Followup Study (www.desfollowupstudy.org) and initiating new cohorts, such as the National Children's Study (www.nationalchildrensstudy.gov), are valuable and unique investments that must be continued and expanded upon.

Assessing Exposure

- Rapid, low-cost, easy-to-use, real-time methods for measuring environmental contaminants in environmental media and human biological samples. Development of these tools will provide the data necessary for epidemiologic and exposure assessment studies to identify leading sources of exposure contributing to our chemical body burden.
- Expanded chemical biomonitoring programs. In addition to expanding the number of chemicals measured, support is necessary for ongoing biomonitoring of subpopulations known to be particularly vulnerable to effects from chemical exposures, including pregnant women, infants, children, and elderly populations.

Enhancing Research Productivity

- Minor investments to amplify research gains. Minor investments in tools to support materials-sharing between investigators—for example, support for biological specimen banks, tissue-sharing efforts, and expansion of national surveys to include measures of reproductive health—will vastly expand the amount we can learn from existing research studies at a comparatively minimal cost.

- Technologies to support multidisciplinary and multistakeholder consortiums. Real-time, interactive, flexible, low-cost and more environmentally neutral technologies, such as wikis, blogs, and Web conferencing, offer unprecedented opportunities to form collaborations and share information with geographically disparate members of multidisciplinary teams. For example, investing in virtual consortiums that leverage existing research programs across multiple locations to remove geographic barriers and enhance research collaborations through virtual collaborations is one such idea.

Making the Findings Matter

- Research on effective public and economic policies. Support for research that identifies and evaluates interventions that influence market changes, public policies that contribute to effective chemical management, and barriers to effective chemical policy development will support more informed and effective policy and decisionmaking.
- Research on translating environmental reproductive health. Identifying the most effective means of educating and translating environmental health information from the scientific and research arenas to policymakers, clinicians, and the general public will enable scientific discoveries to make broader contributions to our health.

Communication and Collaboration

We are fortunate that the ability to lessen the detrimental impact that environmental contaminants have on our reproductive health lies within our hands. Stakeholders who must work together in this process—researchers, healthcare providers, policymakers, community and advocacy groups, and national and international agencies—have traditionally been separated by institutional and cultural divides. Each of these fields speaks a different, highly specialized language and communicates in a way that assumes a background expertise. Communication and collaboration are therefore as essential as the pursuit of knowledge and understanding through research. Overcoming the lack of common frameworks, language, expertise, and cultural barriers requires substantial effort, commitment, time, and resources. But this challenge must be pursued if we are to achieve an informed and adequately protective society in which women's health and ultimately future generations thrive.

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AMY LEVINE, ED.D.

University of California, San Francisco Center for Gender Equity

University of California Diversity Pipeline Initiative Leadership Conference

Data show that women of color are not well represented in ladder-track positions at University of California (UC) health professional schools. The University of California Diversity Pipeline Initiative conference was designed to encourage underrepresented women-of-color students in the health sciences to consider careers in academia. In other words, the goal of the initiative is to "grow our own." Held three times since 2007, the conference is sponsored by the University of California, San Francisco (UCSF) Center for Gender Equity, the UCSF Student Activity Center, and the UC Office of the President (UCOP).

As the most populous and most ethnically and culturally diverse State in the Nation, California faces unique challenges in its efforts to improve access to care and health outcomes for its citizens. In California and nationally, race- and ethnicity-based disparities in health status are compounded by reduced access to health services, lack of adequate health insurance, and the maldistribution of physicians and other health professionals. More than 165 areas in the State are designated by governmental agencies as medically underserved or as health-professional shortage areas; these shortage areas are disproportionately home to poor and minority Californians. Latinos and African Americans are greatly underrepresented in California's physician workforce; for example, although Latinos constitute one-third of the population, they account for only 5 percent of the physician workforce. Other ethnicities are similarly underrepresented, and according to the March 2008 report, *Physician Diversity in California: New Findings from the California Medical Board Survey* and many other studies, should be more actively recruited.

Evidence also shows that California's health providers are not adequately prepared to meet the needs of the State's diverse medically underserved communities, and that these health disparities will persist and likely intensify in the years ahead. Recognizing the importance of mitigating these disparities, the University of California's health sciences schools are increasing their efforts to improve the cultural competency of all graduates with respect to the needs of medically underserved groups and communities. These efforts include increased teaching about cultural and socioeconomic factors that influence health status; enhanced training on the importance of cultural and linguistic competence; and increased involvement in educational and research initiatives aimed at reducing health disparities and improving health outcomes.

As the University expands its efforts to increase diversity, improve the cultural competence of providers, and increase enrollment of students with an interest in working in underserved communities, the presence of a diverse faculty emerges as a critical factor in training future clinicians to address California's needs. A diverse faculty in the health sciences establishes a context in which both students and fellow faculty have the opportunity to interact with professors and colleagues from different backgrounds and with varied perspectives on health care. In addition to serving as role models and mentors, underrepresented minority (URM) faculty may influence curriculum design, provide students and faculty with a perspective on the needs of a culturally diverse patient population, promote better understanding of the cultural beliefs of others, and establish relationships with communities that are often not connected to universities. A diverse faculty may also introduce new kinds of scholarship to the institution and increase and strengthen bench research, translational research, clinical studies, and interventions that address health disparities.

Based on data from the University of California Faculty Diversity in the Health Sciences Report (2006–2007) presented during one of the conference workshops, the following findings emerged:

- Tenure-track hiring of URMs in UC's schools of medicine between 1996–1997 and 2005–2006 is nearly nonexistent, at less than 5 percent over the entire time span.
- Women represent more than 93 percent of tenure-track faculty in the schools of nursing, but in the schools of pharmacy, their representation falls to 39.4 percent, while in the schools of medicine, only 20 percent of tenure-track faculty were women in 2006.
- Although 49 percent of UC medical residents are women, only 24 percent of the faculty are women.
- Only 9 percent of UC medical residents are URMs of either gender, and only 5 percent of faculty are URMs.

Over the next 10 years, large numbers of current ladder-track faculty will reach retirement age, leaving the university with a crisis of leadership. However, this situation offers the university a golden opportunity to bring minority representation among faculty more closely in line with the student population.

In light of these facts, the UCSF Center for Gender Equity, the UCSF Student Activity Center, and the UC Office of the President (UCOP) developed a conference/initiative geared toward the most underrepresented group among the university's health sciences faculty—women of color—to provide them with information about academic careers in the health sciences. Students from each of the 15 health sciences schools were nominated by their respective deans based on academic merit and their potential interest in such a career; their expenses were paid by the conference and by their deans. One hundred and seventy students have attended the conference since its inception in 2007. The conference design provided mentoring and role models from among faculty women-of-color in the health sciences, as well as a series of skill-building workshops to help students build professional skills that would be important regardless of their career choice. Panel discussions featured faculty women of color from various UC schools, who discussed real and perceived barriers to achieving academic careers

in the health sciences and freely shared their own career journeys. From the opening dinner through the closing luncheon, the energy and enthusiasm of both students and faculty created a highly charged atmosphere in which students could focus on issues vital to their lives and careers. Designated "self-care" times were set aside throughout the conference to reinforce the concept of balancing work and personal time.

The conference has been attended by a highly diverse group of students including African Americans, Asian Americans or Asian/Pacific Islanders, Latinas, Caucasians, and Native Americans. A number of the students also indicated that they were of more than one ethnicity. All 15 of UC's health sciences schools have been represented. At the conclusion of the conference in 2009, students were asked to rate their interest in an academic career on a 1–5 scale, 5 being highest; the average rating of their interest before the conference was 2.7; that number had risen to an average of 4.0 after the conference. The overall rating for the conference was 4.7 out of 5 with 94 percent stating that the conference provided greater clarity about the academic career path.

On behalf of the planning committee of the UC Diversity Pipeline Initiative, we would like to suggest that a focus be placed on increasing representation of women of color in ladder-track positions at UC health professional schools. Encouraging underrepresented, women-of-color students to pursue academic careers in health and educating them about the benefits and rewards of such careers is one strategy to accomplish this goal. Financial support for the UC Diversity Pipeline Initiative conference would allow us to continue this crucial work.

MARGARET KRISTOF, M.A.

UCSF–Kaiser BIRCWH Program

UCSF–Kaiser Building Interdisciplinary Research Careers in Women's Health (BIRCWH): Testimony from Three Scholars: Valerie Flaherman, M.D.; Yoshimi Fukuoka, Ph.D., RN; Wendy Katzman, D.P.T.Sc., PT, OCS

Testimony of Valerie Flaherman, M.D., M.P.H.

The BIRCWH program has had a major impact on improving research in women's health by encouraging interdisciplinary collaboration in women's health issues. I am a pediatrician with a research focus on breastfeeding. In my field, research often focuses on infant benefits of breastfeeding, but the BIRCWH program has allowed me to focus on the maternal benefits as well, including significant reduction in maternal risk of breast cancer and ovarian cancer from improved breastfeeding duration.

BIRCWH has allowed me to collaborate with other experts in women's health and to access sources of internal funding available for women's health. In addition, being a BIRCWH scholar has given me access to extensive advice and guidance from Dr. Deborah Grady, BIRCWH co-director. Dr. Grady has been inspirational in encouraging me to seek multiple sources of grant funding, and I have had great success at fundraising this year due to her encouragement. In addition, Dr. Grady has identified several collaborative opportunities for me outside of pediatrics. I would not have made these contacts without her guidance.

In my first 11 months in the BIRCWH program, I have been able to complete a randomized trial comparing breast pumping to manual milk expression for mothers of healthy term infants who are not latching well at 12–36 hours of age. I have begun preliminary analysis of the data and I hope to be able to contribute to the literature by reporting on the efficacy of these interventions for this group. In addition, I have completed 7 of 10 scheduled focus groups to examine maternal attitudes toward provider recommendations regarding breastfeeding for mothers who have concerns about low milk supply. We hope to be able to inform clinical recommendations based on this research in future papers.

My relationship with my BIRCWH mentors and advisors has allowed me to move forward much more rapidly on the path to independent clinical research. With the help of the BIRCWH program, I hope I can contribute to women's health by improving breastfeeding duration for mothers who have started breastfeeding, and thereby reduce both infant illness and maternal cancer risk. Thank you very much.

Testimony of Yoshimi Fukuoka, Ph.D.

The BIRCWH program has given me tremendous opportunities to be an independent researcher in women's health. I would like to highlight a few of these opportunities during the program. I am an assistant professor in the School of Nursing, University of California. My research focuses on primary and secondary prevention of heart disease in women. Heart disease continues to be the leading cause of death among women in the United States, despite efforts in reducing its risk factors.

During the BIRCWH program, I was able to develop and test an innovative cell phone based physical activity program for sedentary women. The study results were positive. More importantly, no participants dropped out from our study. I have submitted three grant applications to conduct a large-scale clinical trial to further test this cell phone based physical activity program in sedentary women. If this cell phone physical active program is effective, it could potentially be administered to a large number of women. Clearly, the BIRCWH program provided me with an opportunity to transform my ideas to a research study in a timely manner.

Another important opportunity during my BIRCWH program is that I was able to establish an interdisciplinary research collaboration involving an exercise physiologist, computer scientists, nurses, physicians, psychologists, and industry. These collaborations will allow me to further develop a creative and innovative prevention program for heart disease in women in the future. I hope my research contributes to the advancement of women's health research, and ultimately to the improvement of women's health.

Testimony of Wendy B. Katzman, D.P.T.Sc., PT, OCS

I agree with my colleague, Valerie, that the BIRCWH program has had a major impact on improving research in women's health by encouraging interdisciplinary collaboration in women's health. I am a physical therapist with a research focus on postural changes in women with aging. Most people believe that hyperkyphosis, also known as stooped posture, is an inevitable consequence of aging. My research focuses on the things we can do to prevent hyperkyphosis and understanding how this impacts our physical function and mobility.

Prior to BIRCWH, I did not have access to mentors to help me develop my research career. There is a paucity of experienced researchers in my field, both locally and nationally. My interdisciplinary mentoring team has been invaluable in helping me conceptualize the scope and definition of my research. They are role models to me, exemplifying how to build a career in clinical research and develop relationships with experts in the field of hyperkyphosis. They introduced me to Dr. Deborah Kado at University of California–Los Angeles, a renowned expert on hyperkyphosis, and that relationship has already resulted in collaboration on a kyphosis project.

BIRCWH has allowed me to enroll in a 1-year program for advanced training in clinical research to develop my skills as a clinical researcher. I have been studying epidemiology, biostatistics, and clinical research design and implementation.

As a BIRCWH fellow, I have access to several databases that allow me to answer important questions related to hyperkyphosis. During this first project year, I have completed an initial analysis of hyperkyphosis as a predictor of impaired mobility among more than 3,000 older community-dwelling women. This is the first longitudinal study that has found hyperkyphosis predicts impairment over time. I received funding to complete an analysis of hyperkyphosis among healthy community-dwelling adults in the "Healthy Aging and Body Composition" longitudinal cohort study. Besides completing this project, my plans for the next year include obtaining additional funding to conduct a randomized controlled trial of exercise to reduce hyperkyphosis and determine its impact on physical function and mobility.

I am honored to have the opportunity that BIRCWH has provided me. As the first physical therapist at the University of California–San Francisco to get this award, and one of a small number of physical therapists doing clinical research in the country, I plan to bring a new perspective that contributes to the health and well-being of women as we age.

ALEXANDRA SCRANTON, M.S.

Women's Voices for the Earth

More Research Needed on Women's Health and the Environment

We appreciate the opportunity to provide input on the formation of a research agenda for the Office of Research on Women's Health. We are pleased to see that women's health and the environment is a current focus area for ORWH. We believe there is important research in this area that needs to be done to help protect women's health from the significant burden of environmental chemical exposure.

Women's Voices for the Earth (WVE) is a national organization that engages women to advocate for the right to live in a healthy environment. WVE seeks to reduce and ultimately eliminate environmental pollutants that are linked to health problems for women, their families, and their communities. WVE's goal is to educate the public about the harmful effects of chemicals, particularly those that affect women, and provide them with the tools they need to protect themselves and effectively advocate for a healthy environment. To this end, WVE creates opportunities for women to influence environmental decisionmaking.

In our work, there are too many unanswered questions about the true impacts of chemical exposure and the proportion of disease that can be attributed to it. We do know, however, that much of the chemical exposure risk women experience is both unnecessary and avoidable. Public education for individuals on how to personally avoid chemical exposure is important, but it is only part of the solution. We have a societal responsibility to create and implement policy and structural changes that make our world inherently safer to live in. Appropriate research in the area of women's health and the environment is crucial to help drive these changes, aiding in the prioritization of needed actions and providing the rationale for implementation.

Research we would like to see would include the following:

1. More comprehensive biomonitoring to determine which chemicals are found at significantly higher levels in women. In 2003, the Centers for Disease Control and Prevention (CDC) tested thousands of Americans for the presence of 116 toxic chemicals. Ten of those chemicals were found to be present at significantly higher levels in women than in men. Only one of the 116 chemicals was found present at significantly higher levels in men.[1]

2. Exposure analyses to help determine where and how women are being disproportionately exposed. The 2003 CDC testing also found that women had significantly higher levels of phthalates in their bodies than men. It has been theorized that the prevalent use of phthalates in cosmetics and beauty products has led to a disproportionate exposure in women, who tend to use these products at greater rates than men. In our work, we have also been concerned with the impact of chemicals found in household cleaning products. Women are still doing more than 70 percent of the housework in the average home.[2] Women also represent a larger proportion of cleaning workers (particularly maids and housekeepers) than men. Research is needed to better understand the disproportionate impact on women from chemicals found in these household products women are exposed to every day.

3. Improved tracking to provide a better understanding of racial disparities in women's health, and the factors (particularly environmental factors) driving these disparities. For several health outcomes, it has been shown that women of color bear a disproportionate burden of disease. There are numerous other health conditions, particularly in the area of reproductive health, where these disparities appear to be present, but the national tracking is not in place to confirm or provide additional information. Better understanding of these underreported or unreported conditions, particularly as they affect women of color, could drive changes to help better protect women's health across the board.

These are just some of the many avenues of research we would like to see pursued. We look forward to following the progress of this conference and the research agenda that is created. Again, we greatly appreciate the opportunity to provide input on this important undertaking.

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LOREEN WILLENBERG

Zephyr L.T.N.P. Foundation, Inc.

Testimony of Loreen Willenberg, Sacramento, California

I welcome the opportunity to provide input to the National Institutes of Health (NIH) Public Hearing on the Women's Health Research Agenda. As a woman who has lived with human immunodeficiency virus (HIV) infection for 17 years, I have a vested interest in this discussion. As a human subject in several clinical research studies, including one conducted by the NIH, I can share a unique perspective on the topic. Due to my work as a community-based and publicly vocal advocate for HIV treatment and vaccine research, I am a definite stakeholder in the conversation.

Women have consistently been underrepresented in clinical research trials and studies since the beginning of the HIV/AIDS epidemic. When I tested positive for HIV in 1992, I was surprised to learn that little was known about the effects of the disease on women due to a lack of clinical research. My physician, a Stanford University-educated internist practicing in Sacramento, CA, confirmed this fact. As my knowledge base increased about HIV/AIDS during those first few years, thanks to books, my physician, and information shared by the Project Inform Hotline volunteers in San Francisco, I became increasingly frustrated by the lack of information specifically oriented to women and HIV.

It is important to note that I resided in a small Sierra Nevada foothills town at the time of my diagnosis. Support services were nonexistent for HIV-women, and I did not have the benefit of accessing information from any clinic providing services to the HIV/AIDS community nor the ability to connect with other women through women's support groups. I felt very isolated and alone for many years, and, because I was a self-employed professional with concerns about the potential loss of business should my HIV status become known, I kept my HIV status to myself and sought medical care 35 miles away where my anonymity was assured.

During this time, I was deeply affected by a book entitled, *The Invisible Epidemic: The Story of Women and AIDS,* written by Gena Corea. A review by Barbara M. Bibel of Reed Business Information, Inc., (publisher), describes the book best: "In this important book, Corea offers a chronology of the impact of the epidemic on the female population. In doing so, she brings to light an even greater problem—the fact that women have been systematically ignored and neglected by the medical establishment in both research and the provision of health services." I learned that the medical community—predominantly composed of men—was generally

squeamish about "women's biology" and that the fields of gynecology and obstetrics remained outside of the generally accepted view of "medicine." I was dismayed as I read the story about a courageous group of women clinicians who attempted to alert their colleagues to the increasing and extraordinary gynecological symptoms presented by female patients during the early days of the epidemic, their concerns dismissed as evidence of "hysteria."

While it is encouraging that more women are now involved in the medical field and research arena, and programs and services for HIV-positive women have been expanded throughout the Nation, what is not encouraging is the rise of infections in women. Today, women account for 27 percent of all HIV infections in the United States, a fourfold increase since 1988, yet they account for only 17 percent of HIV/AIDS clinical research study subjects. "Over half of all adults living with HIV/AIDS in the world are women, a fact of HIV epidemiology inadequately represented in disease and treatment research. The inclusion of women in clinical trials remains consistently insufficient for meaningful evaluation of gender-based implications of drug therapy, immune function, and disease pathogenesis." (From the AIDS Treatment Activist Coalition [ATAC] position paper on women.) The chronic underenrollment of women in research contributes to a continued lack of accurate information in these areas: gender-based differences in biology; the effect of infection and its treatments on hormones in women (especially menopausal women); treatment dosage, efficacy, tolerability, and toxicity; anemia; cardio-vascular events or kidney-associated side effects; coinfections; yeast infections; human papillomavirus; cervical cancer; and the many issues facing women who are aging while living with HIV.

My journey as a subject in clinical research studies began in 2004, when I noticed an advertisement in *POZ,* a popular HIV/AIDS magazine, placed by a team of researchers in Boston called Partners AIDS Research Group (affiliated with Harvard Medical School and the Massachusetts General Hospital). The team, led by Dr. Bruce Walker, was seeking HIV-positive individuals called "long-term nonprogressors" (LTNPs) for recruitment into their study. My physician was convinced that I was a member of this unique group of HIV-infected individuals who spontaneously controlled HIV, without aid of medications and without symptoms, for long periods of time. We immediately contacted the study, and shipped blood samples to Boston via overnight express. It would be a full 4 months before we received a confirmation, and by spring the following year, my status as an LTNP was confirmed.

The most surprising thing I heard, however, was that the team lacked the resources to purchase a round-trip plane ticket for me to travel to Boston and provide a fresh blood sample to the study, despite the difficulty in locating candidates. The study team representative suggested that I attempt to find my own sponsor for the ticket and lodging costs. This was my first introduction to the lack of funds available for research, an arena I was completely unfamiliar with. Out of naiveté, I actually began making calls to AIDS Service Organizations in Sacramento, and eventually connected with a research coordinator at the University of California–Davis, at the Department of Infectious Diseases.

After listening to me explain the reason for my call, the kind woman on the other end of the phone said that while the university did not sponsor individuals in this manner, might I be interested in joining one of their studies, which focused on people like me? Within 2 months,

I enrolled in two clinical studies: Mucosal immune response, Richard Pollard, M.D., Primary Investigator, and cell-mediated immune responses to HIV-1 in gut-associated lymphoid tissue, Barbara L. Shacklett, Ph.D., Investigator. I signed my very first consent form to participate in a research study on April 7, 2005, and entered the world of scientific research with awe. I was pleased to contribute samples of blood, cells, and tissues to advance the researchers' knowledge, understanding that without study, the virus would continue to ravage people's lives. I was fascinated with the focal points of each study, and the staff was incredibly generous with their time and knowledge as they taught me specifics about the science. I began to feel less isolated because I was helping to peel back the onion, so to speak, and shed light on this insipid virus through my contributions to the studies.

Eventually, the trip to Boston did happen. Dr. Walker had received funding through a private donation that enabled the study to cover the cost of the plane ticket and two nights at a hotel. My first meeting with Dr. Walker took place in December 2005, following a tour through the research laboratory in Charlestown, MA. It would be my very first look at the equipment, and the people who were working hard to discover the mechanisms of control exhibited by LTNPs. The trip was a cathartic experience for me, because it propelled me forward into the field of treatment and research advocacy on a fulltime basis and inspired me to fully disclose my status as an HIV-positive woman to speak out for those women who could not speak for themselves.

I cannot explain why I was so compelled to dive into the biomedical field when I didn't have any background or training in it. I was tired of having questions that my physicians could not answer, and due to a highly inquisitive mind, wanted to know more about the virus that was residing inside my body. As the years have passed, I have literally spoken to hundreds of women who do not understand what is happening to their bodies because of the infection, and they remain intimidated by the medical profession. They rely on their doctors (if they have them) for current information on their symptoms or about the medications that can extend their lives, but they hesitate because they feel overwhelmed by the sheer volume of information surrounding these issues and have concerns about appearing ignorant. Many women are very concerned about being judged by their physicians should they try to speak frankly about their sexual practices, and most are frustrated by the lack of products available to them that could provide an alternative to the use of condoms to prevent the transmission of HIV. And, while several women have expressed the desire to enroll into clinical research studies to contribute in some way, the process of participation can be confusing with all of the scientific jargon used in consent forms, or by the lack of accessibility of the site itself. Additional barriers to participation in clinical research studies exist: lack of childcare, loss of wages, out-of-pocket expenses related to travel, and restrictive reimbursement policies.

I would like to draw this panel's attention to an initiative launched in 2003 by the Atlanta-based organization, The Well Project, to address these problems. Called The Women's Research Initiative (WRI), this collaborative body is made up of nearly 60 experts across disciplines and sectors representing research institutions, clinics, Government agencies, advocacy organizations, and pharmaceutical companies. The core mission of the group is to "promote and facilitate expedience and efficiency in research about HIV disease in women by producing a coordinated effort across disciplines and organizations." (Core mission statement copied

from The Well Project Web site.) While attending my first WRI meeting in Salt Lake City, Utah, in the fall of 2007, I gained a better understanding of the work being endeavored to shift the paradigm toward a more equitable representation of women in studies. (A recent correspondence with The Well Project indicated the release of a white paper on these accomplishments is anticipated this summer.) However, I left that workshop asking a question: "How do we communicate the value of clinical studies to HIV-positive women?" These, and other important questions, are on the minds of advocates on a daily basis. Our concerns are aptly stated by David Gilden, author of an excellent "backgrounder" for the WRI: "From bench science to postmarketing trials, lack of research on AIDS in women hobbles our efforts to halt the HIV epidemic. Whereas activists once saw such studies as a way to achieve early access to experimental treatments when those were our only hope, now we can see this research as a matter of scientific equity."

My personal journey continues as a human subject of five separate clinical research studies. I am grateful to those professionals who have been generous with their knowledge and their time to help me understand more about the science behind the research, HIV, and the industry. I appreciate the dedication and determination they apply to make discoveries toward unveiling the mysteries of HIV and the challenge it poses to the human immune system. I am aware of the constraints due to funding issues faced by many research entities, and am pleased to learn about recent increases to the NIH budget from the Congress. And, for each news release about the inflow of private funds from the Gates Foundation toward vaccine research and development, or the remarkable donation made earlier this year to Massachusetts General Hospital for the creation its new Ragon AIDS Vaccine Institute, I feel as if we are witnessing a golden age of research in this 30th year of the epidemic.

In summary, these are my recommendations to the NIH:

- Support clinical trial or study sites to provide necessary means to improve participation of women.
- Establish statistically meaningful enrollment targets for studies of particular relevance to women.
- Increase the amount of funding necessary to support research to develop a microbicide.
- Implement policies that reduce the income and education inequalities on health care and that narrow gender disparity.
- Design studies to overcome historical barriers to enrollment of women using novel strategies that minimize financial burdens with per diems for childcare and travel.
- Establish novel recruitment and retention strategies similar to those employed by the GRACE Study.[1]
- Increase studies on the susceptibility influences of HIV in women, i.e. hormonal, cellular signaling, cytokines, and the like.
- Mandate that consent forms be composed at an 8th grade level of comprehension, with culturally relevant and appropriate language.

- Advocate for the education of clinicians and encourage their "Internet savvy."
- Collaborate with the advocacy community on trial/study design and invite their input in Protocol Team Investigator Meetings and participation on Data Safety Monitoring Boards (DSMBs).
- Ask the question: "Do women progress to AIDS faster than men?"

Loreen Willenberg is the Founder and President of the Zephyr L.T.N.P. Foundation, Inc., a community-based organization headquartered in Sacramento, California. The foundation is established to assist scientific investigators in their search for HIV controllers, provide assistance to the HIV Controller community who wish to contribute to clinical research studies to advance developments toward a therapeutic vaccine for HIV infection, foster community and connectivity within the HIV Controller subgroup, and maintain the HIV Controller topic in the public view. For more information about this effort, please visit the foundation Web site at http://www.zephyrfoundation.org.

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KEN CHISHOLM

Self

The Prevalence of Dismissive Tendencies by Physicians in Assessing and Rendering Inaccurate Diagnosis Leading to Irreversible Illness in Women Based on Their Age and Sex Demographics

I have nearly 25 years' experience in orthopedic medicine, clinical and surgical. I am also the husband and caretaker of my wife, who has disseminated Lyme disease and its coinfections, babesiosis and ehrlichiosis, for 8 years.

We spent the first 2 years going from M.D. to M.D. (male and female), searching for a diagnosis or even a viable "differential" to pursue. All but one dismissed her as being a middle-aged hyper-hormonal female with "psychosomatic" based health issues! The "best" they could do was to recommend a psychologist.

So our entire lives have been devastated by the following:

- Incompetent physicians
- Sex prejudice
- Lack of "cookbook and recipe" medicine
- Inability to think beyond what was taught in medical school
- Lack of initiative to open a book, conceding the notion they don't know it all

I found the entry for Lyme disease in a 10-year-old University of California–San Diego discarded spiral-bound "clinical therapeutics" companion book, as being noted in the "differential" for a patient presenting with her array of symptoms.

Is it asking too much of physicians to listen to subjective complaints, take a good history, and ask questions in a manner such that psychiatric patients can be filtered out? This mentality is disgusting, ridiculous for our nation, and devastating to all connected with "middle-aged, hyper-hormonal" women.

Finally, given all the above, I put her on a plane from San Diego to Boston, based on that outdated medical therapeutic manual, my observations, and despite repeatedly being told "there is no Lyme disease in California!" We've been through hell with this disease, based on the simple-minded bias of physicians noted above.

She recently fell, suffered C-1 and C-2 spinal and anatomic neck of the humerus fractures stemming from Lyme encephalopathy, a condition one of the "brilliant" neurologists who saw her during her 2-week stay in the intensive care unit (ICU) for uncontrollable seizures concluded was, "not possible for patients who take their anti-seizure meds properly."

Only problem with that theory: She was in ICU getting all her medications from them for those 2 weeks!

BEVERLY SANTOS

Self

Women's Health Should Include Lyme Disease and Associated Tick Coinfections

Lyme Disease Rocked My World—And Not in a Good Way!

I am writing to all the local newspapers today with this new information on Lyme disease and tick-borne coinfections. This news is very important to all Lyme disease patients and to anyone who suspect they may have the disease. I have lived in Tulare County for more than 30 years. I worked with veterinarians for all of those years. We treated hunting dogs and everything in between. I was also an avid camper/hiker in the Sierras and all over the State of California. I was an involved athlete, participating in activities such as snow skiing, water skiing, and softball. I have spent at least the past 20 years going from one doctor to another in the area trying to figure out what was wrong with me. I have been told everything from it being all in my head and just learn to live with the pain, to arthritis, to multiple sclerosis, to fibromyalgia, and several other things in between. Because I have some medical background, I had a hard time believing these. I ended up being labeled with fibromyalgia, which I don't believe is a disease. It is a group of symptoms that doctors cannot explain so they labeled it. That way, doctors don't have to think about it anymore. While a lot of people may believe this diagnosis, I do NOT and have continually kept vigilant on finding an answer. I was about to give up after visiting a highly respected clinic in Santa Barbara that gave me the same diagnosis. I came home depressed and resigned to being dismissed and figured I'd just die without knowing, until I happened to watch

a TV program called “Mystery Diagnosis” on TNT. I had all the symptoms and thought, “What the heck?” I have nothing to lose by going to one last doctor. The doctor was in New York City. I made an appointment and went with nervousness and trepidation. I told him my life history (an hour and a half appointment) and he discussed how we should proceed. This disease is VERY hard to diagnose. The laboratory testing that is used by most doctors is NOT effective. Therefore, diagnosis must be made by patient clinical symptoms and patient history along with laboratory tests. There are very few labs that check the proper tests and Igenex lab is one. To make a long story short, my western blot was positive. So I finally had a diagnosis.

Now I have a diagnosis! Yippee! Well, that’s what I thought until I started finding out that there are very few doctors who actually treat this horrible disease. Not only that, but there is a terrible political battle going on between infectious disease doctors and the Lyme-literate doctors. The Centers for Disease Control and Prevention (CDC) is also involved and sides with the infectious disease society, whose insurance standards guidelines go by. This makes our treatment protocol mostly out-of-pocket costs even when we have “good” insurance. The insurance companies deny doctor visits and services and a lot of drugs that are vital to our improvement. Sufferers know that we will never be totally cured of the disease, but we can get better (remission), hopefully, enough to have decent quality of life.

I am attempting to educate the people of California and Tulare County, specifically. There are numerous people in the area who have been successfully diagnosed and yet the doctors in the area continue to tell people that California doesn’t have a problem with these diseases. For more information, you can check out several Web sites with very good information, keeping in mind that government agencies will suggest that the occurrence is low, but that is wrong. The CDC admits only 10 percent of cases are reported. See the following Web sites for more information:

http://www.lymedisease.org, http://www.ilads.org, http://www.lymenet.org

LYNN SHEPLER, M.D., J.D.

Self

Recommendations for Research for the Next Decade

I am writing pursuant to your call for recommendations for research for the next decade. I have three concerns: 1) chronic fatigue syndrome; 2) Lyme disease; and 3) the lack of advancement of women physicians in academic departments. I am a Yale-trained psychiatrist, and formerly practiced on Cape Cod in private practice until I acquired Lyme disease in 1996. I am presently disabled from Lyme disease.

Chronic Fatigue Syndrome (CFS) Is not a Psychological Disorder

I am concerned that there are those who seek to make chronic fatigue and immune dysfunction syndrome into a psychological disorder and do not want to pursue other paths looking for a physical cause for this illness. I particularly do not like the research that has been coming out

of University of Medicine and Dentistry of New Jersey. I have read some of the research on this disease, and other research clearly points to immunological changes and underlying viral reactivation. The reason is, why? It is very destructive to have this line of research that speculates about a psychological cause. But please note that UMDNJ has a large employment health section that receives large monetary contributions from insurance companies and employers. It seems to me that UMDNJ, as an institution, has undeclared conflicts of interest because they take insurance money. New Jersey is the capital for many insurance companies, particularly disability insurance companies.

If CFS is "determined" to be caused by psychological factors, then disability insurers are off the hook. Most disability policies state that they have no obligation to pay longer than 2 years for disease states that are caused by psychological factors. Thus, many of these patients with CFS—who have a disease truly caused by physical factors, but the etiology has yet not been well described—will be denied disability insurance benefits. This is something the NIH needs to keep in mind.

In the past, when women's diseases have been poorly understood, they have been typically attributed to psychological etiologies.

I recall when menstrual cramps were not understood, that the standard textbook on Ob/Gyn written by Ralph Wynn, M.D., stated that menstrual cramps were caused by psychological factors, i.e., that a woman had psychological conflicts about being a woman, that she did not want to be a woman, and that she should thus be sent off to a psychiatrist.

Later it was discovered that, after putting pressure gauges in women's uteri, menstrual cramps were associated with very high uterine pressures. This was around the time that Motrin was discovered, as was the physiology of prostaglandins. Women with menstrual cramps were also found to have high prostaglandin levels. Therefore, they were administered Motrin and other nonsteroidal anti-inflammatory drugs, and lo and behold, menstrual cramps were ameliorated! They were eventually found to have a physical etiology.

It is sad that women had to endure that physicians projected onto them a "psychological" basis for these physical problems, but that is sexism in medicine in the 20th century.

Now we are facing sexism in the 21st century, by physicians and other practitioners trying to make CFS into a psychological disorder. I could not disagree more with this line of speculation.

Lyme Disease Is a Women's Health Issue

Unfortunately, virtually all of the researchers or "thought leaders" on Lyme disease are male. There have been no studies looking for sex differences in Lyme disease. Yet, I believe they exist, particularly in adults. As you know, there are Federal laws requiring that sex differences be looked for with respect to new drugs on the market; however, there are no Federal regulations that mandate that researchers look for sex differences in laboratory test kits that are submitted to the Food and Drug Administration. This needs to change.

Based on what I observed in my medical practice on Cape Cod, I am concerned that adult females may not have as vigorous an antibody response to the disease as do males. I am also concerned that there are more females than males who are disabled from chronic manifestations of the disease. No one is studying this or is interested in studying this.

I believe none of the "thought leaders" on Lyme disease are interested in studying this because virtually all of them are involved in doing consulting work for pharmaceutical companies, and/or the NIH on Lyme disease vaccines. If they discovered there are sex differences, for example, in Lyme disease testing, this would complicate the model they have for rolling out a Lyme disease vaccine.

In conducting an experimental Lyme disease vaccine trial, first one must determine whether someone is infected with the organism. This is very difficult to determine at present, given the inaccuracies of the testing. But if there were sex differences in the testing, this would complicate the issue further.

The "thought leaders" are also trying to do away with the category of "chronic Lyme disease" because it does not fit with their business model of the disease. Chronic Lyme disease assumes there is such a thing as persistent infection in the face of antibiotic administration. This also complicates their business model for the Lyme disease because the "thought leaders" would like to be able to assume that every person who lines up to take an experimental Lyme disease vaccine has no infection with the organism, whether infection by asymptomatic, subclinical, or clinical in nature. This is because in the previous Lyme disease vaccine trials, many people who were already infected with the organism became ill after infection with the vaccine antigen; some became extremely ill.

It was postulated that injection with the experimental antigen caused a latent disease to become reactivated.

I have always watched Lyme disease support groups and noted that they are dominated by females. Most of these people are chronically ill with tick-borne illness. Few are males. I believe there needs to be an honest study of this population.

A researcher named Brian Fallon, M.D., an associate professor at Columbia University, has noted sex differences in patients with chronic Lyme disease. He is the only researcher to have looked at this issue.

Lack of Advancement for Women Physicians in Receiving Federally Funded Extramural Research

I do not know what the statistics show about the percentage of females receiving federally funded, extramural research dollars, but I do know that not enough female physicians are advancing in their careers. This may be for complicated reasons, but it is disappointing to observe. The Office of Research on Women's Health should do what it can to change this.

Summary

1. CFIDS is not a psychological disease, and NIH funding should not be spent on pursuing research that is trying to make this the dominant paradigm.
2. The Office of Research on Women's Health should take a look at Lyme disease and foster examination of whether there are sex differences in the disease, particularly laboratory testing for Lyme disease, and for those who are disabled from Chronic Lyme disease.
3. The ORWH should do what it can to increase the number of female physicians who receive Federal funds for extramural research.

Public Testimony
The Warren Alpert Medical School of Brown University
Providence, Rhode Island
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Environmental Risks to Women's Health

Today in the United States, a woman is diagnosed with breast cancer every 3 minutes. Another woman will die every 11 minutes.[1] The epidemic has been rising for the past 60 years.[2] Not slowly, but rapidly, breast cancer has taken an increasing number of women's lives—not only the old and frail, but also the young and healthy, mothers with small children, and leaders in every field. In 1940, around 1 in 24 women who lived to be 80 was afflicted. In 1964, 1 in 20 women who lived to be 80 would get the disease.[1] By 2006, that number reached 1 in 8. Breast cancer is the most common killer of middle-aged women in the United States, Canada, and northern Europe. There were an estimated 184,450 cases of invasive breast cancer diagnosed in 2008 alone.

As a society, we face a mandate to heal the many women and men who get sick each year. Yet, breast cancer is only one of many illnesses that women face that is linked to a rising tide of environmental exposures. Chemicals are ubiquitous in our environment. Eighty thousand chemicals are currently in use today. Approximately 2 percent of them have been tested for safety.[3] Our massive exposure to chemicals causes cancers, brain disorders, nervous system malfunction, autism, skin rashes, respiratory problems—an endless number of illnesses. Recent research has shown that these exposures are particularly potent when encountered in utero, infancy, early childhood, or adolescence. Toxins add up in individuals and in entire populations.

However, as Rose[4] claims, "current policy assumes that this is not the case." In other words, most research and policy treats the individual as an isolated case. This trend is now shifting toward an even more minute level, to genetics, drawing farther away from the environmental factors that flip genetic switches. A vastly disproportionate amount of funding is funneled into these topics, while work directed at public health and environmental exposures has been marginalized. The vast majority of the research stimulated by Nixon's 1972 call to battle a "war" against cancer has used a biomedical approach. It puts most stock in individual-level risk factors for breast cancer like genetics and lifestyle. What this approach misses, however, is the fact that genes do not function in isolation of their environment. Genetic mutations that are the cause of illness are generally triggered by something in the environment, either in utero or during a person's lifetime. Without knowing what triggers a genetic change, knowledge of genes may be useless.

Environmental studies are harder to conduct, are harder to draw conclusions from, and therefore win fewer prizes and gain less of the elusive grant money on which scientists depend. But scientists are attempting to move in new directions, constructing new tools, testing new hypotheses, and discovering new toxics. Their research has received harsh criticism, and their professional credibility has been challenged. They need the support of the Federal Government to conduct this risky work. Now is the time to support increased funding for research that investigates the environmental links to breast cancer and to answering questions about what exposures in our environment are causing illnesses in women's bodies. Only with this research can a stronger case be made about the importance of regulation.

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SCOTT L. TOMAR, D.M.D., DR.P.H.

American Association of Public Health Dentistry

The Importance of Oral Health to Women's Health

The mission of the American Association of Public Health Dentistry (AAPHD) is to improve the oral health of the public through education and leadership based on the principles of dental public health. The major goals are as follows:

- To promote and support new and existing educational and other programs and policies that are effective in oral disease prevention, health promotion, and the provision of services
- To promote and support education about the importance of oral health and its relation to overall health and well-being
- To develop and maintain competency in the practice of dental public health and to provide continuing dental education opportunities for association members, residents, and graduate students in dental public health
- To promote and support the expansion of the knowledge base for the practice of dental public health, to encourage studies relevant to dental public health, and to support the American Board of Dental Public Health
- The Association's standing Committee on Science and Education serves with the following roles:
  - To lead the reviews of policies and papers requested by professional organizations and government agencies
  - To seek out opportunities for the AAPHD to comment on policies and papers developed by other organizations and government agencies
  - To assess current evidence and suggest topics for future policies and position papers that AAPHD should consider developing

The Association is also the sponsoring organization for the *Journal of Public Health Dentistry*.

The above information is provided to help place in context the seriousness of AAPHD's role in the oral health status and determining factors for populations toward achieving optimal oral health for all in the United States.

Women and Oral Health

A number of reports and studies have shown that women have special oral health needs and considerations. Hormonal fluctuations have a surprisingly strong influence on the oral cavity. Puberty, menses, pregnancy, menopause, and use of contraceptive medications all influence women's oral health and the way in which a dentist should approach treatment.

While women tend to take better care of their oral health than men do, women's oral health is not markedly better than men's. This is because hormonal fluctuations throughout a woman's

life can affect many tissues, including gum tissue. During puberty, fluctuations in hormones can make gums more susceptible to gingivitis. As a result, the gums may appear red and swollen, and they can bleed. During menstruation, women who have a tendency to develop canker sores and cold sores may develop a pattern in which these sores recur during every menstrual cycle.

A study published in the January 1999 issue of the *Journal of Periodontology* reports that at least 23 percent of women ages 30 to 54 have periodontitis (an advanced state of periodontal disease in which there is active destruction of the periodontal supporting tissues). In addition, 44 percent of women ages 55 to 90 who still have their teeth have periodontitis.

Because periodontal disease is often a "silent" disease, many women do not realize they have it until it reaches an advanced state. During pregnancy, gingivitis may develop. In fact, gingivitis is the most common oral condition associated with being pregnant. Also during pregnancy, the chemical composition of saliva changes, thus reducing saliva's antimicrobial capacity. Sometimes, however, women will avoid dental checkups for fear that treatment might harm the developing baby. In fact, untreated decayed teeth can put a mother and her baby at risk for infection.

Men, Women, Children, and Oral Health

Oral health is a critical component of overall health[1] and AAPHD is working diligently to see that it is included in any efforts to reform the healthcare system.

According to the Centers for Disease Control and Prevention (CDC), dental decay is the most common chronic disease in children, and 92 percent of adults age 20 to 64 have decay.[2] The irony is that dental disease is largely preventable. This problem has been ignored for far too long.

Oral health problems cause pain; impact our ability to eat, sleep, work or get a job, and concentrate in school. Evidence suggests that poor oral health can complicate or is linked to diabetes; heart disease; pneumonia; stroke; and preterm, low birthweight babies.[3]

Unlike many medical conditions that are self-limiting (i.e., they run their course without the necessity of a medical intervention), untreated oral diseases typically become more serious, more difficult, and more expensive to treat. The consequences of not treating oral disease extend well beyond the more obvious oral health consequences such as the severe pain of a toothache (which has been characterized as one of the most excruciating types of pain) and inability to chew food, to the more serious general health consequences of severe systemic infections, psychosocial problems, impaired nutrition and weight loss, severe disfigurement, and even death.

Because the earliest manifestations of HIV disease often occur in the mouth, dental professionals play a critically important role in the early detection of this disease. Early detection means earlier therapeutic intervention is possible, thus extending the productive lifespans of affected individuals and improving their quality of life. Early detection also reduces the opportunity for further transmission of HIV. Not covering adult dental benefits will decrease the

likelihood of early detection of HIV and increase the likelihood of less productive lifespans and decreased quality of life for HIV-infected individuals.

Oral cancer is more common in older Americans than leukemia; melanoma; Hodgkin's disease; and cancers of the brain, liver, bone, thyroid, stomach, and ovaries. Oral cancer kills more Americans every year than cervical cancer.[4]

People with disabilities are at greater risk for oral diseases and are less likely to be treated. One of two persons with a significant disability cannot find a professional resource to provide appropriate and necessary dental care.[5]

Universal coverage must include universal dental coverage for both children and adults. For every child without "health" insurance, 2.6 are without dental insurance. For every adult without health insurance, three are without dental insurance. We cannot improve access to care without enhancing coverage.[6]

The mouth is the only part of the body the care for which a physician is not responsible, yet it is only because of an accident of history that medicine and dentistry became unique professions. It is irrational to reject coverage of one part of the body because the health professionals most qualified to diagnose and treat it are dental professionals. Only dental professionals are qualified to diagnose and treat the pain and infection of conditions arising in the mouth. When an individual presenting with pain or a dental infection is seen by a physician in a hospital emergency room, typically the treatment provided is prescription of an antibiotic and pain medication. Such treatment does not address the underlying condition and serves only to delay definitive treatment, thereby making it more difficult and costly to treat.

Less than one in four (24 percent) Americans ages 65 and older are covered by private dental insurance. Most seniors have no dental coverage since Medicare doesn't offer a dental benefit.[7] Because the Federal Government defines adult dental services in Medicaid as "optional," most States don't cover adult dental services through Medicaid, and of those few that do cover them, many are eliminating these benefits in the face of severe budget shortfalls. In 2007, only 16 State Medicaid programs offered reasonably comprehensive dental benefits to adults, 16 offered only emergency dental services, and 6 provided no benefits at all.[8] Since then, more States have cut adult benefits. As of July 1, California cut most dental benefits for adults, affecting some 3 million Medicaid beneficiaries.

Veterans have no access to oral health care through the U.S. Department of Veterans Affairs system unless they have a service-related oral injury. The fact that many of them started smoking while in the service and thus face much higher risk for tooth loss and mouth cancer is not considered.

Millions of dollars are wasted by inappropriate visits to hospital emergency rooms for dental pain and infection. These visits do not result in dental treatment, and only contribute to overuse of antibiotics and pain medications.

If an adult has an infection on an arm, leg, neck, or even inside the mouth on the tonsils, their medical insurance and the health coverage that would be available to all adults under health-care reform would cover it. If the same adult has an infection on the gums, an inch away from the tonsils, and inches away from the brain, and it requires treatment by a dentist, it wouldn't be covered. A rational health system would not ration care based on parts of the body.

Clearly much work is needed if we are truly committed to eliminating oral health disparities in this country. However, the more than 1,000 members of the American Association of Public Health Dentistry believe it can be done and stand ready to make it happen!

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American Autoimmune Related Diseases Association

Reproductive Health and the Environment

Introduction

As a disease category, autoimmune diseases are currently all in the top 10 leading causes of death in women from the ages of 15 to 64. While these diseases do affect men also, the ratio is highly disproportionate, with autoimmune diseases affecting women 75 percent more often than men.

According to the National Institutes of Health (NIH), 23.5 million Americans suffer from some form of autoimmune disease, of which there are more than 80. These include lupus, type 1 diabetes, celiac disease, multiple sclerosis, and Crohn's disease. Autoimmune diseases can affect every system in the body. While all are connected by the common thread of autoimmunity, their symptoms can vary widely from disease to disease and often within a single disease as well, making them difficult to diagnose and often overlooked until the damage has become terminal or has irreversibly affected a patient's quality of life.

Today, too little is known about autoimmune diseases and their common pathogenesis of autoimmunity. As the NIH and the Office of Research on Women's Health (ORWH) explore areas of greatest concern for women, the American Autoimmune Related Diseases Association (AARDA) implores you to include autoimmune diseases as one of your primary platforms for future research and exploration.

While there is a fundamental need for increased research across the board for the general pathogenesis of autoimmunity that connects these more than 80 diseases, AARDA particularly would like to see increased evaluation and research in the following areas:

Current research tells us that autoimmune diseases are on the rise in the United States as well as around the world. More work needs to be done to investigate the cause of such increases, which include genetic predisposition and environmental triggers. Consistently, autoimmune diseases continue to be a major health concern for women at a higher incidence than for men, and too little is known about why women are affected in such disproportionate numbers. Much more work needs to be done to investigate another disparity of why certain autoimmune diseases, especially among women, affect minority populations at higher rates, as well as higher levels of severity, than are experienced by other populations.

More research and investigation are needed to analyze the effects of pregnancy, infertility, and lactation as they relate to autoimmune diseases, as well as the relationship of endocrine disorders and autoimmune diseases.

Autoimmune Diseases on the Rise

According to several studies conducted in the United States and around the globe, the incidence of many autoimmune diseases is rising. A study titled, *Incidence of polymyositis-dermatomyositis: A 20-year study of hospital diagnosed cases in Allegheny County, PA*

1963–1982[1] showed the incidence of polymyositis-dermatomyositis more than tripled during this time period, and notably, the most substantial increase took place among African-American women. In another study, *Increasing prevalence and incidence of multiple sclerosis in South East Wales*,[2] the prevalence of multiple sclerosis was found to have increased 45 percent over the past 20 years. Additionally, a study found that the overall incidence of systemic lupus erythematosus (SLE) in Maryland had increased twofold over a comparable study done in New York City 15 years ago.[3] In Finland, type 1 diabetes has more than doubled in children in the past 30 years;[4] and in the United States, a Mayo Clinic study found that celiac disease today is more than four times more common as it was in the 1950s.[5]

This growing trend should be of great concern because while there is revealing evidence that autoimmune diseases are increasing in frequency, still very little is known as to why. Compelling past research has shown that autoimmune diseases may be on the rise due to triggers in our environment in those who have a genetic predisposition to the development of autoimmune diseases.

Genetic Predisposition and External Triggers

All autoimmune diseases are genetically interrelated, tending to cluster in individuals and families. An individual's susceptibility to autoimmune diseases is determined by his/her set of genes. However, studies on identical twins show only a 30–50 percent concordance in autoimmune disease expression. Therefore, genetic makeup alone does not determine whether someone will "get" an autoimmune disease. There are other risk factors, external to the body, involved in initiating and exacerbating the disease process. As we have shown through current research trends, it is a common belief that autoimmunity is, in fact, on the rise. While one-third of the risk of developing an autoimmune disorder lies in one's genetic makeup, the remaining causes are thought to be noninherited and may contain several environmental factors. For example, exposure to certain metals, such as mercury, gold salts, and silver, are thought to induce lymphocyte proliferation and subsequent autoimmunity.

While our current understanding of the role that environmental factors play in the autoimmune attack remains rudimentary, a wide range of triggers have been implicated in autoimmune disease expression, including the following:

- Viral and infectious agents
- Broad groups of chemicals
- Heavy metals
- Iodine
- Organic compounds (including PCBs and estrogenic compounds)
- Phthalates
- Pharmaceuticals
- Pesticides

- Some foods such as cow's milk
- Ultraviolet radiation

More research in this area is required to fully understand this relationship, which affects millions of Americans at an increasingly higher rate each year. It is imperative that we understand the full range of environmental triggers and the role they play in the autoimmune process. Understanding how environmental factors fit into the autoimmune attack puzzle may provide approaches to preventing these diseases or reducing their severity. This is certainly more desirable than trying to control an ongoing autoimmune attack with immunosuppressive drugs that expose patients to many well-known serious side effects.

AARDA, therefore, strongly recommends to the ORWH/NIH that a coordinated research program be initiated to better understand the role of environmental triggers across the family of autoimmune diseases. The ultimate goal of this program is the development of approaches to prevent autoimmune diseases or decrease their severity, thereby minimizing the very serious financial and societal burdens they place on our healthcare system and on afflicted individuals and their families.

Women and Autoimmunity

Autoimmune diseases affect women disproportionately more often than men, some diseases as high as 9:1. Although there has been some research into sex bias differences in autoimmune disorders, there is no substantial research into this area. It is commonly thought that hormones may play a significant role in the unbalanced nature of the diseases in women in comparison to men. For example, many autoimmune diseases seem to occur more often in women at puberty and at menopause and other disorders may significantly improve during pregnancy with no outward provocation. Although these findings seem to point to an obvious link, the role of hormones in autoimmune disorders has not been conclusively proven. Recent findings indicate a need for more research concerning pregnancy influences on the incidence and natural history of autoimmune diseases.

Hormones, Women, and Autoimmune Diseases

Women are affected by autoimmune diseases 75 percent more often than men, and while this is common knowledge, still very little is known about why. Sex hormones, including estrogen, prolactin, and testosterone, have been found to play an important role in triggering these diseases. While researchers have some understanding that hormones like estrogen can enhance autoimmunity and have various effects on the immune system, its behavior in response to certain autoimmune diseases is not clear.

For example, one study found that a small increased risk of mild/moderate flares in women with SLE who were taking hormone replacement therapy (HRT). However, there seems to be no increased risk of major flare ups in SLE patients taking HRT. In addition, in patients with rheumatoid arthritis, HRT is not associated with an increased risk of disease flare and may actually improve disease activity.

Additionally, another study analyzed the effects of prolactin production in breastfeeding women. Persistent mild to moderate elevations in serum prolactin were found to have been the cause of a break in self-tolerance in female mice, showing a possibility that women producing prolactin could be at risk of overactive autoimmunity. Additionally, some autoimmune diseases have been shown to improve during pregnancy, while others show significant flares after pregnancy. For example, women with autoimmune disease and become pregnant can experience amelioration of the mother's disease, such as rheumatoid arthritis, while the pregnancy exacerbates or has no effect on a disease like SLE.

Clearly, hormones have a role to play in the triggering of an autoimmune reaction that leads to an autoimmune disease. Because of the overwhelming disproportionate ratio of women to men in autoimmune diseases, in women it is imperative that more work be done in research to uncover how these diseases are being triggered and what we can do to inhibit those reactions.

Endocrine Disruptors and Autoimmune Disease

Further evidence that hormones may play a major role in the increased incidence of women with autoimmune diseases lies in data that suggest endocrine disruptors affect both the reproductive system and the immune system, according to a study, *Endocrine disruptors (environmental estrogens) enhance autoantibody production by B1 cells*.[6] The results of this study indicate that endocrine disruptors are, in fact, involved in autoantibody production by B1 cells and may be an etiologic factor in the development of autoimmune diseases. Endocrine disruptors such as BPA enhance autoantibody production by B1 cells, both in vitro and in vivo.

In addition, another commonly found endocrine disruptor, diethylstilbestrol (DES), has been linked to increased levels of arthritis and lupus where there has been prenatal exposure to DES leading to immune impairment. In general, research has found that women prenatally exposed to DES appear to have a higher incidence of autoimmune diseases when various autoimmune diseases are grouped (S. Ansar Ahmed). Since DES was most commonly prescribed for women to treat gonorrheal vaginitis, atrophic vaginitis, menopausal symptoms, and postpartum lactation suppression to prevent breast engorgement, there is ample evidence that it has led, in part, to the disproportionate rate at which women develop autoimmune diseases.

As autoimmune diseases increase in the United States and around the world, this problem requires an increased level of research and investigation into known hormonal triggers such as BPA and DES.

Infertility and Autoimmune Diseases

Autoimmune disease is a major cause of pregnancy loss and infertility among women in the United States. Studies have investigated many of the factors surrounding infertility and autoimmune diseases, such as antiphospholipid antibodies, antithyroid antibodies, antinuclear antibodies, antisperm antibodies, and antiovarian antibodies.

Antiphospholipid antibodies and recurrent pregnancy loss is an established connection with treatment options available for women. However, much work is still needed to analyze this as

well as other autoimmune factors and their repercussions for infertility, pregnancy loss, and in-vitro fertilization.

One study, *Antiphospholipid syndrome and recurrent miscarriages*,[7] posits that 7–25 percent of recurrent spontaneous abortions (RSA) can be accounted for by antiphospholipid syndrome (APS) as the main risk factor. Additional studies have found that APS is not only associated with RSA, but also with infertility. New mechanisms are described in this study by which antiphospholipid antibodies (aPLs) could cause placental thrombosis and infarction, acting directly on the surface anticoagulant expressed on trophoblastic cells. It was found that testing for additional aPLs remains an important objective to understanding their role in RSA.

Another study analyzing the role of antiphospholipid antibody-mediated recurrent pregnancy loss has shown that there is an evident association in both humans and murine models. The study found that pregnancy loss could result from diverse autoimmune factors, such as inflammation.

When analyzing whether there is a role in autoimmunity in implantation failure after in-vitro fertilization, scientists found that antinuclear antibodies may be a marker for underlying autoimmune disease when coupled with certain signs and symptoms. Additionally, the study found that antisperm antibodies are associated with fertilization failure when found in high titers in seminal plasma, in sperm, or in the mucosal immune system of women. Antisperm antibodies are uncommon generally; however, they are most often associated with ovarian hypofunction.

Clearly, there is a fundamental role played by autoimmunity in the infertility and pregnancy loss of women and more work needs to be applied here by ORWH to explore further what these and other studies of their kind are beginning to discover. A study titled, *Bidirectional effects on autoimmunity and reproduction*[8] came to the following conclusion, which AARDA fully agrees with: "Integration of mechanistic and clinical information by multidisciplinary teams is needed to manage reproductive issues in women with autoimmune diseases."

Autoimmune Diseases in Minority Populations

Another area of increasing concern that has been under-studied and under-analyzed is the question of why some minority populations are disproportionately affected by certain autoimmune diseases. For example, research has shown that lupus nephritis is found to be more common, with increased levels of severity, in African-American women. Additionally, despite aggressive immunosuppressive therapies employed in lupus nephritis in this patient population, there is also a higher incidence of progression to end-stage renal disease according to the study, *Lupus nephritis in African Americans*.[9] Factors such as genetics have been found to play a role in explaining why African-Americans appear to be at higher risk for lupus nephritis.

Research supported by NIH found that African Americans are more likely to have a less efficient Fc receptor gene. This work will greatly increase the ability of scientists to begin studying ways to better predict those who have a higher level of susceptibility to lupus nephritis. This is an area where additional research could lead to viable options for treatment and early detection. Discovery of a genetic explanation for the disproportionate rate at which

African Americans are affected by lupus nephritis is groundbreaking; however, still too little is known regarding the effect environmental triggers have on those with a genetic predisposition to autoimmune disease. Further study in this area could also help to discern the increased levels of severity of lupus nephritis in African Americans.

In a recent study, *Nursing home residents with multiple sclerosis: Comparisons of African-American residents to White residents at admission,*[10] it was found that African-American patients admitted to nursing homes with multiple sclerosis (MS) were found to be significantly younger, have a higher degree of cognitive impairment, and be considerably more physically disabled than White residents. The study also found that while the differences in the White and African-American MS populations were vastly different in severity, there was no notable difference in the use of various therapies provided by quality therapists. The outcomes of this study require a great deal of additional research that AARDA would encourage the National Institutes of Health to support.

More research and collaboration is needed in the areas of genetics, immunology, epidemiology, and virology to determine the pathophysiology of MS and its possible different effects on minority populations. Additionally, further research could uncover the possible need for outreach into the African-American community for disparities in MS-related care, thereby increasing treatment outcomes for this population.

While we have described very specific scenarios in which disease outcomes vary by race in both lupus nephritis and MS, we believe that this is an area that requires more attention. Both the preceding studies are further examples of the need to develop fully new and innovative tools such as personalized medicine to treat disease. Further research into locating and chronicling disease biomarkers in patients would help us to better predetermine treatment outcomes for various populations and could be the key to closing some of the racial disparities in treatments for autoimmune diseases.

Autoimmune Disease Biomarkers

AARDA asks that NIH focus considerable efforts into research on biomarkers for the more than 80 autoimmune diseases. There is a critical need for the creation of a database of autoimmune disease biomarkers. This database would assist in tracking the relation of biomarkers to disease severity. In addition, there is a need to develop a differential diagnostic technique to use groups of biomarkers to determine the presence of specific autoimmune diseases. This suggestion is based on the concept that autoimmune diseases can be determined by looking for groups of biomarkers as though they were chords played on a piano. There is also a need to expand autoimmune disease research to include the relationship between these diseases and other serious health conditions.

Awareness Through Education

We recommend that the NIH ORWH sponsor a cross-Institute scientific meeting to examine the latest in research on the issues discussed in this paper in order to identify additional areas of opportunity in autoimmune disease research.

About the American Autoimmune Related Diseases Association

The American Autoimmune Related Diseases Association is dedicated to the eradication of autoimmune diseases and the alleviation of suffering and the socioeconomic impact of autoimmunity through fostering and facilitating collaboration in the areas of education, public awareness, research, and patient services in an effective, ethical, and efficient manner.

AARDA is the only national nonprofit health agency dedicated to bringing a national focus to autoimmunity, the major cause of serious chronic diseases. Approximately 23.5 million Americans suffer from autoimmune diseases. Women are more likely than men to be affected; some estimates say that 75 percent of those affected are women. Still, with these statistics, autoimmunity is rarely discussed as a women's health issue.

Autoimmunity is a result of a misdirected immune system that causes one's own immune system to attack the self. There are more than 80 known autoimmune diseases; and unlike the many forms of cancer that are recognized as being part of the general term "cancer," autoimmune diseases are recognized singularly rather than in the overall category of autoimmunity. The public in general is unaware of the autoimmune nature of these diseases. When most people hear one of these diseases referred to as an autoimmune disease, they incorrectly confuse the term "autoimmune" with acquired immune deficiency syndrome, or they think it is a form of cancer.

This lack of knowledge and collaborative effort result in untold suffering for persons with autoimmune diseases due to misdiagnosis and delayed diagnosis, which may result in damage to vital organs. The need to bring a national focus to autoimmunity as the common factor in all autoimmune diseases is vital in order to bring a collaborative effort to research, funding, early detection, and eventually, prevention and cure for all autoimmune diseases.

Some of the more than 80 autoimmune diseases are lupus, type I diabetes, scleroderma, celiac, multiple sclerosis, Crohn's disease, autoimmune hepatitis, rheumatoid arthritis, Graves' disease, myasthenia gravis, myositis, antiphospholipid syndrome, Sjögren's syndrome, uveitis, polymyositis, Raynaud's phenomenon, and demyelinating neuropathies.

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American College of Nurse–Midwives

Supporting Women Across the Lifespan Through Research

The American College of Nurse–Midwives (ACNM) is pleased to provide testimony at this conference sponsored by the Office of Research on Women's Health (ORWH). ORWH lists many areas for future research consideration. We will specifically respond to the renewed emphasis on normal processes and therapeutic strategies of healthcare delivery. We will discuss how these may affect health during pregnancy, childbirth, and throughout a woman's lifespan. This testimony was written by representative leaders of the ACNM and reviewed by their Division of Research.

The mission of the ACNM is to promote the health and well-being of women and newborns within their families and communities through the development and support of the profession of midwifery as practiced by certified nurse–midwives and certified midwives. We affirm the power and strength of women and the importance of their health in the well-being of families, communities, and nations. Our philosophy supports the normalcy of women's lifecycle events, including watchful waiting and nonintervention in normal processes, and appropriate use of interventions and technology for current or potential health problems. However, the ability to support normal, physiologic processes in childbirth is becoming increasing difficult in our healthcare arena and deserves discussion before we suggest recommendations for future research.

Background

Current United States obstetrical practice follows the "1 percent" doctrine, focusing on the use of maximal resources to prevent extremely rare but disastrous outcomes.[1,2] Rosenblatt[3] describes this as the "perinatal paradox," where attention is focused on deviation from the physiologic norm rather than on elements relevant to everyday maternal and infant outcomes. This paradox has resulted in progressively more technology-focused birth care, but with mixed returns on investments. The mid-course review of the U.S. Healthy People 2010 goals shows we are actually moving away from projected targets in the rate of cesarean sections, both primary and repeat, in low-risk women; maternal complications during labor and delivery; low birthweight and very low birthweight infants; and preterm births.[4] High disparate racial and ethnic birth outcomes continue, and maternal mortality is rising.[5]

There is strong evidence to suggest that we widely overuse interventions with minimal beneficial effect and underuse those that are helpful.[6] Beneficial care practices supported by evidence include 1) unrestricted access to birth companions of the mother's choice, with emphasis on continuous emotional and physical support from a skilled woman and access to midwifery-led care; 2) freedom to walk, move about, and assume positions of choice during labor and birth and discouragement of the lithotomy position; and 3) nonpharmacologic methods of pain relief such as massage, hypnosis, and hydrotherapy.[7,8] Yet women are not routinely provided with these services and report experiences that reflect a growing trend of childbirth intervention.[9] The rate of labor induction has doubled since 1990 and the cesarean birth rate is at an all-time high of 31.8 percent.[10]

Although interventions are necessary for some labors and births, there is evidence to support that models of care in which these are minimized achieve superior outcomes to those commonly found in U.S. birth settings. A recent Cochrane systematic review of midwifery-led care across 11 randomized controlled trials (RCT) with 12,276 women suggests that the "type" of provider is associated with positive childbearing outcomes and decreased interventions. Women cared for in midwifery-led units were more likely to have a spontaneous vaginal birth, know their midwife, feel in control during labor, and initiate breastfeeding.[8] They were less likely to have regional analgesia, an episiotomy, or loss of an infant before 24 weeks. A randomized clinical trial of group prenatal care demonstrated a significant risk reduction in preterm birth, especially in the African-American population.[11] Washington DC's Family Health and Birth Center (FHBC) serves medically underserved, at-risk women in the heart of the District. An audit of their first 6 years showed substantial lowering of preterm birth, low birthweight, and cesarean birth rates, compared to those of the District at large (Ruth Lubic, personal communication, 2009). Comparative birth outcomes for African-American women were as follows: preterm birth (District: 15.5/ FHBC: 5 percent); low birthweight at term (District: 14.5/ FHBC: 3 percent); and cesarean birth rates (District: 31.5/ FHBC: 10 percent). Not only does this demonstrate substantial progress in decreasing disparate racial outcomes, it also represents a total cost savings of $1,635,248.[12,13] These models maximize perinatal outcomes through a focus on relationships between the clinician and the woman, and by supporting the normal, physiologic processes of childbirth.

Pregnancy, labor, and birth are just the beginning steps of becoming a mother and are placed within the spectrum of her life as a woman. Research indicates that the healthiest pregnancies occur when the pregnancy is desired and there is an appropriate interval since the last pregnancy. Thus, access to contraception and preconception planning are important contributors to healthy pregnancy outcomes. Maternal childbirth experiences can influence women's long-term emotional well-being and their ability to care for their infant. Our current childbirth practices are not associated with better psychological outcomes. Posttraumatic stress disorder (PTSD) is documented in almost 6 percent of women who indicate their birth experiences left deep, emotional scars.[14] United States surveillance data from 2000 of more than 400,000 women revealed that 50 percent reported low to moderate depression and 7.1 percent reported severe depression in the first months after giving birth.[15] This postpartum mental health morbidity also disparately affects minority women and those experiencing high levels of psychosocial stress during pregnancy.[16] It can illustrate how women's responses to interventions may link with their subsequent mental health.

A recent study by Declercq and colleagues[9] of 1,573 women found those who had cesareans were significantly more likely to have felt overwhelmed, weak, agitated, afraid, groggy, helpless, and less powerful during the birth process than those who did not. Less than half of the women recalled feeling confident or capable. Cesarean incision pain was cited as a major problem for 33 percent of the women at 2 months and 18 percent at 6 months postpartum. Another troubling finding was that many women were unaware, or had an incomplete understanding, of potential complications from childbirth interventions, including those that often are not medically indicated. Simkin[17,18] found that women's written accounts shortly after birth were strongly correlated with their memories 20 years later. Women with the highest levels of satisfaction felt more in control and believed that the experience contributed to their self-confidence and self-esteem. Satisfaction during childbirth has been associated with 1) personal expectations, 2) amount of support from caregivers, 3) quality of the caregiver-patient relationship, and 4) involvement in decisionmaking.[19] This suggests that it is not about what was done, but about how the women felt in terms of support and personal control.

Despite professional organizations' statements espousing evidence-based practice, care strategies supporting nonintervention in straightforward, healthy, physiologic labors and births are not widely used. Supporting low-technology, noninterventive birth care in today's healthcare arena is complex. Institutional childbearing care policies reflect far more than just the translation of research into practice. They are influenced by clinicians' attitudes and values, medical and malpractice insurers, administrative initiatives, and economics. A key variable in most birth settings is defining safe care and it remains an ongoing debate.[20,21] The Agency for Healthcare Research and Quality (AHRQ) defines "patient safety indicators" as problems experienced by patients resulting from healthcare exposures that are amenable to prevention.[22] One perspective rarely raised in maternity care is that unnecessary intervention in physiologic low-risk childbirth is potentially harmful, and therefore, can be identified as a safety risk. Thus, to effectively improve childbearing care and outcomes, it is essential to systematically examine the multilayered and multidisciplinary systems that comprise birth culture. There must be a commitment to "work with all of the stakeholders to implement comprehensive changes to the routine care of women during labor and birth" (p. 1380).[23] The challenge is to understand how

to provide safe, high-quality childbearing care without following the 1 percent doctrine of high technology for all. This includes providing skilled care in all aspects of childbearing, including perinatology for a woman carrying triplets; effective psychological care for a woman with PTSD; and skill in supporting normal, physiologic birth processes.

In response to the steady increase in technological interventions and operative births, particularly among women who choose elective primary cesarean, the National Institutes of Health (NIH) has recommended "increased research devoted to strategies to predict and influence the likelihood of successful vaginal birth, particularly in the first pregnancy" (p. 1393).[24] We believe this should be expanded to incorporate a life course perspective, in which short- and long-term benefits are considered when planning care for women, babies, and families to avoid harmful interventions.[6] This should not only support the "innate physiologic capacities of the childbearing process" (p. 29), but also must encompass a broader understanding of how to support normal, healthy physiology throughout a woman's lifespan.

As a nation, we are at the bottom tier of infant birth outcomes, despite spending more than any other country on health care. Models of care associated with best outcomes are not widely implemented. The health of our nation begins at birth and is fostered through family health; thus, research must be supported to understand how to best implement evidence and models of care to achieve our Healthy People 2010 goals, and beyond.

Recommendations

Our recommendations support a broad-based approach to examining strategies that foster the health of women across the lifespan, their infants, and their families. This includes understanding how to support their normal, physiologic processes and capacities, and implementing appropriate, evidence-based interventions when needed.

The ACNM participated in the Institute of Medicine's call for Comparative Effectiveness Research and supports the following priorities:

- Compare the effectiveness of interventions (e.g., community-based multilevel interventions, simple health education, and usual care to reduce health disparities in cardiovascular disease, diabetes, cancer, musculoskeletal diseases, and birth outcomes
- Compare the effectiveness of clinical interventions (e.g., prenatal care, nutritional counseling, smoking cessation, substance abuse treatment, and combinations of these interventions) to reduce incidences of infant mortality, preterm births, and low birthweight rates, especially among African-American women
- Compare the effectiveness of birthing care in freestanding birth centers and usual care of childbearing women at low and moderate risk
- Compare the effectiveness of innovative strategies for preventing unintended pregnancies (e.g., providing over-the counter access to oral contraceptives or other hormonal methods; expanding access to long-acting methods for young women; providing free contraceptive methods at public clinics, pharmacies, or other locations)

The ACNM further recommends that the NIH/ORWH support research that specifically does the following:

1. Examines care strategies that support the normal, physiologic processes of birth and their effects on short- and long-term maternal, infant, and family health outcomes
2. Identifies and conducts research to replicate exemplar U.S. models successful in decreasing the racial disparity in birth outcomes
3. Examines care strategies that support the normal, physiologic health of women throughout the lifespan
4. Fosters a national, standard, and systematic collection of data on childbearing care and outcomes
5. Examines women's decisionmaking processes on selection of providers and interventions during maternity and gynecologic care, with an emphasis on informed choice
6. Describes and replicates exemplar models in the effective translation of evidence into practice
7. Identifies legislative, political, and legal policies that promote or hinder the practice of midwifery to enhance access of care for all women in the United States

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THOMAS C. WRIGHT, JR., M.D.

American Society for Colposcopy & Cervical Pathology

ASCCP Testimonial on Management of Cervical Abnormalities in Adolescents

A 1½-day symposium with delegates from 22 organizations was held in Bethesda, MD, at the National Institutes of Health (NIH), under the sponsorship of the American Society for Colposcopy and Cervical Pathology (ASCCP) and in partnership with the American Cancer Society (ACS). The primary goal of the symposium was to identify strategies to increase the adoption of evidence-based consensus guidelines for cervical cancer screening and the management of abnormal cervical cytology and histology in adolescents and to identify key research areas. Both anecdotal reports and surveys of clinicians have verified an inadequate uptake of the 2002 ACS[1] and 2003 American College of Obstetricians and Gynecologists (ACOG) guidelines[2] on when to begin screening, and the 2006 ASCCP management guidelines pertaining to adolescents.[3-5] The guidelines specifically identified adolescents as a special population warranting different interventions based on published evidence that the natural history of abnormal cytology is different in adolescents than in adults. Adolescents were defined as women and girls under the age of 21.

Guidelines

The current guideline key messages are 1) human papillomavirus (HPV) testing is not recommended under any circumstances in screening or management of adolescents; 2) atypical squamous cells–undetermined significance (ASC-US) and low-grade squamous intraepithelial lesion (LSIL) should be managed similarly by repeat cytology only at 12-month intervals instead of immediate referral for colposcopy or HPV DNA testing; 3) cervical intraepithelial neoplasia (CIN) 1, CIN 2, and CIN 2/3 can be followed with observation rather than invasive therapies, whereas CIN 3 should be treated.

Evidence for Guidelines

HPV infections and LSIL are both extremely common in adolescent populations and commonly appear shortly after the onset of sexual activity.[6] There is now good evidence that in adolescents, more than 90 percent of HPV infections, LSIL cytology, and CIN 1 lesions will regress within 3 years.[7] This epidemiologic evidence strongly supports observation rather than intervention for adolescents with LSIL and CIN 1. In addition, papers showing that more than 70 percent of adolescents with ASC-US are HPV-positive[8] support the lack of evidence for using HPV testing that is not type-specific in any circumstance in adolescent populations. Evidence exists for the high rate of CIN 2 regression among adolescent populations[9] (A. B. Moscicki,

personal communication, 2009), with 60 percent showing regression within 3 years. Progression to cancer, even among those with CIN 3 appears to be negligible, as there are no published natural history studies in adolescents showing progression from CIN 2/3 to cancer. Published data show that adolescents have the highest rates of high-risk (HR) HPV-positive ASC-US and LSIL on cytology and the lowest rate of cervical cancer. SEER statistics show that between 1998 and 2006, an average of 14 cervical cancers occurred annually in girls aged 15–19 years, an incidence rate of 0.1 per 100,000.[10] This incidence rate is unchanged from that reported in the 1973–1977 period, which preceded the change in age to start screening to 18 or at first intercourse, whichever occurred first.[11] Because of this change in age to begin screening, adolescent populations went from no screening to considerable screening. There are also no data available to show that screening women less than 21 years of age impacts future rates of CIN 2/3.

A recent study in England showed that screening women aged 20–24 years old had no detectable impact on reducing cervical cancer rates in women under the age of 30 years.[12] This is consistent with previous studies demonstrating no change in cervical cancer rates in women under this age in numerous countries in the decades following introduction of cervical screening, compared to the dramatic reduction noted for all other age groups.[13]

Additionally, although incidence rates for cervical cancer peak at different ages for White, Black, and Hispanic women, all ages and races showed significant decreases in incidence between 1995–1999 and 2000–2004 for any of the race/ethnicity categories except for two subcategories: all-races women aged 15–24 and non-Hispanic/other women aged 25–34.[14] This underscores the fact that cervical cancer in adolescents and young women is not thought to be prevented by cytology screening. The reasons that screening appears ineffective in these age groups are not clear, but one possible explanation is that cervical precancer arising in adolescents transits to invasion so quickly and with such aggressive lesions that screening does not make a difference. As a result of these issues, and harm that can occur secondary to screening and aggressive management of CIN in adolescents and young women, a special advisory committee in England recently recommended that the first invitation to screening not be before age 24.5, with the target for screening to begin at age 25.[12]

Strong evidence showed that conization can be quite harmful secondary to risk of premature delivery and low birthweight babies.[15-18] The majority of studies on pregnancy outcomes following loop electrosurgical excision procedure (LEEP) have demonstrated a two- to three fold increase in adverse pregnancy outcomes.[15-18]

Adverse psychological sequelae as a result of cervical cancer screening, evaluation of abnormal cytology results, and treatment of CIN have been consistently reported,[19,20] including negative effects on sexual functioning.[21] Data from the ALTS trial show that a large number of women who receive LEEP do so unnecessarily since the lesions were either so small that they were biopsied off at the time of colposcopy or had regressed by the time women were scheduled for treatment.[22,23]More recent data indicate the likelihood that more than 50 percent of CIN 2/3 treated in women ages 20–24 would have spontaneously regressed by age 25 without treatment.[12]

Guidelines and Special Populations

Strong evidence now shows that HPV-induced cancers (including cervical, vulvar, vaginal, and anal) are more common in immunosuppressed individuals than in the general population.[24] Unfortunately, recurrence after treatment, despite highly active antiretroviral therapy, is extremely common, with few options for treatment except for repeat LEEP, resulting in increased risks for adverse events.

Other HPV Diseases and Guidelines

Genital warts are very common in adolescent and young women and men. Although it may be presumed that when treatment is successful, more rapid resolution of HPV lesions may shorten the period of transmissibility, treatment is nevertheless primarily aesthetic and based on psychological needs. Several options for treatment exist, including self-applied and provider-applied. Cognitive ability to understand treatment options along with personal choice should be explored when discussing treatment of genital warts with adolescents. It is important to note that the presence of genital warts does not change the natural history of CIN lesions. Hence, recommendations on when to begin screening and on screening interval do not change, nor should management of abnormal cytology results be altered in adolescents with genital warts.[3] Vulvar intraepithelial neoplasia (VIN) in adolescents is not uncommon, but vulvar cancer is virtually nonexistent. Although there are limited data on VIN in adolescents, anecdotal reports and one study support conservative followup or therapy for VIN, with topical wart therapies being commonly used, including trichoroacetic acid and imiquimod.

Challenges to Implementing Guidelines

The challenges to implementing the guidelines are huge. In a provider survey conducted by the CDC, 50 percent of providers were screening 18-year-old virgins and 80 percent were screening 18-year-olds who had initiated sex within the past month. When women were asked about cervical cancer screening, 60 percent of women who had initiated sex fewer than 3 years ago reported that they had had cervical cancer screening.[25,26] These data clearly show that guidelines for initiating screening are not well adhered to. Obstacles to adherence to guidelines include stakeholders such as industry, government, and healthcare systems. Healthcare provider obstacles include lack of awareness of guidelines, rejection of the evidence, impact of personal experiences, loss of pretext for health screening, concern that clinical-patient relations may be altered with extended interval screening, time constraints, guidelines don't apply to the provider's population, underestimation of harm secondary to screening too early, low esteem for guidelines, medical-legal ramifications if the cancer is missed, marketing, and economic benefits/threats. Important influences might include validation of success, positive peer pressure/educators, and financial. Negative reinforcements may include poor report cards, peer pressure, financial penalties, and sanctions. The barriers to adoption are multiple, but economics, tradition, and fear of change are dominant. Solutions require multiple-level interventions, including education, incentives, and penalties, as well as consumer education.

HPV Vaccination and Guidelines

The clinical trials data clearly demonstrate the high effectiveness of the vaccine in HPV-naïve women. However, the data clearly demonstrate that there is no prophylactic, therapeutic

benefit for women already infected with HPV vaccine types.[27] Women who were either HPV-positive by DNA testing or serology for the vaccine-targeted HPV types at baseline did not benefit from the vaccine. Consequently, guidelines to immunize should focus on pre-sexually active children and adolescents, thereby optimizing the impact of the vaccine from a public health perspective.[22,28] Unfortunately, the current Centers for Disease Control and Prevention (CDC) data show less than 35 percent of the target group has been vaccinated to date, and less than 25 percent have received the full schedule of three vaccinations.[29] By removing the most evident and threatening cytologic, colposcopic, and HPV testing results from cervical cancer prevention programs, vaccination will leave behind more equivocal and less predictive abnormalities and it will become increasingly expensive to find important lesions.[30] Hence, it will not be cost-effective to add HPV vaccination without eventually adjusting the rest of the cervical cancer prevention program. However, because current vaccine coverage is suboptimal, screening guidelines are unlikely to change in the foreseeable future since changes in screening would need to be directed toward the fully vaccinated, requiring different guidelines for different groups, an untenable situation.[31]

Additionally, documentation of vaccination will be difficult, and often impossible, given the lack of national vaccine registries. As an increasing proportion of the population becomes vaccinated, the incidence and prevalence of CIN 2/3 and adenocarcinoma in situ will decrease, resulting in an increase in the negative predictive value of present screening strategies, but a decrease in the positive predictive value.[30,32] These changes are independent of any changes occurring with the screening test itself and are purely due to the underlying prevalence of CIN 2+. As a result, if the screening intervals are not lengthened, or a more specific test is not used, the number of false positive results will increase and the number of false negative results will decrease.[33] Evidence-based modeling studies suggest that high vaccination rates would therefore promote starting screening later, screening less often, and moving toward screening with virologic tests that are more specific for risk.[33,34]

Conclusions

In summary, data do not support cervical screening of girls and young women under 21 years of age. Rates of cancer in this age group have not changed with the changes in screening age that have occurred over time. The current management guidelines for adolescents with abnormal cervical cytology were made to increase observation by repeat cytology rather than colposcopy and treatment of screen-detected CIN; therefore, the reason for screening anyone in this age group comes into question. Adolescent guidelines have been confusing and uptake slow because these guidelines are so diametrically different than recommendations for the management of abnormal cervical cytology in adult women. Consequently, the workshop members voted on these key messages:

1. Adolescent cervical cancer prevention programs should focus on prevention of HPV infection through universal HPV vaccination.
2. Screening should start at age 21 years. Screening of adolescents (age 20 and under) is potentially harmful because it can lead to unnecessary evaluation and treatment.

3. It is very important for adolescents to have access to family planning and to prevention of acquisition and harmful sequelae of sexually transmitted infections other than HPV.

The following were key research areas:

Cytology Guidelines

- Randomized trials for ASC, LSIL, and CIN 2 management are needed.
- Trials of atypical squamous cells, which cannot exclude high-grade squamous lesion (HSIL) (ASC-H), and atypical glandular cells (AGC) in adolescents are needed, as well as a randomized trial of HSIL management.

Natural History of HPV

- Additional epidemiology studies of CIN 2, CIN 2/3, and CIN 3 in adolescents are needed.
- Better biomarkers of progression of CIN 2 are needed.
- Studies of HPV 16/18 in triage of CIN 2 are needed. Should management be based on age of onset of intercourse rather than age?

Burdens & Challenges: Colposcopy, Cytology, and Histology in Adolescents

- Registries are needed to document changes in prevalence of lesions identified on colposcopy, cytology, and histology with increasing penetration of HPV vaccine(s) and to document changes in Pap test characteristics (sensitivity, specificity, positive predictive value, negative predictive value, etc.) with increasing penetration of HPV vaccine(s).
- Epidemiology of studies in AGC in adolescents are sorely needed. Additional biomarkers and other diagnostic tests are needed for screening.

Risks of Over-Management and Over-Treatment of Adolescents

- Should CIN 2/3 in adolescents be tested for HPV 16 and HPV 16+ lesions managed as CIN 3?
- What is the effect of cone height (or volume or tissue removed) on obstetrical outcome?
- Should CIN 2/3 treatment in adolescents be managed differently in “reliable” adolescents than “unreliable”?
- There is a need to determine who is “reliable.” Are there specific interventions that can reliably reduce outcome and procedure-related anxiety (across multiple populations)?

HPV-Associated Cancers and HIV

- There is a need for vaccine efficacy in HIV+, both prevention of initial and latent infections.
- There is a need for perinatal studies (longitudinal followup of children exposed to HPV at birth) and better treatment options.

Genital Warts and HPV-Induced VIN in Adolescents

- Is the natural history of external genital warts in adolescents different than in adults?
- What is the recurrence rate of disease in adolescents after treatment?
- What methods for the treatment of external genital warts are most successful and most acceptable for adolescents? What methods for the treatment of high-risk type external genital lesions (VIN) are most successful? Can these lesions be treated with the same methods used to treat low-risk HPV-type genital warts?

Implementation of Practice Guidelines: Barriers and Solutions

- Benchmark performance thresholds need to be established (i.e., mean and "upper limit" Pap intervals in adolescents and cervical treatment rates in adolescents and young women with abnormal Pap results).
- There is a need to track adoption of guidelines by individuals, provider groups, and health plans. Consumer-based research is needed regarding attitudes and practices in adoption of guidelines.

HPV Vaccination: Potential Impact on Screening

- What is an appropriate screening test and screening interval in vaccinated women?
- What is the best age to begin screening in vaccinated women?
- What percentage of adolescents has received all three shots? Two shots? One shot? How much protection does one or two dosages provide?

HPV Vaccination: Potential Impact on Screening

- Durability of responses—are boosters needed and what will be their coverage?
- How far "off schedule" is still effective?
- Will there be niche replacement and unmasking? If so, what are the disease implications? How much will cross-protection influence disease rates and screening and management?

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THOMAS C. WRIGHT, JR., M.D.

American Society for Colposcopy & Cervical Pathology

ASCCP Testimony on Cervical Cancer Screening, Guidelines for the Management of Abnormal Cervical Cytology Results and CIN/AIS, and Issues Pertaining to HPV and HPV Vaccination

ASCCP is a 3,200-member medical specialty society. The educational mission of the ASCCP is to improve clinician competence and performance and patient outcomes through educational activities focused around the study, prevention, diagnosis, and management of lower genital tract disorders. In 2001 and 2006, ASCCP convened consensus conferences of the 29 major medical organizations and Federal agencies to develop the national guidelines on the management of women with abnormal cervical cancer screening tests and the management of women with cervical intraepithelial neoplasia (CIN)/adenocarcinoma in situ.

ASCCP strongly recommends the National Institutes of Health consider the following research activities and priorities in the coming years:

1. Continuation of multidisciplinary national guidelines for management of abnormal cervical cytology
2. Federally funded large national clinical trial to evaluate different cervical cancer screening strategies

3. Federally funded evaluation of teaching tools to improve the adherence of practitioners to national guidelines for cervical cancer screening and the management of abnormal screening tests
4. Federally funded trial to address the concerns relating to the performance of colposcopy, especially in a real world setting and impact of additional biopsies on false positive and false negative rates
5. Studies to assess patient and provider perception of risk associated with delayed diagnosis of CIN 2+, obstetrical complications of treatment, and screening intervals
6. Studies to assess factors and biomarkers that predict the true premalignant potential of CIN 2
7. Federally funded large evaluation to determine risks of obstetrical complications associated with loop electrosurgical excision procedure as performed in the United States
8. Enhanced funding for surveillance to monitor the impact of HPV vaccination on specific HPV infections, cytological abnormalities, CIN 2+, and cancer. (The United States needs the capacity to monitor changes not only in disease prevalence, but also the potential for niche replacement by other high-risk types of HPV.)
9. Federally funded evaluation of the immunologic and other determinants of HPV clearance/persistence
10. Strategies devised to address disparities in cervical cancer rates among women from different ethnic, rural/urban, and socioeconomic groups

REBECCA ALLEN, M.D.

Association of Reproductive Health Professionals

The Association of Reproductive Health Professionals' Statement to the Office of Research on Women's Health and the National Institutes of Health

Good afternoon. My name is Dr. Rebecca Allen. I am a member of the Association of Reproductive Health Professionals (ARHP) and serve as Assistant Professor of Obstetrics and Gynecology at the Warren Alpert Medical School at Brown University. I also work here at Women and Infants' Hospital in the Division of Ambulatory Care. I am presenting comments on behalf of ARHP.

ARHP was founded in 1963 and is a multidisciplinary professional association with more than 12,000 reproductive health professional members who provide direct services, conduct reproductive research, and influence public policy. ARHP is offering comments today because we value evidence-based science and serve as a trusted resource for reproductive and sexual health education and information. We meet our educational mission through a variety of educational programs, meetings, publications, and Web-based activities. Through professional education, ARHP helps translate cutting-edge science for reproductive healthcare providers to improve patient care.

On behalf of ARHP and its members, I thank the Office of Research on Women's Health (ORWH) and the National Institutes of Health (NIH) for holding these meetings on new dimensions and strategies for women's health research, and for the opportunity to offer comments this afternoon. ARHP would like to take this opportunity to focus on several key issues that present opportunities for the ORWH and NIH:

1. Identifying research gaps that need immediate attention
2. Translating evidence-based science into continuing education for healthcare providers to improve clinical practices and patient care with Federal funding support
3. Promoting regular cross-agency and intradepartmental collaboration on reproductive and sexual health topics to develop innovative strategies

Of the many key aspects of reproductive and sexual health, these two are of particular importance:

1. The effective translation of the latest clinical recommendations into the best clinical practice
2. The development of additional safe and effective forms of long-acting reversible contraception, or LARC
3. For efficiency and potential impact, more research is needed on effective translation of reproductive health-related science into practice. Unless research findings are converted into practice change, the intention of conducting research to inform clinical practice and patient care is lost. To truly improve patient care, it is important to identify professional education platforms that work. This can be accomplished through the development of comprehensive evidence-based guidelines, well-designed continuing education and training programs, and tools to evaluate their implementation.

For the development of innovative strategies and solutions, cross-agency and intra-departmental collaboration should be encouraged in order to develop better and more innovative strategies. Currently, different health topics are housed in different agencies or departments, and collaboration seems very challenging. This means, for example, that logically linked topics such as maternal and child health and reproductive health are studied independently by separate agencies or departments. By including a focus on maternal child health in a discussion of reproductive health, for example, important life-saving, health-promoting aspects of family planning emerge to improve maternal child health. By working within and across departments and agencies, redundancies can be reduced, efficiency improved, and costs cut.

As the Obama administration investigates ways to reduce abortion and unintended pregnancy rates, the Centers for Disease Control and Prevention (CDC) and NIH have collaborated on issues related to preterm birth and unintended pregnancy. The discussion and research occurring between these two agencies has the potential to make a dramatic impact on both preterm birth and unintended pregnancy rates. Further cooperation and communication between departments and agencies can only enhance and strengthen programs already proven to work.

The work currently being done around preterm birth highlights the need not only for continuing education to implement practice change, but also the need for Federal funding to be available to ensure evidence-based scientific findings are incorporated into clinical practice. Unlike the many mechanisms now in place to support scientific research, there is no federally funded system designed to fund the translation of that research into practice. Now is the time to establish clear Federal funding mechanisms for the development of continuing education and health professions training curricula in reproductive health. This is a "fast track" solution to reducing health disparities and improving patient care.

For the sexual and reproductive health field, this would mean addressing the linked issues of contraception, sexuality, abortion, human immunodeficiency virus and sexually transmitted infections, pregnancy, and maternal and child health, as well as increasing provider knowledge, skills, and understanding of these areas. Through adequate education and training of all clinicians, evidence-based, comprehensive sexual and reproductive health care can be brought directly to the patients, which is the primary goal of conducting meaningful research.

Recently, the National Institutes of Health and industry research have moved away from developing female contraceptive methods to a new focus on developing contraceptives for men. This research is important and should continue, but NIH should also maintain a focus on researching new safe, effective contraceptive methods for women, especially new LARC methods. ARHP advocates for the availability of as many safe and effective contraceptive methods as possible to meet the wide variety of needs of American women and men.

ARHP is encouraged by NIH's collaborative work with the CDC and hopes that cross-agency and intradepartmental collaboration continues to develop in order to improve efficiency, reduce redundancies, and cut costs. An investment of Federal funding to develop and expand sexual and reproductive health continuing education for all providers throughout their careers would aid in the achievement of these goals.

MIMI POMERLEAU, DNP, WHNP-BC, RNC-OB

Association of Women's Health, Obstetric, and Neonatal Nurses
Future Research Direction: Preterm Birth

Introduction

Good afternoon. I am Dr. Mimi Pomerleau, an advanced practice nurse. Thank you for the opportunity to provide testimony. I am here today on behalf of the 23,000 members of the Association of Women's Health, Obstetric, and Neonatal Nurses, also known as AWHONN. AWHONN is a nonprofit membership organization committed to promoting the health of women and newborns. We applaud your efforts to ensure that future women's health research anticipates new dimensions of health and incorporates innovative and successful strategies.

Nurses are typically the first and most consistent point of contact in the healthcare setting. Evidence suggests that nurses spend more time with patients—up to four times on average—than any other healthcare provider. As a result, we have a unique perspective on the

healthcare system—on the way care is and the way care should be provided to women; and we are ideally positioned to conduct research and translate it into innovative, evidence-based care practices.

AWHONN produces a number of resources, publications, Webinars, and educational offerings that are evidence-based and available for nurses to use in their everyday practice. AWHONN also promotes nurse-led research through its two journals, the *Journal of Obstetric, Gynecologic, and Neonatal Nursing* and *Nursing for Women's Health*. Additionally, the organization acknowledges, each year at its annual convention, its most distinguished writers and researchers.

Personally, as a doctorally prepared nurse, I am an educator, researcher, and clinician. In my clinical practice as a staff nurse and nurse practitioner on a postpartum unit, I care for women and newborns and I am often challenged to find the research to support common nursing care practices. As a nursing educator, I encourage students to examine and evaluate these practices to provide optimal care to childbearing families. AWHONN is resource for students and experienced nurses.

Late Preterm Infant Initiative

AWHONN is known as a leader among nursing organizations for its work to promote evidence-based practice. As an example of this leadership, AWHONN periodically conducts research-based practice projects that are designed to evaluate AWHONN evidence-based protocols and ultimately to facilitate the translation of research into clinical nursing practice. AWHONN's Research Advisory Panel and other clinically focused advisory panels recommend topics appropriate for development as research-based practice projects. From there, nurse experts are identified to form a project Science Team. Each Science Team completes a systematic and comprehensive review of literature on the identified topic and develops a protocol. This evidence-based clinical protocol is then implemented in multiple clinical sites. Data are gathered and evaluated during the project term and disseminated via published outcomes articles and a final refined evidence-based clinical practice guideline. An ongoing Research-Based Practice Project that relates to women's health and the priorities that will be discussed at this meeting is our Late Preterm Infant Initiative, or the LPI Initiative.

In the United States, nearly 13 percent of all of babies are born preterm. Premature babies are at risk for a number of complications immediately following birth, such as respiratory distress, infections, and even death. These vulnerable newborns often require highly specialized and costly care. Premature babies are also at risk of experiencing long-term complications, including potentially lifelong debilitating physical and developmental disabilities. Again, these complications can be costly and potentially life threatening.

Premature infants can be subdivided by gestational age into categories. One category, known as late preterm infants, comprises infants born between 34 and 36 completed weeks of gestation. More than 70 percent of preterm births occur in this gestational age category. These infants often look and act like full term infants and are usually larger than very premature newborns. However, late preterm infants have many of the same physiologic vulnerabilities and unique health considerations as smaller preterm babies, such as increased risk for respiratory

distress, immature suck and swallow reflexes that can impair feeding efforts, and jaundice, which if not aggressively treated, can result in significant and irreversible neonatal morbidity.

AWHONN is among the first professional organizations to recognize the importance of increasing awareness of late preterm infants' special needs. As such, AWHONN launched its Late Preterm Infant Initiative in 2005 as a multiyear education and awareness project focused on issues related to nursing care of this special population of newborns. The AWHONN Late Preterm Research-Based Practice Project (known as the late preterm RBP) is currently a major focus of the Initiative. This project is a multiyear descriptive research study launched in late 2007 and is aimed at increasing our understanding of the special needs of late preterm newborns and their risks for complications. Additional study objectives include evaluating change in nurses' knowledge about late preterm birth and how implementation of AWHONN's evidence-based project guideline changes their assessment and care of late preterm newborns. A knowledge perception survey will also be administered to consenting mothers to assess their knowledge of the special needs of their late preterm newborns. The project will be implemented in 15 hospitals in the United States and in Canada. We look forward to completing the project and disseminating results in 2010.

The causes for preterm labor and birth are complex and not fully understood. Some general health and pregnancy-related issues (e.g., multiples, infection, and high blood pressure) and lifestyle choices (e.g., smoking, lack of prenatal care) are known to be risk factors for preterm birth. And women who have had one preterm baby are at a significantly high risk of having a subsequent preterm birth. However, any pregnant woman can be affected; and it is estimated that approximately half of all preterm births occur in women who have no clearly identifiable risk factors. It is disturbing to note that according to the 2008 National Vital Statistics Report, the rate of premature birth has increased in the United States by 36 percent since the early 1980s. Despite many best efforts by nurses, physicians, and other perinatal researchers alike, we have not been able to stem the tide of this critical healthcare problem.

Future Research Priorities

It is critical that the National Institutes of Health prioritize the issue of prematurity, with a special focus on late preterm birth in future years. We need more information on what causes preterm birth, how it might be prevented, and how to best care for preterm infants to reduce morbidity and mortality.

For example, recent research suggests that successful initiation of breastfeeding is significant to the health of preterm infants because it is now documented that providing mother's breast milk to these babies can help decrease infant morbidity and mortality risk. In addition, the provision of breast milk to these infants not only has nutritional benefit, but also has therapeutic immunologic support benefits that reduce the risk of diseases common among preterm newborns, such as necrotizing enterocolitis and sepsis. Research has shown that these vulnerable newborns are usually physiologically more stable during the act of breastfeeding compared to infants feeding from a bottle or other source. Providing the preterm newborn with mother's milk can also enhance maternal-infant attachment and provides the mother an opportunity to play an active role in her preterm newborn's care.

Further investigation of this low-cost, potentially high-impact intervention is exactly the type of research that should be expanded moving forward. Another example of such research relates to a method of holding a baby, called kangaroo care. Kangaroo care involves skin-to-skin contact; the parent holds the baby, in just a diaper, against her bare chest. Research demonstrates that there are significant benefits for preterm infants who are held this way for several hours each day, including improved breathing, stabilization of the baby's heart rate and temperature, more rapid weight gain, and earlier hospital discharge. Nurses are leading much of the current research related to kangaroo care, exploring additional benefits for both the parent and the infant. In addition, nurses are often the healthcare provider implementing this practice in the hospital setting and educating new parents on the value of kangaroo care.

Nurses and other pregnancy care providers must have access to the latest science and information available in the care of women and infants. Nurses, who are already doing research in this field, are well-suited to implement new findings, pose innovative research questions, and help combat this serious problem for women and their families.

DEBORAH N. PEARLMAN, PH.D.

Brown University

Testimony of Deborah N. Pearlman

This year, almost half a million women in the United States will die of cardiovascular diseases. While cardiovascular diseases are the number one killer of American women, only 13 percent of women in the United States see heart disease as the greatest threat to their health. Even more surprising, fewer than one in five physicians know that more women than men die of heart disease each year—and only 8 percent of primary care physicians are aware of this fact. Cardiovascular gender differences are apparent long before a cardiovascular disease event is diagnosed in women and men. Improved understanding of the biology underlying these differences has the potential to advance the diagnosis and treatment of cardiovascular diseases in women.[1]

Other areas of research needed in the area of women's health/cardiovascular diseases include the following:

- Are there significant gender, racial/ethnic, and socioeconomic (SES) differences in the patterns of health and illness that may affect the diagnosis, treatment, and survival of women who experience a cardiovascular disease event?
- Are there significant gender, racial/ethnic, and SES differences in the use of health services that may affect the diagnosis, treatment, and survival of women who experience a cardiovascular disease event?
- How can care and treatments developed for women improve their health outcomes after a cardiovascular disease event?
- How do economic resources and other determinants affect women's health, especially in relation to the prevention of cardiovascular diseases?

- How can a multilevel framework, one that focuses on individual-level risk factors, family factors, and the broader social context in which women live advance epidemiologic research on disparities in primary and secondary prevention of cardiovascular diseases?
- What are the evidence-based programs and policies that have been shown to positively impact women's active involvement in reducing metabolic risk factors (e.g., increased blood pressure, and cholesterol and glucose concentrations) and lifestyle risk factors (e.g., smoking, poor diet, physical inactivity, adiposity) shown to increase the risk of developing and dying from cardiovascular diseases?

Reference

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MICHELLE CORTES-HARKINS

Center for Hispanic Policy & Advocacy

Center for Hispanic Policy & Advocacy's NIH Testimony

The Center for Hispanic Policy & Advocacy (CHisPA) is pleased to submit written testimony to help inform future women's health priorities at the National Institutes for Health (NIH). CHisPA is a bilingual, Latino community-based, nonprofit organization located in Providence, Rhode Island, dedicated to improving the quality of life for Latinos by providing a variety of programs and services. CHisPA's goal is to empower Latino families and individuals to achieve their full potential as productive members of the Rhode Island community. CHisPA houses the Promotores de Salud/Health Promoters program—a community-based health literacy/outreach program that provides culturally appropriate and accessible health education and information.

A majority of our clients are Latinas (70 percent) and intersect with the agency through programs on cardiovascular disease, reproductive health, and domestic violence. Pulling from our experience in working with the Latino community in Providence and because the Latino population has been disproportionately affected by the obesity epidemic, we have primarily focused on this health disparity. Research and our own data show that factors also contributing to the high rates of obesity and overweight among Latinos include poor diets affected by acculturation, sedentary lifestyles, and low socioeconomic status.

The Promotores de Salud/Health Promoters have been coordinating the Latino Health Promotion Center with funding from the Rhode Island Office of Minority Health since 2004. Promotores receive intensive training in community and health outreach. Promotores de Salud conduct outreach in the community and provide vital health information on topics such as cancer, heart disease, diabetes, HIV/AIDS prevention, the HIV Vaccine Communication Campaign, nutrition, and access to basic health care. This model empowers natural leaders in the Rhode Island Latina community with the resources and knowledge of where to go and what to do for health services. In turn, Promotores help others access needed health services and educate the community on important health issues. In doing so, the lay health promoters facilitate the

health and wellness of the entire Latino community. Potential lay health promoters are carefully recruited to participate in the program. The program consists of 1-day training and other sessions on specific health topics. It has two major components: knowledge and skills. The knowledge component focuses on health topics and behaviors that have been identified as relevant by our Latina clients. The skills component focuses on skills necessary to carry out the outreach activities such as communication skills, problem solving, etc. Each promoter has a resource manual filled with information regarding services and health topics. Currently, CHisPA's Promotores are providing education and prevention on cardiovascular disease, nutrition, and domestic violence. According to demographics collected by CHisPA during the previous years of program implementation (July–June 2008), Promotores de Salud achieved the following:

- Two hundred educational workshops in Spanish on various health topics were presented and attended by approximately 1,786 Latino individuals. All participants showed an increase in their knowledge about the topic presented, as measured by the pre/post tests developed for each topic.
- Three hundred and ninety individuals completed the training Salud Para su Corazon/ Health for your Heart.
- One thousand one hundred and five referrals for free screenings and other healthcare services were made. Some of these services were provided onsite at CHisPA by collaborating with community agencies such as The Family Van and Lifespan Community Health Services.
- One hundred twenty-seven community events were covered and allowed Promotores de Salud/Health Promoters to have direct contact with approximately 3,261 individuals; approximately 21,895 pieces of educational material in Spanish were distributed.
- Four CHisPA Annual Health Fairs were organized, reaching 468 individuals.

From our experience within the Latino community, and more specifically around the area of women's health, CHisPA is making the following recommendations:

Health Literacy

Literacy levels, in addition to language, must be addressed. As defined by Healthy People 2010, health literacy is the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions. Latin-American immigrants from rural areas may not have had opportunities for basic education and consequently have low literacy levels in their primary language. From the Harvard School of Public Health, we know that, nationally, 56 percent of Latinos residing in the United States are functionally or marginally illiterate. Their information needs must be met with different media that address low-literacy levels, such as radio and television. Other areas we have found where this is critical is in health brochures, care instructions, and even one-on-one interaction with healthcare providers. Limited English language and literacy skills can have a significant impact on one's health. CHisPA believes that additional NIH research in the area of health literacy to develop science-based approaches will greatly benefit and impact the disparities now seen in health outcomes among Latinas. From our experience, we know

that literacy affects how health services are utilized, particularly around prevention, and in how self-care instructions are carried out.

Culturally Appropriate Practices

When treating a Latina patient, the level of acculturation needs to be assessed and the treatment adjusted accordingly. For non-English-speaking persons, bicultural or bilingual staff like the Promotores de Salud and/or medical translators are necessary. Determining the individual's primary language is a first step in this direction. As the Center for Hispanic Policy & Advocacy's experience has shown, it is not enough to merely translate the messages on prevention and treatment, but the Latina population needs and desires a community-based model. An additional layer is that within the Latina community, the country of origin influences the approaches to be used. In the Northeast, there is a heavy concentration of Latinos from the Caribbean who have different cultural and language needs than Latinos from the Central and South American countries. Also, Latinas who are born in the United States versus those who are born outside the country increases cultural variability and affects health behaviors. A unique characteristic of the Latino community is the importance of acquiring information through word-of-mouth. Our experience has shown that Latinas will share information they have learned about healthy behaviors, prevention, and care with friends in their neighborhood, friends in other cities, friends in their country of birth, relatives in their country of birth, or people at work.

Research Practices

Effective and meaningful research to address minority health disparities lies in the ability for research organizations to link to and work with community-based organizations such as CHisPA. This approach not only empowers the Latino community, but also allows for accurate input. Our experience has shown that a majority of research is conducted in English, but the materials used to capture information are not translated. In action, this allows limited access to Latino views and experiences. In addition, it is important for the Latina community to understand why and how research is being conducted and to get a better understanding of why it is important to be counted in studies on issues affecting their lives. More of a buy-in provides opportunities for research and interventions to become sustainable community change. Recruitment for studies also involves having a level of trust that an organization such as CHisPA has already established. Barriers such as language, immigration status, and distrust of mainstream institutions can affect recruitment for newly arrived immigrants and even those already settled in the United States for a number of years.

As an organization that primarily works with Latinas, CHisPA believes that participatory research efforts through the NIH would allow for a collaborative and symbiotic relationship of trust to be developed. This approach would also allow for the validation and examination of everyday practices that have been effective, but perhaps not studied within Latino-population-serving, community-based organizations. Oftentimes, perceptions of areas to research may not be in sync with what is considered relevant to Latinas and their specific health needs. We also believe that once a study is completed, an open forum within the community to discuss findings brings a sense of balance to the process and allows for future studies to be received more openly.

DIXIE MILLS, M.D.

Dr. Susan Love Research Foundation/Army of Women

The Love/Avon Army of Women: A Paradigm-Changing Research Resource—A New Breast Cancer Initiative Creates Partnership Between Scientists and Women

We are honored to have been asked to submit testimony regarding new strategies and direction for the Office of Research on Women's Health (ORWH). We would like to describe our exciting national initiative, its successes to date, and future goals. Being an innovative research project, the Love/Avon Army of Women (AOW) would seem to fit perfectly into the scope of the ORWH's research agenda for the coming decade. We would like to share how this novel program can easily enhance research projects' recruitment efforts and accelerate discovery of the cause and prevention of breast cancer and other women's health issues. The Dr. Susan Love Research Foundation and the Avon Foundation for Women, a global leader in breast cancer research, have joined forces to launch a revolutionary new program: the Love/Avon Army of Women. This groundbreaking initiative is designed to accelerate breast cancer research by providing a 21st Century model of a "just in time" online resource of volunteers that will allow scientists to recruit women for research studies aimed at finding the cause of breast cancer and ways to prevent it. It also allows collaboration among scientists accessing the data, asking new questions, and then sharing it back with the research participants.

"Women have repeatedly demonstrated through their fundraising and advocacy their dedication to ending this disease," said Dr. Susan Love, one of the founding mothers of the breast cancer advocacy movement. "This new initiative gives women the opportunity to take the next steps and be part of the research itself." Dr. Love, a renowned breast cancer surgeon and respected expert in the field, is also the author of the best-selling *Dr. Susan Love's Breast Book* and the president of the Dr. Susan Love Research Foundation.

"Avon is itself an 'army of women,' and we are committed to being the company and the foundation for women," explained Andrea Jung, Chairman and Chief Executive Officer of Avon Products, Inc. "The Army of Women is a perfect marriage of our global leadership in the breast cancer cause and our grassroots access to women across the country."

The Army of Women intends to recruit 1 million women—healthy women who have never had cancer, high-risk women, and breast cancer survivors—who are interested in partnering with scientists by taking part in research studies. The AOW is not a clinical trials matching service, nor is it a tissue bank. And it does not provide funding. It was developed with the sole intent of promoting research studies utilizing women to research the etiology, causes, and prevention of breast cancer by providing scientists a vehicle to access volunteers they need.

Women who are interested register on the Army of Women Web site, http://www.armyofwomen.org, providing year of birth, Zip code, and ethnicity. Launched in October 2008 on national media, the Army of Women now has more than 305,000 members, the majority of whom do not have personal experience with the disease but have the desire to participate in research to discover its causes. Women from around the world and from every State in the United States have joined. Of these women, 85 percent are Caucasian and ages range

from 18 to 99 years with a mean age of 56. We have started efforts to increase our minority membership.

Research scientists register with the Army of Women online at http://www.armyofwomen.org for the opportunity to submit project proposals to recruit volunteers for their studies. Studies are reviewed by a Scientific Advisory Committee and are held to the highest ethical standards before being released to the Army of Women. All studies have institutional review-board approval before being sent out to AOW members.

After a research proposal has been accepted, the Army of Women sends out an e-mail notice to all Army volunteers that describes the study, eligibility, and what participation will involve. Women self-select the studies that interest them and for which they are eligible. They can also forward the e-mail to someone else they think might be eligible. Army of Women staff coordinate the tissue collection process with either the scientist or an Army of Women collection center where volunteers can go to give a blood, urine, breast fluid, or breast tissue sample. Researchers can also use the Army of Women for epidemiology studies or recruitment for prevention research. To date, 14 studies, approximately 2 a month, have been sent out via e-mail: 6 are now closed and 8 are still open. The first study sent out in October 2008 to recruit women for the Sister Study, a large national effort, was able to recruit nearly 4,000 qualified women in 2 weeks and to successfully close the study, which began in 2003. “The Army of Women is an important step in empowering women to participate in research and ensure that study results apply to all women. The Sister Study is thrilled to be included in the Love/Avon Army of Women!” said Dr. Dale Sandler, of the National Institute of Environmental Health Sciences of the National Institutes of Health. Studies sent out have recruited more women than the researchers had anticipated and in a much shorter time. To date, nearly 12,000 women are now or have participated in the clinical research process.

AOW members can also apply to participate in our “foot soldier” program and act as spokespeople at local events to raise awareness about the Army of Women and research efforts.

Beginning in October 2009, to celebrate the first anniversary of the Army of Women, efforts were underway to launch a large longitudinal cohort study of AOW members, to be called the Health of Women or HOW Study. The study is being conducted in collaboration with the NCI’s caBIG (Cancer Biomedical Informatics Grid) and the City of Hope’s epidemiology team of Drs. Leslie Bernstein and Katherine Henderson. Online surveys will be sent to AOW members every 3 to 4 months for the next several years. We see this as the largest cohort study to date that will be done totally online and the results shared with other qualified researchers. Our goal is to have 1 million women and because we are doing it online, we should be able to be fairly nimble about what we can do and what questions we can ask. We hope to demonstrate a new 21st Century model of research that is empowering to consumers and that is technology enabled. Utilizing Web technology, we can facilitate women signing up and responding to secure online questionnaires and then facilitate authorized researchers to access this information. The Web-based software will allow the infrastructure to be immensely dynamic, cost efficient, and time sensitive. We see this specific platform eventually having the capacity to look at other forms of cancer or other diseases.

Breast cancer research at this time is concentrated primarily on improving imaging devices that can detect tumors early, developing drugs to kill cancer cells, and understanding why cancer cells become resistant to existing drugs. The Army of Women will encourage researchers to shift their focus from developing new treatments to understanding what causes normal human cells to become cancer cells in the first place. In addition, by providing scientists with the healthy women they need, but often have difficulty finding, the Army of Women will make it possible for them to shift their focus from the lab, where much of the molecular work is currently being conducted on mice or in cell culture, to real women.

Scientists throughout the United States have already expressed their interest in partnering with the Army of Women. "The Army of Women is going to revolutionize the way biologists do research," said Dr. Thea Tlsty, a pathologist and cancer researcher at the University of California, San Francisco. "I'm eager to submit a proposal and to begin doing work with Army of Women volunteers."

We are currently looking for more scientists who have projects needing human breast tissue, ductal fluid, urine, saliva, or blood as well as data for epidemiology. Army of Women Collection Centers for tissue specimens have been set up in various geographic areas if researchers are not able to collect specimens themselves or desire faster accrual.

The National Breast Cancer Coalition, a grassroots advocacy organization, and the American Association of Cancer Research, a scientific organization focused on high-quality, innovative cancer research, have agreed to partner with the Army of Women in directing and supporting this initiative. The organizations will represent the concerns of scientists and advocates as well as help in their recruitment.

We again thank you for this opportunity to better explain our program. We are confident that its success can translate to other disciplines in the future and can become the mainstay of recruitment and collaboration for clinical research.

To find out more about the Love/Avon Army of Women, please visit http://www.armyofwomen.org.

PATRICIA PALUZZI, DR.P.H., CNM

Healthy Teen Network

Future Research on Adolescent Sexuality and Parenting

Healthy Teen Network is the only national nonprofit organization focused on both preventing teen pregnancy and supporting pregnant and parenting teens. Our work began 30 years ago when teen pregnancy was first recognized as a public health issue that impacts the well-being of the mother, father, and child, as well as the financial stability and future of communities.

Senator Edward Kennedy introduced the first legislation to support the education of pregnant and parenting teens in 1976. While this legislation did not pass, it started the conversation on how best to ensure that pregnant and parenting teens receive the education they need to gain employment and break the cycle of poverty they are so often prone to. For the subsequent decade or so, through Title IX and other avenues, supports for pregnant and parenting teens were pursued in many communities and schools.

The tide changed quickly, however, with the advent of newer and more contraceptive methods and sexuality education. These two advances are credited, in part, with the ever-decreasing rate of teen births seen in the United States between the 1970s and 2005. While not enough good can be said about these advances, the pregnant and parenting teen soon became a persona non grata in the United States, resulting in essentially no advances in science or proven effective interventions for this population. And as more recent data have shown, education and contraception are essential, but not sufficient, in preventing teen pregnancies, as rates have climbed since 2005.

There are some known and many yet-to-be proven reasons for both the increase in teen pregnancy and the lack of support for pregnant and parenting teens. The research agenda I am about to offer for the National Institutes of Health (NIH) to consider builds on both what we do know and what we have yet to learn.

1. Access is a multifaceted concept that plays a large role in both availability and use of education and services that support teen pregnancy prevention. Research questions to consider follow:
    a. How can we separate emotional responses from professional duty to improve providers' willingness to offer appropriate education and services regarding teen sexual health?
    b. How do we reframe teen pregnancy prevention as a public health issue that impacts the well-being of our communities—and future—so that we gain more widespread support?
    c. What do youth say about accessing education and services?
    d. Why do they not access these services even if they are available and confidential?
2. Teen pregnancy prevention is a complex issue impacted by race/ethnicity, socioeconomic status, family, and community, as well as societal regard for and treatment of youth, especially marginalized youth. Research questions to consider follow:
    a. Can the various levels of influence on teen sexuality and reproductive decisions be quantified?
    b. How can what we have learned about brain development be translated into interventions?
    c. How can the effects of racism and classism be measured and quantified so that interventions can be developed?

d. How can cultural beliefs be addressed positively within teen pregnancy prevention strategies?

e. What approaches work best for connecting youth with caring adults and/or community?

3. Pregnant and parenting teens are a vilified population in the United States, resulting in a dearth of research and effective interventions. Research questions to consider follow:

   a. What frame works best to gain support for pregnant and parenting teens?

   b. What are the essential program components for pregnant and parenting teens that promote educational gains, livable wage employment, effective parenting, and healthy relationships?

   c. What policies currently in place help or hinder positive outcomes for teen parents and their children?

I recognize that many of these questions may be "soft" and not the type of research that NIH excels in. However, mixed methodologies are needed to shed more light on how we can support all youth in delaying parenting or attaining successful adult lives when faced with early parenting. Perhaps NIH will consider partnering with other agencies to explore some of this much-needed research so youth can be more effectively served.

ALESSANDRA RELLINI, PH.D.

International Society for the Study of Women's Sexual Health
Focus on Female Sexual Health

As far back as the 1950s, one of the country's most recognized sexologists, Alfred Kinsey, argued for the need for government-sponsored studies on human sexuality. He pointed out the absurdity that we had more knowledge about the sexual behavior of insects than we had about sexuality in humans. Fast forward more than 50 years and we can claim better understanding of male erection and ejaculation. Unfortunately, we cannot say the same for female sexuality. We have mapped almost all neurotransmitters in the peripheral and the central nervous system pathways involved with erection. We have effective pharmacological and behavioral treatments for erectile dysfunction and for premature ejaculation. But we are very far from understanding even the basic mechanisms involved in female sexuality, including sexual desire, arousal, and satisfaction. What we have been able to solidly establish in the past two decades is that we cannot assume that the mechanisms behind the sexuality of women are the same as those for men. This information does not help us much in the clinic when we are treating women with sexual dysfunctions. It is unreasonable to expect to be able to improve the sexual health of women if we are not willing, as a society, to invest our time and resources in this topic. At the last Consultation Meeting for the International Urology Association (July 2009), experts provided a bleak review of the evidence available for treatment of female sexual dysfunction. We still do not have empirically validated treatments for any of the female sexual dysfunctions, except for primary anorgasmia, a relatively rare condition

experienced by young adult women who need to become more comfortable and knowledgeable of their bodies. The lack of advancement in this topic is not surprising given that, in the past three decades, only a handful of clinically controlled trials have been conducted on female sexual dysfunction and all of them were underpowered because of the lack of sufficient funding. Perhaps a lack of interest in female sexuality would be okay in a society that endorsed the belief that sex is not an important aspect of women's lives, but we are not that society, or at least, we are no longer that society. Sexual satisfaction, sexual function, and sexual behavior are a common theme of conversation; female sexuality is part of most movies, shows, and magazines; and it is on the cover page of most magazines that target women's health. In this testimony, I will present three main reasons why focusing on female sexuality should be put on the cover page of the National Institutes of Health (NIH) research agenda:

1. Research on female sexual function and satisfaction can improve patients' compliance for treatments that have sexual side effects.
2. We need to move toward the development of treatments that improve quality of life and not simply reduce symptoms, and in this case I am referring to sexual quality of life, which the World Health Organization (WHO) considers a basic human right.
3. A more comprehensive understanding of sexual behaviors can lead to more effective prevention programs for human immunodeficiency (HIV)/acquired immune deficiency syndrome (AIDS) infection and transmission.

Treatment Compliance

Our patients keep telling us with their actions that treatment efficacy is not sufficient for them to maintain compliance with our treatment recommendations. Every day, physicians are pressured to choose a less effective intervention due to patients refusing to take medications with side effects. This is particularly true for antidepressants and their sexual side effects. The WHO collaboration center for international drug monitoring has reported that out of nearly 215,000 reported adverse effects of antidepressant medications during the period 1968 to 1997, 5,000 were sexual in nature.[1] Of 258 individuals utilizing antidepressants, 33 percent discontinued the medication because of side effects, and sexual difficulties were ranked second on the list of these side effects.[2] Furthermore, a reduction in sexual desire is one of the most commonly reported reasons for the discontinuation of oral contraceptives in young women who are at high risk for unwanted pregnancy. Efficacy of treatments has been the focus of our research endeavors for years, but efficacy alone is futile if the treatment is undermined by lack of compliance.

We need to monitor side effects of treatments, and we need ancillary interventions for the prevention and the improvement of side effects to reduce treatment discontinuation. Specific efforts in developing ancillary treatments that focus on side effects reduction (including sexual side effects) need to be developed, tested, and finally integrated in our clinics and hospitals. Only in this way will we be able to have a more holistic approach to the treatment of the individual and this will lead to a greater effectiveness of our medicine.

Quality of Life

The first goal of the Healthy People 2010 initiative is to increase the quality and the number of healthy years, suggesting that, as a society, we are starting to look at science and medicine for ways to improve not only the years we live, but the quality of these years. Our research efforts in the past century have allowed us to make incredible strides in the reduction of symptoms and the increase in life expectancy. Because of advancements in treatments of illnesses and disorders that would previously have led to certain death, women with breast and gynecological cancer are now able to live longer. Improvements in the detection and prevention of heart attacks allow more women to live longer, and improvements in gynecological care have significantly reduced the mortality associated with giving birth. Improvements in the prevention and treatment of illnesses/disorders certainly require continuous attention, but we agree with the goals set by Healthy People 2010 that a longer life is not enough—we now need to focus on the quality of the life women lead, and sexual satisfaction is an essential aspect of quality of life. Indeed, sexual activities are listed as part of one of the five domains of quality of life identified by the WHO Quality of Life assessment.[3] Despite the undeniable importance of sex in people's lives, the main thrust of government-supported research for the past 8 years has focused almost exclusively on HIV/AIDS infection and transmission. Messages that sex is dangerous and needs to be avoided and that sex should be a behavior confined to the goal of procreation are not in synchrony with the way in which our society sees and values sexuality. For the past 8 years, I have worked to help survivors of sexual abuse to regain a satisfying sexual life. In my brief career, I have completed clinical interviews with more than 300 women with a history of sexual abuse and at the end of each interview, I have invited them to share their personal views of their own sexuality and the importance they place on reclaiming healthy sexual function robbed from them by their trauma history. Some of my patients tell me that they have eliminated sex from their minds and they are too scared to even consider trying to repair this aspect of their lives that is now dead to them. However, for many women, sex is not dead and it is not only a means to have a child with their partner. These women would jump at the opportunity to have a satisfying intimate relationship with a loving partner and they feel high levels of distress because they are unable to perform what is considered a normal human function. They see themselves as damaged goods because they cannot feel and experience something that is part of a normal sexual response. These women are tired of the frustration that their impaired sexuality brings into their relationships and they fear that soon their partners will leave them because they are not "normal women."

One woman who was suffering from severe post-traumatic stress disorder symptoms and night panic attacks looked at me in disbelief when I asked her whether her sexual problems were a priority, considering her other symptoms. She explained to me that if she could have her sexuality back, she would feel like a complete woman again and could find the motivation to fight to get the other symptoms under control, but as things were right now, she had nothing to look forward to, even if the post-traumatic stress disorder symptoms were gone. This woman's response is not different from what the literature tells us about cancer survivors.

In the first year after treatment for breast cancer, women are mostly concerned about their survival, and even if provided with information on techniques to prevent later sexual

dysfunction caused by the treatment, they often do not utilize these resources. However, as little as 1 year post-treatment, when they are no longer as worried about just survival, women are more interested in improving the quality of their lives and seek resources. We owe these women, and all women, to improve our knowledge for the treatment and management of female sexual dysfunction and ensure dissemination of this information to trained gynecologists and other professionals who provide health care to women. Indeed, a secondary problem for the treatment of female sexual dysfunctions is the lack of trained health professionals who take on the responsibility of asking women about their sexual health. While urologists have been providing support to men with sexual health for decades, women do not have the same availability of professional help. Thus, female sexual health is a topic that has long been ignored not only by basic science, but also in clinical practice.

Our goal to reduce disparities in health between men and women should seriously consider how to narrow the gap in the lack of sexual health care for women. If we do not provide evidence-based treatment options, women will seek remedies on their own and may put themselves at risk for other health problems and sexual problems by trying risky off-label treatments. We are already seeing the market for "sexual remedies" providing alternatives such as plastic surgery to the genitalia, something that could lead to serious health problems for women. Because of the lack of solid research on even the basics of female anatomy, women have often been seeking these surgeries at a great cost both financially and emotionally, and despite the complete lack of scientific evidence for efficacy of any measure of satisfaction and function.

A More Comprehensive View of Sexual Behaviors

It is ironic that research on sexuality has been underrepresented for the past several decades while sex is one of the strongest motivators for human behavior. Indeed, the motivation is so strong that many individuals put their lives at risk and engage in activities that could lead to the contraction of HIV/AIDS and other sexually transmitted infections. As clearly indicated by countless studies within the past decade, abstinence only is not an effective way to prevent the spread of HIV/AIDS. Women, and especially women with a history of sexual abuse, are at high risk for HIV/AIDS infection. Despite public health efforts, the incidence of HIV infection in the United States has remained constant since 1999.[4] Heterosexual encounters account for 30 percent of the new cases of HIV and within these relationships, the woman is at significantly higher risk of infection. Studies on HIV have been focusing on education and motivation for abstinence, but a better outcome may be achieved if research could be financed to study all aspects of the sexual interaction that leads to HIV/AIDS, including aspects of sexual satisfaction and sexual function. Therefore, I suggest we include in our agenda basic sex research that looks at sexual function, sexual pleasure, and sexual satisfaction to better understand the risk factors that can be addressed in future prevention programs for HIV/AIDS infection and transmission. Congress itself lost such an opportunity back in 2003, when it decided to pull three grants because they investigated differences in physiological responsivity and pleasure in sexual activities when a man utilized a condom. Because of this history, sex researchers are wary of submitting grant proposals on topics that are directly related to sexual pleasure and sexual responses. However, we need this research, and the only way we can have this research return in our agenda is if we explicitly call for proposals for these topics.

In conclusion, sexual health is a key aspect of women's lives that we have neglected, and that directly and indirectly affects the quality of life and the overall health of women throughout the Nation. Women are in need of answers to their sexual health problems and unless NIH includes in their agenda resources to study these issues, women will continue to resort to untested treatments that, at best, will perpetuate their sexual difficulties and, at worst, will put other aspects of their lives at great risk. We have an opportunity at this point to support the scientific development of treatments that can positively affect a large portion of women. As sex researchers, we are ready to take on this challenge and work together with clinicians and researchers from other fields to ensure that women across the Nation can lead more satisfying lives. But we will need NIH to put female sexual health on their map. We cannot accomplish this goal without government funding, especially in the current economic crisis that has minimized even further the existing small pool of funding from private foundations that used to be available for sex research.

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ERIN BOLES, M.S.W.

Massachusetts Breast Cancer Coalition

The mission of MBCC is to challenge all obstacles to the eradication of breast cancer. Of primary concern to our over 10,000 members is the interaction between environmental toxins and the unnaturally high rate of breast cancer in the United States. It is our hope that in the upcoming decade, the National Institute of Health (NIH) will prioritize funding for research investigating primary prevention of breast cancer, particularly focused on possible environmental links to the disease.

In 1940, it is estimated that 1 in 20 women were at risk for developing breast cancer, that rate today is between 1 in 7 and 1 in 8. While we are optimistic that the rate of the disease has temporarily leveled off in recent years, it is important to keep in mind the historical context of that

data so as not to feel overly victorious of that success or assume that the work of fighting breast cancer is over.

In 2007, 240,510 women were diagnosed with various forms of breast cancer and underwent months or years of treatment and surgery to halt the disease. And 40,460 women died from breast cancer the same year. While only 5-10% of breast cancer can be attributed to a family history of the disease and approximately another 10% to lifestyle factors such as diet and exercise, 80% of breast cancer diagnoses go unexplained. With so many women's lives at risk, it is vital to prioritize research pertaining to primary prevention of the disease.

When looking at breast cancer rates over time, it becomes clear that there is much to be done to prevent breast cancer before it starts. With less than 1% of all breast cancer research funding dedicated to studying primary prevention of the disease, these women and their families must prioritize research aimed at stopping breast cancer before it starts. With 50% of research funding for breast cancer dedicated to research directed at preventing breast cancer and exploring the link between environmental toxins and the disease, rates of the disease could potentially drop 80% or more.

Research and data conducted over the past two decades indicate that there may be an environmental link to the development of breast cancer. Scientists are better understanding the connection between the damaging impact of endocrine disrupting compounds (EDC's), chemicals commonly found in everyday consumer products and industrial materials, and carcinogens on mammary cells. These various compounds, persistent in our environment, are found to trigger mammary tumor growth in laboratory experiments.

For instance, research from scientists at Tufts University Medical School conclude that exposure to the endocrine disrupting compound Bisphenol-A to female mice in utero results in higher breast cancer rates later on. And research by Silent Spring Institute on Cape Cod in Massachusetts, a location with among the highest breast cancer rates in the country, revealed substantially high levels of endocrine disrupting compounds in groundwater. Emerging science even indicates that these potent chemicals may interfere with the effectiveness of chemotherapy in breast cancer patients. More research in these areas is desperately needed.

As state health departments begin to review the science and determine these chemicals harmful enough to ban chemicals and issue warnings, such as the warning issued by the Massachusetts Department of Public Health against the use of products containing the endocrine disruptor Bisphenol A by chemotherapy patients, mothers and children, it is time for the nation's leading health research institute to provide greater access to research funding promoting further study on the impact of environmental toxins on health.

Therefore, Massachusetts Breast Cancer Coalition requests that NIH consider dedicating 50% of its funding for breast cancer research over the next decade towards primary prevention and environmental links to the disease, a percentage that, anecdotally, breast cancer survivors and family members believe to be necessary to stop the disease.

NANCY MULLER, M.B.A.

National Association for Continence

Female Pelvic Health Needs for Bladder and Bowel Control and Related Pelvic Floor Disorders

Thank you for receiving testimony from the National Association For Continence (NAFC) for the September 2009 public hearing of the Office of Research on Women's Health at the National Institutes of Health. I am Nancy Muller, Executive Director of NAFC. I have worked in this capacity for the past 10 years, serving on the organization's Board of Directors as far back as 1996. I am a graduate of Duke University and have my M.B.A. from the University of Virginia. I am currently a Ph.D. candidate in health services research and administration at Virginia Commonwealth University.

NAFC is a 501(c)3 corporation headquartered in Charleston, South Carolina. Our mission is threefold:

To educate the public about the causes, diagnosis categories, treatment options, and management alternatives for bladder and bowel control problems; nocturnal enuresis; voiding dysfunction, such as retention; and related pelvic floor disorders, including prolapse

1. To network with other organizations to elevate visibility and give priority to these health concerns
2. To advocate on behalf of consumers who suffer from symptoms as a result of disease or other illness; obstetrical, surgical, or other trauma; or deterioration due to the aging process itself.
3. NAFC is broadly funded by consumers, healthcare professionals, and industry. In existence for more than 25 years, it is among the largest and most prolific consumer education and advocacy organizations devoted exclusively to this field. More information can be found at our Web site: http://www.nafc.org

The constituency of women we serve, primarily those who are peri- or postmenopausal, remains frustrated with the lack of assurance that treatment for pelvic organ prolapse and stress urinary incontinence (SUI) will be successful. Many women avoid surgery altogether, they tell us, because they hear experiences of repeat surgeries after 5, 10, or 15 years from friends who have undergone surgery for similar diagnoses. For at least a third who elect surgery for SUI, symptoms either continue afterwards or grow worse. Even aside from the risk of immediate complications such as retention, pelvic pain and discomfort, urgency, and urinary tract infections, the promise that recovery will be fast and normalcy will be restored remains elusive for many. Women feel betrayed and disappointed. We need both additional innovation and clinical research to deliver an improvement in outcomes with the duration from surgical intervention that women deserve, while reducing the risks of adverse events.

We have far too much experimentation on women in everyday clinical practice, without evidence or direction of what is best for particular cases. Women often report when contacting the NAFC for guidance that they feel bewildered by the options presented to them. Others are understandably fearful of the lack of experience that some doctors actually have with a particular implantable device or the history of its use on other patients. The outcomes data that are quoted are also rarely relevant or understandable to the layperson.

Research is sorely needed to better identify those women at greatest risk of experiencing pelvic organ prolapse and stress urinary incontinence as they age, as well as the strategies they, as younger individuals, can undertake to best protect themselves against such occurrences. Based on our own consumer research, women with such diagnoses are equally divided on whether they feel a national research priority should be on finding the best treatment or how to prevent the problem in the first place.

A good example of the kind of research that is best suited to prevention is the work published recently by the UCSF Women's Continence Center/Center of Excellence documenting the correlation of obesity and weight loss with a significant reduction in symptoms of SUI in women. Findings like these, to be meaningful, need to be put into action by being translated into public policy and public education initiatives as well as public–private partnerships with healthcare payers and providers. Funding from the National Institutes of Health and the Centers for Disease Control and Prevention for such projects calls for careful coordination still missing from our fragmented approach to research, provider education, public health communication, and the application into practice of research findings.

Because of the barriers and frustrations encountered by women seeking diagnosis for SUI and pelvic floor dysfunction, including prolapse, the country deserves a public health education platform to improve everyone's understanding of the problem. Followup research is needed to identify the most effective and cost-efficient means of educating primary care providers and women in general on such topics, beginning early in a woman's life during maternal health engagement with her OB-GYN or family practice provider. NAFC's findings from our recent consumer research additionally call for the development of an instrument to assess consumer attempts to access diagnosis and intervention for pelvic organ prolapse specifically within the U.S. healthcare delivery system. Today, that effort is abysmal and embarrassing, as women repeatedly encounter closed doors, myths, and poor guidance from their doctors. Such an undertaking will help identify where communication is breaking down and most needed between patient and provider, as well as what messaging may be most effective in promoting self-advocacy on the part of the consumer as patient.

Funding priorities are desperately needed for additional research, heightened public health policy and education initiatives, and improved professional education of primary care providers. In addition, we need tighter practice standards by doctors and better tracking of devices and all procedural outcomes. Until such activities are better coordinated and more integrated across agencies, institutions, organizations, and companies, they will fail to be effective and meaningful for patients. American women will otherwise continue to live in the Dark Ages with respect to their female pelvic health, robbed of the quality-of-life freedoms they deserve.

LIZA FUENTES

National Latina Institute for Reproductive Health

National Latina Institute for Reproductive Health—Recommendation to the NIH on Priorities for Research on Women's Health

National Latina Institute for Reproductive Health (NLIRH) works to ensure the fundamental human right to reproductive health and justice for Latinas, their families, and their communities through research, community mobilization, and policy advocacy. NLIRH is a national organization with offices in New York, NY, and Washington, DC.

It is imperative that the National Institutes of Health (NIH) fund research and career development that includes and advances the role of Latinas in women's health research. Latinas are a significant and diverse portion of American women, but have significantly worse health outcomes compared to White women on many key health measures. The NIH must prioritize initiatives in women's health research that contribute to the elimination of health disparities in concrete and immediate ways. In order to do so, the NLIRH recommends that NIH prioritize and fund research on women's health in three main ways:

1. Prioritize research in social psychology, sociology, and public health that seeks to improve adolescent reproductive health outcomes, such as improved prevention and treatment of sexually transmitted infections, pregnancy prevention and planning, and the elimination of intimate partner violence.

   Social science research on the health of adolescent women is a critical priority. In 2006, Latina adolescents gave birth at more than twice the rate of White adolescents, although White and Latina young women do not have significantly different rates of reported sexual activity.[1] Specifically, Latinas' use of birth control pills declined dramatically between 1991 and 2007, and they are more likely than White and African-American girls to use "no method" of pregnancy prevention when having sex. The causes of these disparities are not as simple as Latinas' versus White girls' preferences for using contraception, but instead are closely connected to social and economic inequity. For example, one study, using a nationally representative longitudinal survey, found no racial or ethnic differences in teen birth rates among adolescents in the same socioeconomic quartile.[2]

   The difficulties Latina adolescents face that place them at higher risk for unplanned pregnancy are connected both to economic and immigration status issues. Latina adolescents are more likely than White adolescents to live in areas with poor access to family planning services. Neighborhood-level variables, including higher median household income and access to family-planning services are predictors of higher contraceptive use among adolescent women. Latina adolescents are more likely than their White counterparts to be without insurance; 20 percent of Latinos age 17 and under have no health insurance, a figure three times higher than the percentage of uninsured White youth.[3]

NIH research funding on adolescent women's health should focus on understanding and eliminating adolescent health disparities by reflecting the diversity of nationality, ethnic/racial background, cultural practices, language preferences, and immigration status of not only adolescent women themselves, but also their communities. This includes supporting a robust stream of policy research that evaluates the impact of specific policies on reproductive health outcomes for adolescent women. For example, research can provide a better understanding of the impact of laws requiring adolescents to seek parents' permission to receive sexual and reproductive health care. Similarly, policy research can document and propose changes for ensuring Medicaid coverage for emergency contraception and whether hospitals routinely provide emergency contraception to sexual assault victims.

This also includes prioritizing proposals that investigate not only overarching issues such as contraception use, but also their intersection and impact on other adolescent women's health issues like intimate partner violence or depression. For example, adolescent sexual health programs must be evaluated not only by the curricula content and services offered, but also if and how they take into account factors such as the immigration status and health insurance status of the youth involved.

2. Expand efforts to foster women's presence in health provider-scientist roles by supporting science education opportunities at multiple levels and by specifically supporting opportunities for women of color to become scientists.

   Women of color, and Latinas specifically, are highly under-represented in healthcare provider professions and research positions. In 2006–2007, Latinos earned just 5 percent of doctoral degree awarded, despite making up 14 percent of the U.S. population; only 21 percent of doctorates earned by Latinos were in the life sciences.[4] In 2004, Latinos accounted for 14 percent of the total United States population, but were only 3.2 percent of physicians. Similarly, Latinos only represent 4.3 percent of nurses and 2.8 percent of pharmacists.

   According to the United States Office of Minority Health, healthcare organizations should "ensure that patients/consumers receive from all staff members effective, understandable, and respectful care that is provided in a manner compatible with their cultural health beliefs and practices and preferred language." Additionally, these organizations should "implement strategies to recruit, retain, and promote at all levels of the organization a diverse staff and leadership that are representative of the demographic characteristics of the service area."[5] These essential principles of care must be extended to research on women's health because women of color are particularly negatively affected by health disparities. Health services research can and should contribute to strategies for ensuring these principles of care are met. The dynamic and diverse Latina population in the United States means that women's health and minority health intersect and are inextricably linked for millions of Americans; NIH research priorities for women's health must reflect this demographic and social reality.

   Many healthcare organizations are unable to fulfill these standards because women of color in general, and Latinas in particular, are drastically underrepresented both as

medical practitioners and researchers. The NIH explains that "Ensuring a diverse pool of physician-scientists and clinical investigators is an essential step in eliminating health disparities."[6] Recruiting more Latina healthcare researchers and providers will thus serve as a crucial step in providing better health care for Latinas, evidenced by the fact that Latino medical students are almost twice as likely as White medical students to plan to serve in underserved communities.[6]

Latino health personnel and healthcare researchers make health care more available and accessible as a result of their linguistic and cultural knowledge. While the data are discouraging, the strategies for solutions are exciting. In order to increase the number of Latinas, particularly those who are low income, and who are in the pipeline to do research on women's health and to enter healthcare professions, four key strategies and policies should be enacted.

- Federal, State, and local governments should create financial and social benefits to equalize access to training in health professions, with special attention paid to grants and scholarships at the high school, university, and graduate school level.
- Federal and State governments should provide housing stipends that allow for fulltime study for student-parents or students who support other family members, provide health insurance for both students and their families, and subsidize on-campus child-care for student-parents.
- Dedicate research funds to implement and evaluate community-based training programs for women in underserved communities who wish to become doulas; childbirth educators and peer breastfeeding counselors should be available in communities across the Nation.
- The scope of and the eligibility for the National Health Service Corps should be expanded to increase the capacity of Latinas to serve not only as healthcare providers, but also as researchers in women's health in exchange for educational support.
- The funding and support that the NIH has already dedicated to community-based participatory research (CBPR) should include and specifically focus on research on women's sexual and reproductive health.

3. One of CBPR's great strengths is in identifying and carrying out research that leads to timely changes that lead to improved health. Further, because behavioral and biomedical research play powerful roles in shaping healthcare policy and in forming public health policies, the NIH should prioritize research that aims to improve standards of care, improve delivery systems, and create strategies for overcoming cultural and economic barriers to health care. In order to support the applied, service-based research necessary to immediately contribute to the elimination of reproductive health inequities, the NIH should dedicate a portion of its CBPR proposals to research on women's sexual and reproductive health. Within a CBPR model, the determinants of reproductive health care and outcomes can be investigated in the context of critical but often overlooked experiences, like the need for immigrant healthcare service delivery and outcomes.

Further, innovative healthcare delivery models, like the promotoras de salud model, can be effectively implemented and evaluated through the CBPR model. Community health worker models, like promotoras de salud, have been shown to promote positive health behaviors, like vaccinations and cancer screenings, and connect underserved communities to services in a culturally and linguistically appropriate manner, but few of these programs have been evaluated for their impact on women's sexual and reproductive health. Research funding for program designs and evaluations that are rigorous and systematic, but still culturally appropriate, can lead to the evidence on how to effectively utilize these programs. CBPR methods bring both the critical needs of rigor and community-identified and driven research, making it possible to respond to Latinas' sexual and reproductive healthcare needs and invest in research that tells us what works and what doesn't.

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CHRISTIN VEASLEY

National Vulvodynia Association

Chronic Vulvar Pain Over the Lifespan

Millions of women suffer from vulvodynia, or chronic vulvar pain, and recent studies suggest that it can start as early as adolescence. The lack of scientific research in this field has perpetuated the misdiagnosis and inappropriate treatment of women suffering from the disorder. Since fiscal year (FY) 1998, the United States Congress has repeatedly called upon the National Institutes of Health (NIH) to fund more vulvodynia research. To date, only slightly more than $11 million, or a mere $1 million per fiscal year, has been allocated to research on the condition, funding only 12 studies in 11 years. Thus, the FY2010 NIH Appropriations Report contains the following language on vulvodynia:

The Committee remains concerned with the lack of progress in expanding research efforts on vulvodynia in recent years, and it strongly urges that the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) employ a full range of award mechanisms to substantially increase the number of awards for vulvodynia studies in fiscal year 2010. In addition, new research indicates that chronic vulvovaginal pain is also highly prevalent in the adolescent population and has been documented in children as young as 4 years of age; therefore, the Committee urges that consideration be given to collecting data on vulvodynia and related pain conditions in the National Children's Study. The Committee notes the lack of vulvodynia experts on peer-review panels and again encourages the Director to work with the Center for Scientific Review and other Institutes and Centers to ensure their adequate representation. The Committee also calls upon the Institute to continue efforts with the Office of Research on Women's Health (ORWH) on the vulvodynia educational campaign. Finally, the Committee notes that vulvodynia coexists with other persistent pain conditions, including interstitial cystitis, fibromyalgia, temporomandibular joint and muscles disorders, irritable bowel syndrome, endometriosis, and chronic fatigue syndrome. The Committee calls upon the NICHD to collaborate with the Office of the Director on a trans-NIH research initiative that will support studies aimed at identifying common etiological pathways among these disorders, with the goal of developing therapeutic targets.

In prior testimony titled, The Need for an Expanded Research Effort on Vulvodynia—A Prevalent and Neglected Gynecological Pain Disorder, the National Vulvodynia Association summarized vulvodynia's impact on women's physical and emotional well-being, and provided broad research recommendations. What follows is a summary of the results of recent published epidemiological studies and specific research recommendations by age group.

Reproductive Years

Population-based studies that include a clinical confirmation component demonstrate that 3–7 percent of reproductive-aged women suffer from chronic vulvar pain. Harlow and Stewart[1] surveyed 3,358 women, aged 18 to 64, from five diverse ethnic and socioeconomic communities in Massachusetts; they found that, at some point in their lives, nearly 16 percent reported a history of chronic burning, knifelike or sharp pain, or pain on contact that lasted 3 months or longer. Seven percent, or approximately 6 million women, currently experienced painful symptoms. Eighty percent of cases reported pain on contact only and 20 percent reported diffuse burning or knifelike pain. Ninety percent experienced ongoing pain for many years. Investigators performed a gynecological examination on a small subset of cases and confirmed a vulvodynia diagnosis in 80 percent. Caucasian and African-American women exhibited similar lifetime prevalence and Hispanic women were 80 percent more likely to experience symptoms compared to the other ethnic groups. Incidence of symptom onset was highest between the ages of 18 and 25, and lowest after age 35. Compared to controls, women with vulvar pain were seven times more likely to report difficulty and pain with their first tampon use. Nearly 40 percent never sought treatment; 60 percent of those who sought medical care reported visiting more than three providers and 40 percent remained undiagnosed after three medical consults.

Arnold[2] administered telephone surveys to 1,012 women between the ages of 18 and 80. Vulvodynia was defined as "vulvar discomfort, most often described as burning pain, occurring in the absence of relevant visible findings or a specific, identifiable neurologic disorder" and lasting at least 6 months. Lifetime prevalence was almost 10 percent, and point prevalence, i.e., the presence of symptoms within the 6 months preceding the survey, was almost 4 percent. Women reported a significant burden of illness that spanned across many facets of their lives. Sixty percent reported an overall compromised ability to enjoy life and 75 percent felt "out of control" of their bodies. Half reported moderate to severe impact on their sex lives, causing them to terminate sexual intercourse attempts or avoid sexual relations altogether. Compared to 325 controls, women with vulvodynia (n=100) were significantly more likely to report chronic medical conditions, including chronic fatigue syndrome (OR=2.78), fibromyalgia (OR=2.1), irritable bowel syndrome (OR=1.87), and depression (OR=2.99). Cases were twice as likely to report irregular menstruation, painful menses, and premenstrual syndrome; six times more likely to report three or more annual urinary tract infections; and four times as likely to report more than three annual yeast infections. One year later, investigators administered a followup questionnaire to 213 controls and 72 cases and found that nearly 5 percent of previously asymptomatic women now reported symptoms associated with vulvodynia.[3]

Reed[4] randomly surveyed 1,032 women between the ages of 18 and 85 through SurveySpot, an Internet survey panel, and found that a substantial number of women with a history of vulvodynia experience chronic intermittent pain. Almost 30 percent reported a history of pain in the vulvar vestibule (area surrounding vaginal opening) without accompanying "deep" pain. The prevalence of vestibular pain was similar for African-Americans and other ethnic groups. Eight percent reported experiencing pain within the past 6 months, 3 percent reported that the pain lasted more than 3 months, and almost 2 percent reported ongoing pain of 3 months or longer. If large studies uphold these estimates, approximately 2.4 million American women could have symptoms suggestive of vulvodynia.

Reed[5] also conducted an Internet and written survey of 1,046 women (19–92 years) who were members of the University of Michigan's Women's Health Registry and lived in a five-county area in Southeast Michigan. Ten percent reported a history of vulvar pain lasting more than 3 months; 3 percent were in remission and 7 percent were then currently experiencing symptoms. Twenty-eight patients and 34 pain-free controls underwent a gynecological examination and investigators confirmed a vulvodynia diagnosis in 90 percent of patient cases. Two years later, the investigators conducted a followup study of 744 of the surveyed women. Of the 372 asymptomatic controls initially enrolled, 13 women (3.5 percent) had developed vulvodynia symptoms, and 9 (2.2 percent) had ongoing pain. If confirmed in larger population-based studies, these data suggest that there might be more than 1 million new cases of vulvodynia per year in the United States. Younger-age and post-intercourse pain were associated with vulvodynia incidence. Remission, experienced by 22 percent of the 45 women with vulvodynia at enrollment, was more common in those who did not experience pain after intercourse and in those with less severe pain upon enrollment.[6]

Research Recommendations

- Large longitudinal population-based studies that include a clinical confirmation component are necessary to 1) confirm vulvodynia's lifetime and point prevalence; 2) determine risk factors associated with its development, e.g., vulvovaginal infection, early age of first intercourse, and oral contraceptive use; 3) determine factors associated with failure to seek medical care; and 4) identify screening and preventive strategies.
- Natural history studies of women with vulvodynia are necessary to 1) determine remission rates and factors associated with symptom improvement; 2) understand the difference between women with transient versus persistent pain; 3) assess the prevalence of other pain syndromes, including dysmenorrhea; and 4) investigate the difference between women with vulvodynia and women with vulvodynia plus a concurrent pain condition.
- Natural history studies of women with chronic pain conditions or other chronic vulvovaginal disorders (e.g., recurrent vulvovaginal infection, vulvar dermatoses) are necessary to determine 1) the prevalence of concurrent vulvodynia; 2) the likelihood of developing vulvar pain in the future; 3) factors associated with a future vulvodynia diagnosis; and 4) how women with one pain condition differ from those with multiple conditions.

Menopausal Transition

The prevalence of vulvodynia in postmenopausal women is unknown. Studies summarized in the above section included women up to age 92, but Harlow was the only investigator to report the age at symptom onset. Although reproductive status was not ascertained, he found that almost 4 percent of women between the ages of 45 and 54, and another 4 percent aged 55 to 64 years, reported symptoms of vulvodynia, e.g., burning or knifelike vulvar pain or pain on contact; in 50 percent of these cases, pain limited sexual intercourse. Recent population-based studies, including some postmenopausal women who took hormone replacement medication, found that the prevalence of painful sexual intercourse ranged from 2 to 7 percent.[7,8] In postmenopausal women, vulvovaginal pain is typically associated with declining estrogen and the ensuing tissue atrophy. Recent studies, however, suggest that a lack of estrogen is unlikely to be the sole cause of pain in postmenopausal women, i.e., estrogen supplementation does not alleviate vulvovaginal pain in all cases.[9,10] To date, researchers have not studied other factors that might cause vulvodynia in postmenopausal women.

Research Recommendations

- Large, longitudinal population-based studies (of both users and nonusers of hormone replacement therapy), which include a clinical confirmation component, are necessary to determine the prevalence of vulvodynia; risk factors associated with its development (e.g., hormonal changes, pelvic floor abnormalities); and preventive strategies.
- Natural history studies of perimenopausal women with vulvodynia are needed to determine factors associated with symptom improvement or exacerbation during the menopausal transition.

Childhood and Adolescence

Only one retrospective case study of six girls between the ages of 4 and 9 has investigated vulvodynia in the preadolescent population. Most girls in this study reported relatively constant pain, similar to that experienced by adult women with generalized vulvodynia. This condition may be largely "hidden" in children, because young girls do not use tampons and, in general, are not sexually active.

Researchers have not investigated the prevalence of chronic nonsexual vulvar pain in the adolescent population, and only a few have investigated painful intercourse. A cross-sectional study of 251 sexually active girls between the ages of 12 and 19 found that 20 percent reported chronic painful intercourse, i.e., lasting 6 months or longer.[11] Nearly 70 percent reported that symptoms started with their first intercourse attempt; the most frequently reported site of pain was the area surrounding the vaginal opening. Girls who experienced severe pain with first tampon use were four times more likely to report chronic painful intercourse. Interestingly, this study found that adolescent females who experienced painful intercourse did not avoid future sexual activity.

In an earlier study of 172 girls and young women (ages 12–26) who visited Swedish adolescent health centers, researchers found that 34 percent reported recurrent vulvar pain provoked by intercourse.[12] The following factors increased the risk of vulvar pain: regular intercourse before age 16; oral contraceptive use for more than 2 years; and a history of vulvar irritation, itching, and fissures. In another Swedish study of girls and young women aged 13 to 21 years, researchers found that 49 percent of those who had intercourse in the previous month experienced pain or discomfort.[13]

Research Recommendations

- Large, longitudinal population-based studies that include a clinical confirmation component are necessary to 1) assess the prevalence of vulvodynia in children and adolescents; 2) determine risk factors associated with its development, e.g., vulvovaginal infection, early intercourse, and early oral contraceptive use; and 3) identify screening and preventive strategies.
- Natural history studies of children and adolescents with vulvodynia are necessary to determine factors associated with symptom improvement or worsening during the pubertal transition, and identify the immediate and long-term consequences of having vulvodynia (e.g., avoidance of pelvic exams).
- Natural history studies of children and adolescents suffering from chronic vulvovaginal conditions (e.g., dermatological disorders, recurrent vulvovaginal infection) or chronic pain conditions are needed to determine the likelihood of future vulvar pain.
- Once risk factors are established, educational initiatives should be developed and studied to determine if awareness can alter behavior associated with the development of vulvodynia.

Pregnancy and Postpartum

Kennedy[14] conducted a prospective, longitudinal descriptive study of 103 pregnant women, in which self-administered questionnaires were completed at each trimester and 3 months postpartum. The prevalence of vulvar burning, itching, and pain increased during pregnancy and improved postpartum; however, painful intercourse increased during pregnancy and remained elevated postpartum. Paterson[15] was the first to investigate the prevalence of genital and pelvic pain in the second postpartum year. At an average of 14 months postpartum, 18 percent of 114 women reported current genital and/or pelvic pain lasting 3 months or more, and 26 percent reported an episode of resolved pain. Nine percent continued to experience pain that began after the birth of their last child. Many factors, including maternal age and number of prior births, were assessed, but only a history of nongenital chronic pain (e.g., migraine, back pain) significantly correlated with persistent pregnancy- or postpartum-onset genital/pelvic pain.

Research Recommendations

- Large, longitudinal population-based studies that include a clinical confirmation component are necessary to assess the prevalence of chronic vulvar pain during pregnancy and 12–24 months postpartum, as well as risk factors associated with its development.
- Natural history studies of women with vulvodynia are necessary to determine which factors are associated with symptom improvement or worsening during pregnancy and postpartum (both immediate and long-term).
- Longitudinal studies that follow women with various chronic pain conditions during pregnancy and 12–24 months postpartum are necessary to assess the risk of developing vulvodynia.

About the National Vulvodynia Association (NVA)

The NVA (www.nva.org) is the only international organization serving both vulvodynia sufferers and healthcare providers who treat the disorder. Created in 1994, the NVA's mission is to improve vulvodynia sufferers' quality of life through education, support, advocacy, and funding of scientific research.

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STEFANIE RUSSELL, D.D.S., PH.D., M.P.H.

New York University College of Dentistry

The Importance of Oral Health

As was stated in the Surgeon General's Report on Oral Health, ". . . oral health is integral to general health. You cannot be healthy without oral health. Oral health and general health should not be interpreted as separate entities." Indeed, links between oral and systemic health are at this point not just conjecture, but have been verified by empirical evidence, much of it gained through NIH-funded research.

Research in recent years that seeks to examine and clarify mechanisms of oral–systemic health links has tended to focus on the effects of oral health on systemic disease outcomes, including cardiovascular disease and preterm birth outcomes—diseases/conditions that are highly prevalent in women and justly deserving of attention. It is essential, however, that the bidirectionality of the oral-systemic relationship should not be forgotten or ignored; there are many systemic diseases, conditions, and medications/treatments for these diseases that can have profound oral effects. For example, osteoporosis and medications used to prevent and/or treat osteoporosis have been shown to adversely affect the oral cavity. Further research is certainly warranted to clarify the pathways by which osteoporosis and bisphosphonates affect oral disease progression, including periodontitis, and wound healing, including healing following tooth extraction. In addition, the effects of diabetes—including gestational diabetes, which places women at greater risk for diabetes later in life—on the oral health of women is an additional area where there is currently little data.

Also, attention should be paid to the fact that gender, as opposed to sex, i.e., that a woman's role in society as opposed to her biology, is likely to exert significant effects on her oral health. While it is well-established that the effects of hormonal alterations and fluctuations, including those during puberty, pregnancy, and menopause affect the oral tissues, what is less clear is how gender impacts issues that affect dental health—and the effects are likely to be no less than those that are biological in nature. For example, while it has been generally recognized that gender affects dental healthcare access and utilization, along with rates of dental health-promoting and health-damaging behaviors, research is seeking to illuminate the pathways by which these gender-specific behaviors affect oral disease rates. One area where there is urgent need for data is in the area of pregnancy and oral health. While it is recognized that the oral health needs of pregnant women are unique—that pregnant women may be at elevated risk of oral disease—there is little investigation in the area of examining issues of dental access and utilization by pregnant women. This fact is particularly worrisome, given that during this crucial time, dentists have been shown to be reluctant to treat pregnant women. What are the long-term effects of this reluctance, which paradoxically, comes at a time when women are likely to want to improve their own health—including their own dental health—in order to have a positive effect on their future children?

Finally, it should be recognized that good oral heath is a goal in itself—not only in relation to the overall health of the individual women, but in its own right. Barriers and facilitators to

good oral health are likely to vary by gender, given the differing roles of men and women—and clarification of these factors would likely go far in helping to design, create, and test ways to improve the oral health of women.

MARLENE MCCARTHY, H.L.D.

Rhode Island Breast Cancer Coalition

My name is Marlene McCarthy, Volunteer Chair of the Rhode Island Breast Cancer Coalition. My organization has been a part of the National Breast Cancer Coalition (NBCC) since its inception in 1992. I welcome the opportunity to present testimony on behalf of the National Breast Cancer Coalition (NBCC) and the Rhode Island Breast Cancer Coalition at this hearing on women's health research.

NBCC is a grassroots organization dedicated to ending breast cancer through action and advocacy. The Coalition's main goals are to increase federal funding for breast cancer research and collaborate with the scientific community to implement new models of research; improve access to high quality health care and breast cancer clinical trials for all women; and expand the influence of breast cancer advocates wherever breast cancer decisions are made. The NBCC has developed core values for breast cancer research that reflect its vision and are fundamental to all of its research-related work. NBCC's Position Statement on Core Values for Breast Cancer Research articulates and describes these values: integrity, impact, accountability, respect, beneficence, justice, shared decision-making, and flexibility. These values can and should be applied to all forms of women's health research.

I commend the Office of Research on Women's Health at NIH for embarking on this endeavor to collect information and solicit input from scientific and public policy experts, health care providers and advocacy organizations as it looks toward the next decade of women's health research. NBCC strongly believes that the enterprise of clinical and scientific research at NIH could be vastly improved with greater participation from educated health care consumers and trained advocates who can help to inform all aspects of decision making at the Office of Women's Health Research and across the Institutes.

NBCC also has deep concerns about the lack of transparency, external oversight and accountability in research priority-setting, decision-making and evaluation. What is important now is to determine the right process for and atmosphere within which women's health research will be prioritized and conducted. We must make certain that the process maximizes our getting the right research done in the right way.

Need for Greater Transparency, Oversight and Accountability

During this era of change, all federal agencies, but particularly at the NIH, must embrace and incorporate greater transparency and public accountability at every level and in everything they do. As our nation's foremost biomedical research institution, NIH's lack of diversity in stakeholder representation, dissenting viewpoints in evaluating programs and projects

is alarming. For instance, when NCI decided to evaluate the cancer centers, the committee chosen had a significant number of cancer center directors as members. The NIH Reform Act created the Scientific Management Review Board to conduct periodic reviews and issue reports on organizational issues at NIH. The NIH Director submitted the list of members of this Board to Congress, and its membership includes nine institute directors, several major institutions that receive significant funding from NIH and one industry representative. There were no consumer advocates as part of this Review Board. The Review Board clearly lacks independence and the ability to conduct meaningful oversight.

While there is a great deal of discussion about reform and innovation, there does not appear to be an overarching framework or objectives and a strategy to analyze past funding and to govern funding going forward, at least not one that includes meaningful benchmarks and critical evaluations and is accessible by the public and policy makers.

Taxpayers deserve to know that the agency tasked with charting scientific and medical breakthroughs is being prudent stewards of the billions being appropriated to its mission each year.

Consumer Advocate Participation in Research Decision Making

Consumers—lay advocates who are trained and educated—can play an integral role in ensuring that the research that is funded is responsive to needs of both the scientific and patient communities. Their perspective is necessary to ensure that the grants funded are meaningful and will have impact. Consumer advocates bring a vitally important perspective to scientific research, and they keep the scientists on task. Together, they can look at the current state of knowledge and then design appropriate and necessary mechanisms to allow scientists, in collaboration with advocates, to develop proposals to research the most important questions as well as advise on priorities for funding research. The Department of Defense Peer Review Breast Cancer research program has proven that this is an effective and valuable model of scientist-advocate collaboration.

The peer review process is the accepted method for identifying meritorious scientific trials and studies. However, the peer review process has traditionally excluded those most affected by research—the patients themselves. The peer review process is only enhanced by the involvement of advocate "peers"—activists outside the scientific and medical communities who bring a unique and important perspective to the scientific discussion. Ideally educated advocates must be included on all research peer review panels in both the public and private sector.

Clinical trials are another critical area for advocate involvement. Advocates can provide important insights into the design of clinical trials and invaluable assistance in increasing awareness and knowledge of clinical trials. They must be substantive collaborators in the research process. Moreover, it is important to have meaningful advocate involvement in scientific meetings in which the Office on Women's Health is involved. Advocates must be part of program planning committees and participate as session chairs or co-chairs. There must be opportunities for interaction between scientists and advocates at discussion sessions and in mentoring programs. Finally, advocates must be provided opportunities to present their work and their perspective at poster and platform sessions.

Educated advocates can have a meaningful impact on how best to communicate information and research findings to providers, patients and the public. The NBCC framework for national health care reform calls for a national panel to be established to work with the public to review evidence and help design effective methods for communicating health care information to consumers, providers and plans.

An example of where educated advocates played a critical part in the development and evolution of a research project is the Women's Health Initiative (WHI). As you are well aware, it is a large clinical trial, one part of which looked at a particular hormone replacement therapy—progestin plus estrogen vs. placebo—to determine the benefits and risks of that approach. The trial was supposed to end in 2005, but it was stopped in 2002 because the overall health risks of HRT exceeded the benefits. In fact, the trial showed an increased risk of breast cancer as well as heart disease, blood clots and stroke. Women had taken HRT for years before the trial was conducted to look at these issues. While the intervention aspect of the trial was stopped, that is, women were no longer given the drugs, HRT or placebo, as in any well-designed trial, the investigators continued to follow the women.

After several years of following these women after the trial stopped, it was determined that the cardiovascular risks were no longer greater in the group of women who had taken HRT than in the women who received placebo. However, it appears that the breast cancer risk may continue. While the higher risk remained throughout the intervention and the follow up period, looking at the follow up period alone, the results were not statistically significant. What does that mean? Since we are not certain what drugs the women took after the trial was stopped—or what else changed in their lives—and because the follow up was only three years, we cannot yet say with certainty that the breast cancer risk continues. We can say that it is likely.

It is important to keep in mind that the Women's Health Initiative would not have happened without advocacy from the women's community. It is very important to remember that women took these drugs when there was no high level evidence they would benefit and not harm them. And it is extremely relevant to note that advocacy groups such as the National Breast Cancer Coalition questioned the lack of evidence behind these drugs for many years.

Conclusion

In summary, the agenda for women's health research must be set and implemented in an atmosphere of transparency and through a process that is accountable and includes trained, educated advocates.

We must make certain that the public can access and understand allocation of resources and the vast array of research projects being undertaken. NIH must enhance its ability to conduct meaningful science through these changes.

Again, I thank you for the opportunity to present these views and look forward to working with the Office of Women's Health Research and others at NIH to transform the Institutes, conduct meaningful research and give the American public greater insight and involvement in women's health research and biomedical research in general.

KATHERINE SILBERMAN, J.D.

Science & Environmental Health Network

Testimony of Katherine Silberman, Associate Director, Science and Environmental Health Network

Thank you for giving me the opportunity to testify. My name is Katherine Silberman and I am the Associate Director of a national nonprofit organization, the Science and Environmental Health Network (SEHN), with an office here in Providence.

SEHN is a grassroots-oriented think tank for the environmental movement, and a leader of the successful movement to reform environmental and public health policy from the community level up, based on the precautionary principle. SEHN is a communal think tank; our ideas come through work with real people working on real problems, and with government bodies committed to their role as protectors of the public's well-being. We shape the ideas into usable forms as policies, arguments, and information; continue the dialog and learning with our many partners; and help implement the ideas in the real world.

I am here today to urge the Office of Research on Women's Health (ORWH) to consider women's environmental health as a major research focus. Of the priorities outlined by ORWH for the next several years—including normal processes, aging, and emerging diseases—environmental health affects each one. Indeed, environmental factors are causally linked to disease across a women's entire life cycle, from conception until death. Due to time constraints, I will only discuss a few examples, following the timeline of a woman's life cycle.

Reproductive Health

Birth Defects

Human life itself depends on women's ability to bear healthy children. We know that birth defects are a major cause of miscarriage and fetal death, and that nearly half of all pregnancies today result in the loss of the embryo or fetus, often very early in pregnancy. Many of these losses are due to problems that would have resulted in birth defects.

The cause of most birth defects is unknown, and many seem to be caused by some combination of genes and environment. But some direct correlations have been drawn between specific environmental chemicals and specific outcomes. Endocrine-disrupting chemicals such as Bisphenol-A can cause hypospadias in baby boys, a condition that has doubled in incidence in 20 years. A number of studies have linked pregnant women's pesticide exposure to birth defects, including fetal death. Perhaps most alarmingly, recent studies have shown that certain chemical exposures in utero can actually change the genetic makeup of the baby, and can be passed down to that baby's descendants—meaning that a single exposure might harm a family's health for generations to come.

Childhood

Asthma

The number of children with asthma in the United Sates has more than doubled since 1980. Although genetic factors are involved, environmental factors are almost certainly responsible for such dramatic increases in incidence rates.

In the United States, asthma is most common in African-American children living in urban areas. Ozone and fine-particle pollution from diesel engine exhaust have been causally linked to childhood asthma, and kids growing up along streets with heavy truck traffic are more likely to have asthma-related respiratory symptoms.

Pesticide exposure has also been liked to asthma. A recent study found that infants exposed to herbicides and pesticides before age 1 were much more likely to develop early persistent asthma. Childhood asthma causes tremendous suffering for the kids, expense for the families and for society, and causes children to miss school.

Neurological Disorders

Childhood brain disorders such as learning disabilities, behavioral and emotional disorders, and autism have all been liked to environmental exposures. The developing brain is extraordinarily complex, and seems to be affected by some combination of genetic, environmental, and social factors. But several environmental chemicals have been causally linked to neurological damage, including lead, mercury, perchlorate, solvents, and some pesticides.

Particularly concerning is the effect of environmental exposures on the developing brains of fetuses, babies, and children. Much is unknown about brain science, but we do know that the developing brain perinatally and during early childhood is exquisitely sensitive to chemical disruption, and that certain times of exposure are particularly dangerous. A chemical that could have no lasting effect on an adult brain could irreparably damage the brain of a developing fetus or toddler.

Adulthood

Breast Cancer

Almost every single one of us now knows a woman who has had breast cancer. The rise in breast cancer incidence rates in recent years points to contributing environmental factors. We do know that more than 200 chemicals have been identified as mammary carcinogens by international agencies. Specific chemicals that have been linked to breast cancer include several pesticides, Bisphenol-A, polycylic aromatic hydrocarbons (which are products of combustion), dioxins, phthalates, and parabens. These latter two may be of particular concern because of their ubiquity in women's personal care products, such as lotion and makeup that women spread on their bodies every day.

Aging

Parkinson's Disease

Like most neurological diseases, the causes of Parkinson's Disease remain largely unknown. However, many studies point to the interaction of genes and environmental factors. Chemicals that have been causally linked to Parkinson's include pesticides such as Rotenone and Paraquat, and heavy metals such as aluminum, iron, and lead.

Alzheimer's Disease

Alzheimer's, like Parkinson's, seems to be caused by the interaction of genetic, environmental, and social factors. Chemicals of concern include lead and other heavy metals, PCBs and other persistent organic pollutants, pesticides, and endocrine disruptors. But scientific evidence points to a more disturbing trend: Alzheimer's disease seems to be linked to other serious diseases of modern times. Diabetes, obesity, hypertension, elevated blood lipids, and metabolic syndromes—like Parkinson's and Alzheimer's—appear to stem from inflammation and excessive oxidative stress. My organization, the Science and Environmental Health Network, recently released a report entitled, *Environmental Threats to Healthy Aging: With a Closer Look at Alzheimer's & Parkinson's Diseases.* The report calls this group of diseases the "Western Disease Cluster," and explains how environmental factors are contributing to rising incidence rates and what policymakers can do to reverse the trends. I would like to submit the report to the panel today for your consideration.

Conclusion

In the interest of brevity and clarity, my remarks today have been limited to spotlighting specific chemicals that are causally linked to specific diseases across the female life cycle. Unfortunately, though, such one-to-one causation is not how any of us live in our daily lives. Instead, we are constantly exposed to thousands of chemicals—and perhaps most crucially, to the combined effects of several chemicals at once. Through a combination of the lack of sufficient regulatory laws and the slow pace of science, the health effects of most of these chemicals are largely unknown. The health effects of the combination of dozens or even hundreds of chemicals in our bodies—which is the situation many of us are in right now—are unfathomable. What we do know is that environmental links to women's diseases are real, the science is catching up, and meanwhile the human, financial, and societal costs of these diseases are immense.

I am speaking today in my professional capacity as Associate Director of a national advocacy organization. But I am also speaking as a mother and daughter who has experienced, within my own family, infertility, pregnancy loss, breast cancer, ovarian cancer, and other diseases that affect so many women's lives. In both capacities, I urgently petition the ORWH to consider environmental factors in women's health, and to take action to protect women and girls from developing diseases that we know can be preventable. In 12 years, you will be able to look back proudly and rightly claim your mantle as a leader in the field of environmental health science, knowing that you prevented suffering in women across the country.

Notes

- Scientific references may be found at the Web site of the Collaborative on Health and Environment: http://healthandenvironment.org/diseases, or by request.
- Submission during oral testimony: Environmental Threats to Healthy Aging: With a Closer Look at Alzheimer's & Parkinson's Diseases (report by the Science and Environmental Health Network, 2008. Also available at http://www.agehealthy.org).

JULIA BRODY, PH.D.

Silent Spring Institute

Environmental Pollutants and Women's Health: Research and Public Health Policies Affecting Exposures Across the Lifespan Hold Promise for Prevention of Breast Cancer and Other Hormonal Health Effects

Thank you for the opportunity to testify today. My name is Julia Brody. I am the Executive Director of Silent Spring Institute and an Adjunct Assistant Professor in the Department of Pathology here at Brown Medical School and in the Department of Epidemiology at the Boston University School of Public Health. Silent Spring Institute is a nonprofit research organization founded by leaders of the Massachusetts Breast Cancer Coalition to study the links between the environment and women's health, with a focus on breast cancer and a goal of prevention. Silent Spring Institute's multidisciplinary scientific staff has conducted research in collaboration with researchers here at Brown University and at Harvard, Tufts, Boston University, the University of California–Berkeley, the U.S. Centers for Disease Control and Prevention, and elsewhere. Our research is funded by the National Institutes of Health, the National Science Foundation, and the Avon Foundation for Women, among others, and published in peer-reviewed scientific journals, including *Cancer, Environmental Health Perspectives, Environmental Science & Technology,* and *American Journal of Public Health.*

Why Focus on Breast Cancer Prevention?

Breast cancer is the most common invasive cancer in women worldwide and the leading cause of death for U.S. women from their late 30s to early 50s, years when they are raising children and contributing to their communities.[1] Screening and improved treatment have improved survival, and incidence has dipped, since many women went off hormone replacement therapy. Although we hope and expect these trends to continue, treatment is likely to remain arduous and debilitating for the foreseeable future, with significant adverse effects. Financial costs of treatment are substantial, amounting to $8.1 billion in the United States in 2004, according to the National Cancer Institute. While these statistics represent the aggregated burden of breast cancer, no one in this room need look very far to see that burden personified in a mother, sister, daughter, friend, coworker, or neighbor. That's why leaders of the Massachusetts Breast Cancer Coalition; the Breast Cancer Fund; Breast Cancer Action; women on Long Island, New York, and in Marin County, California; and in other breast cancer organizations across the country have called on our nation to tackle primary prevention as the goal—not just early detection, not just new chemotherapy, not chemoprevention with costly drugs that have their own downside, but fewer women getting sick because environmental causes of breast cancer have been controlled. The good news is that scientific evidence supports this ultimate goal as entirely realistic.

Environmental Pollutants and Breast Cancer: What Do We Know Now?

My remarks target the possible role of environmental pollutants and the need to uncover and address the effects of environmental pollution across the lifespan. While my focus is on breast cancer, the chemicals of interest for breast cancer are also relevant to other hormonal cancers (e.g., ovarian, endometrial), fertility, puberty, obesity, and other health outcomes of importance for girls and women.

I led a team of researchers from Silent Spring Institute, Harvard University, Roswell Park Cancer Institute, and the University of Southern California that reviewed the scientific literature on breast cancer and environmental pollutants in Cancer, a peer-reviewed journal of the American Cancer Society, and in an online database, which was highlighted as a "Net watch" selection by Science.[1,2,3] This project, which also reviewed scientific evidence on breast cancer and physical activity, body size, diet, and early life exposures, was supported by Susan G. Komen for the Cure. You can access the published papers, database, and lay summaries at http://www.silentspring.org/sciencereview.

Given that breast cancer is influenced by exposures that begin prenatally (for example, twinning and preeclampsia)[4] and extend within the 5 years before diagnosis (for example, hormone replacement therapy), the task of identifying effects of environmental pollutants in human breast cancer studies is daunting, so we are wise to begin by assessing, first, the evidence from animal and cell studies of plausible biological mechanisms and, second, the evidence that people are substantially exposed.[5] I have previously discussed this line of reasoning at greater length in my invited testimony last year before the President's Cancer Panel, which focused for the first time on environmental factors and cancer.

Laboratory evidence supports at least three biological mechanisms that may link environmental pollutants and breast cancer: 1) chemicals that cause mammary gland tumors in animals are predominantly mutagens, acting as classic carcinogens that damage DNA; 2) chemicals called endocrine-disrupting compounds (EDCs) mimic or block hormones, including estrogen, a known breast cancer risk factor; and 3) developmental toxicants can divert development of the mammary gland in ways that may permanently increase susceptibility.[6,5,3]

The chemicals that show these types of biological activity are ubiquitous environmental pollutants and are common in workplaces, consumer products, and building materials.[7,8,9] Before I discuss examples, though, let me emphasize that most chemicals in use today have never been tested for these effects.

Turning to chemicals that have been tested in animal cancer bioassays, 216 chemicals caused mammary gland tumors.[9] About 100 are common exposures: 73 have been present in consumer products or as contaminants in food; 35 are air pollutants; 25 have been associated with occupational exposures affecting more than 5,000 women a year; 29 are produced in the United States in large amounts, often exceeding 1 million pounds per year; and 47 are pharmaceuticals. Examples of mammary carcinogens include polycyclic aromatic hydrocarbons (PAHs, e.g., in air pollution, auto exhaust, tobacco smoke, and grilled and smoked food); mutagen X, a byproduct of drinking water chlorination; benzene, which is in gasoline; ethylene oxide, a common sterilant in healthcare and food processing; methylene chloride, an industrial solvent; amsonic acid, an optical brightener in laundry detergents; and some pesticides. A recent study by the Kaiser health plan in Northern California supported the relevance of the animal model to humans, finding that for three of six pharmaceuticals they evaluated from our review, breast cancer incidence was increased in women taking those medications.[10]

Estrogen mimics, chemicals that make human breast cancer cells proliferate in the laboratory, include Bisphenol A, the topic of numerous news stories last year about baby bottles, toys, sports water bottles, food can liners, and other products; many pesticides; and compounds in cleaners and personal care products, like hand lotions and make-up (ourstolenfuture.org). EDCs are now common pollutants in surface water and groundwater that supplies drinking water.[7]

For endocrine-mediated developmental toxicants, diethylstilbestrol (DES) is an important model. We learned tragically that a mother's exposure during pregnancy increases cancer risk, including breast cancer, in her offspring. Animal studies show stunted mammary gland development and increased susceptibility to mammary carcinogens following in utero exposure to the EDC dioxin, and evidence of similar effects on mammary gland development is accumulating for additional chemicals, including the pesticide, atrazine, widely used in the United States.[12] Research showing that low doses of chemicals can distort development is one of the most troubling and rapidly growing fields of science, and it requires additional support.

Turning to human exposure to chemicals that fit these three profiles, the *National Report on Human Exposure to Environmental Chemicals*[13] is the best source of information on the typical exposure to environmental pollutants in the U.S. population. This resource is how we know that public health measures to reduce exposure to lead and environmental tobacco smoke are working. The study has tested for about 15 of the animal mammary gland carcinogens and for selected EDCs, including, for example, some pesticides and phthalates, dioxins, polychlorinated biphenyls, and brominated flame retardants. Because the Government has been so slow to address the health effects of environmental pollutants, a number of advocacy organizations have tested for these and additional chemicals in children and adults across the country. Results show that all of us carry residues of numerous toxic chemicals in our bodies, often at levels shown in other studies to be biologically relevant.

My own research team has focused on understanding where these exposures come from through our study of 89 EDCs in 170 urban, suburban, and rural homes, located far from industry and in mostly nonagricultural areas.[9,14] For 30 of the chemicals, our Cape Cod, Massachusetts, "Household Exposure Study" was the first report on levels indoors. We found 67 different EDCs; the average home indoor air sample contained 19 different compounds. We found 27 different pesticides in house dust and indoor air. EDCs from sources like laundry detergent and cosmetics were among the most abundant chemicals detected and were found in nearly every home. We found DDT, banned in 1972, in two-thirds of the homes. The mundane ways in which high exposures arise is illustrated by our case studies of PCBs and brominated flame retardants. We unexpectedly found very high levels of PCBs in two homes with no obvious source; one home's resident had higher blood levels than anyone in the CDC National Exposure Report. We discovered the likely cause was a common floor finish used in the 1950s and 1960s. This story is not simply the legacy of a bygone era. In our latest research, we found levels of brominated flame retardants in California blood samples and household air at 2 to 10 times the levels elsewhere, likely due to the State's unique furniture flammability standard, which encourages use of these chemicals.[15] These findings are the result of our unfortunate "innocent until proven guilty" approach to placing chemicals into widespread use.

The limited epidemiologic research on environmental pollutants and breast cancer reveals that very few of the chemicals identified as animal mammary gland carcinogens or EDCs have ever been included in a human breast cancer study.[2] Studies that have been done are often limited by lack of good measures of exposure. Nevertheless, the epidemiologic literature provides some evidence of associations between chemical exposures and breast cancer. Four studies of PCBs show higher breast cancer risk in women with a genetic variation that affects its metabolism.[2] A unique study with access to stored blood collected in young women in 1959–1967 found 5-times-higher breast cancer risk associated with higher DDT exposures before age 14.[16] Some studies of PAHs, air pollution indicators, environmental tobacco smoke, dioxin, and organic solvents provide evidence of increased risk, particularly in young women or with exposure at a young age.[2]

Research and Public Health Implications

Our current research and public health programs are not set up to identify and respond to potential health risks from numerous environmental pollutants and chemicals in commerce. I urge the Office of Research on Women's Health to proactively work to incorporate research about environmental pollutants across the lifespan. I recommend to you the California Breast Cancer Research Program (CBCRP) Special Research Initiative[17] as a model that begins to address the priorities for change that I outline below.

Develop Research Funding Programs That Explicitly Focus on the Role of Environmental Pollutants in Disease Etiology

We must expand our nation's investment in prevention, including studies of environmental pollutants. For women's health, priorities must include research to identify and understand chemicals that are mammary gland carcinogens, endocrine disruptors, and developmental toxicants.

Develop and Apply Methods for Chemicals Screening

Just as our medical research agenda includes translation of basic science into treatment protocols, environmental health research requires translation into evidence-based public health policies. In order to reduce harmful environmental exposures, we need to develop the research base for rational chemicals-use policies. That means we need methods, including high-throughput tests, to screen larger numbers of chemicals more thoroughly and at realistic costs for mutagenicity, carcinogenicity, endocrine disruption, and developmental toxicity. Pharmaceutical companies are using new technologies for drug discovery; we need public investments to apply these techniques to chemicals screening.

Develop and Apply Methods for Exposure Assessment

Similarly, we need new methods to measure exposure in environmental and biological samples and expanded laboratory capacity to evaluate samples from diverse communities and settings. New methods are needed to integrate effects of chemical mixtures. The National Exposure Report is an important monitoring tool that should be expanded to additional chemicals and more detailed subpopulation assessments, and we should immediately update the 1980s National Occupational Exposure Survey assessment of women's workplace chemical exposures.

Work With and Advocate Increased Funding for Agencies With Environmental Science Expertise

Government programs with the expertise to advance environmental health research and risk reduction are the National Institute of Environmental Health Sciences (NIEHS), including the National Toxicology Program; the U.S. Environmental Protection Agency; the National Center for Environmental Health at the U.S. Centers for Disease Control and Prevention; the National Institute for Occupational Safety and Health; and the intramural Occupational and Environmental Epidemiology Branch of the National Cancer Institute.

Support Public Engagement

In order to guide public interest in science and inspire public commitment to research and policy change, scientific leaders must take responsibility for forming research partnerships that engage, educate, and empower Americans to participate in environmental health science and policy development. These efforts should achieve the same standards of excellence we expect of technical science. The NIEHS community-based participatory research program and California Breast Cancer Research Program offer useful models and there is much room for expansion and further innovation.

Support significant focus on environmental pollutants in the best cohort studies. The National Children's Study, Sister Study, Agricultural Health Study, Breast Cancer and the Environment Research Centers, and studies of accidentally exposed cohorts are examples of important resources for our future that can expand research on environmental pollutants.

Silent Spring Institute was named, of course, in honor of Rachel Carson and her pioneering 1962 book, *Silent Spring*, which reported on careful scientific observations of die-offs and deformities in fish, birds, insects, and amphibians to alert us to the dangers of releasing untested chemicals into the environment. Carson was one of very few women on the lists of the most important people of the 20th Century. She is a hero to girls everywhere who dream of scientific careers. She died of breast cancer just 2 years after publication of her world-changing book. As she struggled through treatment for her own disease, she wrote in *Silent Spring,* "For those in whom cancer is already a hidden or a visible presence, efforts to find cures must of course continue. But for those not yet touched by the disease and certainly for the generations as yet unborn, prevention is the imperative need." I hope you will heed her guidance as you set the research agendas that will determine the future for the next generations of girls.

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Reproductive Health and the Environment

In 2008, I earned my Ph.D. in sociology from Brown University, with a focus on the relationship between human health and the environment. I now teach part-time in the Community Health Program at Tufts University, while raising my son and writing about women's health and chemical body burden, among other topics. I am grateful for the opportunity to submit testimony on behalf of myself to encourage the National Institutes of Health (NIH) Office of Research on Women's Health to prioritize research on environmental health research, with a specific focus on the contribution of chemical pollution to women's reproductive health. Based on my doctoral research, I suggest that special attention be afforded to those women who live in "hotspots" where chemical pollutants are used, stored, or unexpectedly accumulate, such as the circumpolar North.

My testimony provides evidence that women's environmental health, and particularly the field of reproductive environmental health, merits special attention by the NIH based upon prior research and consensus statements issued by experts in the field.[1] I conclude with a brief commentary about the value of involving impacted women and communities in future research, and on the need for translation of reproductive environmental health research to clinicians who treat women in OB/GYN practices, hospitals, and community health centers.

A growing number of healthcare providers report a rise in patients seeking treatment for infertility and other reproductive health issues.[2] While current research suggests that reproductive health may be supported or compromised by several factors, including age, genetics, nutritional health, stress, and pharmaceutical use,[3] mounting scientific evidence also supports that environmental chemicals and contaminants commonly found in the human environment, drinking water, and food supply can influence human fertility and reproduction, albeit in complex, often poorly understood ways. Several symptoms or conditions that span a woman's lifecycle have been linked, or are associated with, environmental exposures. These include the following:[4]

- Malformed reproductive organs
- Premature ovarian failure
- Premature or delayed menarche[5]
- Infertility or compromised fertility

- Recurrent pregnancy loss
- Inability to carry baby to term, pregnancy compromise, birth defects, congenital abnormalities, and low birth weight
- Premature menopause
- Uterine fibroids

Researchers also report rising rates of diseases or conditions known to affect human fertility in which environmental exposures might also play a role in their etiology, including endometriosis and polycystic ovarian syndrome.[1]

Though more research is critical, reproductive environmental health researchers agree there is already a substantial body of evidence implicating low-level exposures as a likely contributor to trends currently seen in reproductive outcomes.[1]

Timing of Exposures

Scientists now know that the placenta does not shield the developing fetus from chemicals or pollutants the mother encounters.[6] As a result, many conditions and diseases of women's reproductive tracts have origins in exposures encountered during particular periods of fetal development.[1]

The effect of in utero exposures was first seen among the children of women who were, beginning in the 1940s, prescribed DES, a synthetic estrogen, to prevent miscarriage. Though not apparent at first, as exposed children reached puberty, a pattern of reproductive health problems emerged. Followup research has confirmed a host of outcomes in both the male and female children of women who took DES, including rare reproductive cancers and malformed reproductive organs, menstrual irregularities, and infertility or subfertility, i.e., difficulty conceiving.[7] Today, DES serves as one model for how fetal exposures during critical periods of fetal development can affect reproductive health in later life stages.

A body of evidence now demonstrates that many chemicals humans routinely encounter in the environment can mimic or interact with the endocrine system, and like DES, can affect the fertility and reproductive health of offspring, though through other biological mechanisms.[6,8] Synthetic or human-made substances can exhibit estrogenic, androgenic, or antiestrogenic and antiandrogenic properties. That is, they can act like hormones, or block normal hormone function, which in turn, affects reproductive development.[6]

So-called "endocrine disruption" of human reproduction by environmental chemicals has been demonstrated in animals, but more recently in humans, as well. A 2003 study published in *The Lancet* found that women with higher in utero exposures to DDT—a pesticide banned from use in the United States, but still used in other countries and present in circumpolar ecosystems[9,10]—took longer to conceive once they reached reproductive maturity.[11]

Environmental chemicals also interfere with the fertility of subsequent generations by altering how genes direct key biological processes. Anway et al.[12] found that when pregnant female mice were exposed to two commonly used pesticides, vinclozolin and methoxychlor, the exposures compromised the fertility of male offspring in three subsequent generations. This is the first study to find multigenerational effects. Although the study was performed on mice and involved exposures that are higher than humans might encounter, it is biologically plausible that similar trends might be seen among humans since genetic processes are known to be reasonably similar in both species.[12]

Sources of Environmental Exposures

In some instances, women are exposed by inhaling air or drinking water that is contaminated by pollutants. Exposures can occur at home or on the job, outdoors as well as indoors, as many reproductive toxicants found in building materials, furnishings, and consumer products can collect in household air and dust,[13] a burgeoning area of environmental health science in women's health. In some cases, exposures can occur when substances containing reproductive toxicants are absorbed into the skin, such as phthalates (pronounced 'thal-lates'), which are commonly added to self-care and beauty products.[13]

While researchers document these compounds in air, water, soil, foods, and consumer products, research also confirms that these substances enter the body. Ongoing population monitoring conducted by the U.S. Centers for Disease Control and Prevention (CDC) reports that the average American carries detectable levels of various reproductive toxicants that are also present in the environment.[14] In general, many chemicals and pollutants, because of their chemical and physical characteristics, either build up in human systems rather than being excreted, or are ubiquitous so that, even if successfully excreted by the body, constant re-exposure maintains elevated body levels.

Sometimes these substances are detected in human bodies at levels known or suspected to affect the reproductive system, and at levels that have flagged the attention of researchers and healthcare providers alike.[1] More commonly, however, at the low levels detected, scientists and government researchers are uncertain about whether and how such compounds affect the function of the human body[15] and the reproductive system. This uncertainty, in part, stems from limited scientific research in this area. One recent tabulation concluded that less than 10 percent of the 100,000 chemicals currently registered for commercial use have been studied for their human health effects and in particular, for what reproductive effects they might pose.[16]

Research To Eliminate Exposures in Chemical Hotspots

Regarding exposures, special attention must be given to those women facing disproportionate exposure burdens in the United States. Here, I focus on the unique burdens borne by Alaska Native women, like women throughout the circumpolar region, who bear a disproportionate burden of environmental contaminants.[17,18,19,20] In the United States, several known or suspected reproductive toxicants and endocrine-disrupting compounds, such as polychlorinated biphenyls (PCBs) and pesticides, have been detected in the Alaskan environment and food system, as well as in the blood of some Alaska Native people[18,20,22] and other circumpolar populations.[17]

For women living in the Arctic and sub-Arctic regions of the United States, these chemicals and contaminants originate from both local and remote sources. Many chemicals and heavy metals are produced or released into the environment by industries located in the Lower 48 States and throughout the world, but because they are slow to degrade, and can travel vast distances in air and water currents, they tend to condense, concentrate, and then persist in the cold, northern climate. As a result, the circumpolar Arctic region has become a hemispheric sink for many pollutants and chemicals that may pose reproductive risks.[18,23] Local industries and formerly used defense sites are also likely sources of exposures to heavy metals (e.g., lead and mercury) and industrial chemicals (e.g., PCBs) in Alaska.[24] PCB exposures, a particular concern in some regions of Alaska, may result not just from global transport, but also from formerly used defense sites in Alaska.[21]

Persistent pollutants such as these enter the food chain, where they concentrate in the fatty tissues of predator species. As a result, many of these pollutants are found in the foods that sustain a significant portion of the Alaskan population.[18,19,20,22] Although a significant public health concern, traditional foods remain the best source of sustenance for Alaska Native women, as they are both nutritionally rich and culturally essential. Thus, there is a critical need to reduce exposures to these chemicals before they are released into the environment and enter the food chain, and for research to help mitigate against current exposures in the immediate environment. Additionally, interventions with and translation to clinicians and health professionals would enable them to better track and treat women facing reproductive health issues with possible environmental contributions.

Research Shift: From Studying Specific Chemicals in Isolate to Complex Mixtures

In 2005, researchers working in reproductive environmental health identified the following compounds as high priority for research on reproductive effects:[1]

- Commonly used agricultural and household pesticides
- Plastics additives (used in production of plastics, e.g., Bisphenol A [BPA])
- Perfluorinated compounds (used in production of stain-resistant, water-repellant, or non-stick surfaces)
- Chemical additives to beauty and self-care products
- Polybrominated diphenyl ethers (PBDEs) (used as flame retardants in household upholstery and electronics)

Although ongoing research focuses on the reproductive toxicity of these substances, new scientific evidence also advances our understanding of the reproductive concerns posed by PCBs, dichlorodiphenyltrichloroethane (DDT), and other organochlorine exposures. Thus, these, too, remain a priority concern, as scientists continue to specify what reproductive outcomes matter, how they affect the reproductive system, and at what levels. This also supports the need for exposure-reduction research.

However, most importantly, there is a critical need for more research on the reproductive risks posed by routine, low-level exposures to environmental chemicals. In particular, research needs to identify the effects of multiple, simultaneous exposures, which better account for the reality that women encounter reproductive toxicants and endocrine-disrupting compounds in complex mixtures.[25] It is plausible that when substances interact, they may increase or mediate effects in unforeseen ways. Studying complex, low-dose mixtures, or "real-world" exposures is one of the most important, although challenging, research needs in the field of women's environmental health.

A Special Note on Research Process and Translation

Much of the research I've done on human health and the environment followed research questions that were initially posed by communities, particularly by women facing environmental pollution. Moreover, women and the communities they represent became deeply involved in the research process by helping to shape its conduct and translation through, in many instances, community-based research grants funded by the National Institute of Environmental Health Sciences. Sociologists have documented the importance of community-based participatory research programs in this field of study as essential to designing and carrying out groundbreaking research.[26,27] Therefore, I encourage future research to prioritize the deep involvement of women and impacted communities in all stages of the research process, as well as research that investigates the merits of this type of research in overall exposure reduction. And for women who participate in such studies, I also encourage research teams to provide women (and communities) the option to receive their results should they want them. My colleagues, research mentors, and I have documented that the women who participated in a novel personal-exposure study wanted to know more, not less, about the chemicals in their everyday environments and bodies, and wanted to understand the full ramifications of that reality, even if the health implications are not yet, or poorly, understood.[28,29]

Second, I would encourage coordinated translation and outreach to medical professionals, healthcare providers, and community health workers who treat women with reproductive diseases, symptoms, and conditions with potential environmental links, but whose professional education, in general, offered little training in the area of environmental health. Specific translation projects of value include 1) organizing continuing education programs, grand rounds, professional conferences, and workshops on reproductive environmental health; 2) developing curricula for medical and professional schools in environmental health; 3) developing systematic ways to routinely collect environmental and occupational health histories; and 4) fostering research that tracks infertility and reproductive outcomes, and analyzes trends in light of patterns of environmental exposures. (For more ideas, consult Schettler, Solomon, Valenti, and Huddle's *Generations at Risk: Reproductive Health and the Environment* [1999], which includes a primer for clinicians [chapter 10].)

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Endocrine Disruptors and Reproductive Health: The Case of Bisphenol A

My name is Maricel V. Maffini and I am representing a research group at Tufts University School of Medicine (Boston, MA) that has spent more than a decade investigating the effects of exposure to the synthetic estrogen, Bisphenol-A (BPA), during early development. Our research on BPA is funded by the Federal Government through the National Institute of Environmental Health Sciences and we do not have any conflict of interest or financial disclosure to reveal.

The data we and other independent, Government-funded researchers have collected thus far in the field of environmental toxicology are sufficiently robust to raise concerns about the potentially deleterious impact of this endocrine-disrupting chemical on human development.

A 2008 study from the U.S. Centers for Disease Control and Prevention (CDC) found that 92.6 percent of 2,500 Americans tested have detectable levels of BPA in their urine. The highest levels were found in children and adolescents. BPA has also been found in breast milk, amniotic fluid, and serum from pregnant women and fetuses, providing evidence that this chemical crosses the placental barrier. Although the majority of human exposure is through food and drinks, a study conducted in intensive-care-unit-bound babies showed that these vulnerable individuals have 10 times more BPA in their urine than adults; BPA has been found to leach from plastic tubing and drug delivery devices, as well. Oral exposures occur because BPA leaches from metallic food and beverage cans coated with a protective resin containing BPA, polycarbonate baby bottles, and reusable water bottles, as well as paper and cardboard used as food containers. These are just a few examples of consumer products leaching BPA.

Human populations, including unborn babies, infants, children and adults, are regularly exposed to low doses of BPA. A recent large epidemiological study revealed positive correlations between urinary BPA concentrations and the prevalence of diabetes, heart disease, and liver toxicity. Recently, studies using human breast cancer cells revealed that BPA interferes with chemotherapeutic agents commonly used to treat breast cancer patients. In addition, animal studies indicate that developmental exposure to environmentally relevant levels of BPA

alters development of the brain, the male and female reproductive tracts, the mammary gland, and other organ systems. More importantly, BPA exposure increases the risk and incidence of prostate and mammary cancers in rodents. In other words, animals exposed during critical periods of development will develop a variety of chronic diseases that usually manifest many months after the exposure has ended.

The consequences of BPA exposure are long-lasting in laboratory animals and there is no reason to doubt that this is also the case for humans. Based on the results obtained using laboratory animals exposed to low doses of BPA during perinatal development, we are confident that the conclusions drawn by us and others are relevant to the human population at large. Ignoring the data collected using animal models will not stop endocrine disruptors from causing harm to human populations.

For all the aforementioned reasons, I would like to recommend banning BPA, in particular in all children's products; educating pregnant women and their partners, and those wishing to become pregnant to avoid exposure to BPA-containing products; and educating the public at large on the risks of exposure to commonly used chemicals that interfere with endocrine system.

The time has come to discuss in depth this very important public health issue. Thank you very much for your attention to this matter.

CYNTHIA ZEMBO, B.S.N., RN, IBCLC

United States Breastfeeding Committee

Moving from Why to How in the Protection, Promotion, and Support of Breastfeeding for Optimal Health Outcomes

Thank you for the opportunity to present testimony regarding women's health research priorities for the next decade. My name is Cynthia Zembo. I am a registered nurse and a board-certified lactation consultant (IBCLC). I am honored today to speak to you as a representative of the United States Breastfeeding Committee (USBC). The USBC is an independent nonprofit coalition of 41 nationally influential professional, educational, and governmental organizations representing over half a million concerned professionals and the families they serve. The USBC and its member organizations share a common mission to improve the Nation's health by working collaboratively to protect, promote, and support breastfeeding.

What We Know About Breastfeeding

1. Breastfeeding is associated with significantly reduced risk of acute and chronic illness for infants and children in developed countries. This includes decreased incidence of acute otitis media, nonspecific gastroenteritis, severe lower respiratory tract infections, atopic dermatitis, asthma, obesity, type 1 and type 2 diabetes, childhood leukemia, sudden infant death syndrome (SIDS), and necrotizing enterocolitis.[1]

2. Reduced risk of illness is also documented for women who breastfeed. Women who breastfeed are less likely to develop cardiovascular disease,[2] metabolic syndrome,[3] rheumatoid arthritis,[4] type 2 diabetes, and breast and ovarian cancer.[1] Limited or no breastfeeding is associated with an increased risk of maternal postpartum depression.[1]

3. Health advantages of breastfeeding continue beyond weaning for both mother and child. Breastfeeding and lactation may therefore impact the health of women and their children across the lifespan for both females and males.

4. A dose-response relationship exists between breastfeeding and reduced risk of disease for both women who breastfeed and their children. Duration and exclusivity of breastfeeding are important variables in maternal and child health outcomes. A greater number of cumulative total months of lactation are associated with decreased risk of cardiovascular disease, type 2 diabetes, and breast cancer for women.[1,2,3]

5. Based on the strength of existing evidence, exclusive breastfeeding for the first 6 months is recommended for healthy-term infants by numerous health authorities, agencies, and professional organizations, including the United States Department of Health and Human Services, United States Agency for International Development, American Academy of Pediatrics, American Academy of Family Physicians, Academy of Breastfeeding Medicine, American Dietetic Association, American College of Obstetricians and Gynecologists, National Association of Pediatric Nurse Practitioners, International Lactation Consultant Association, and others.[5]

6. Since infants who are not breastfed have more frequent illnesses in the first year of life, the cost of not breastfeeding is sizable and impacts not only the individual family budget, but also healthcare costs associated with increased illness, and lost wages and worker productivity when parents must care for children who are sick. Commercial infant formula for a year costs at least twice the expense of the additional food a lactating mother is advised to consume. Increased healthcare costs associated with greater illness among formula-fed infants has been estimated at $331–$475 per never-breastfed infant in the first year of life.[6] An estimated $3.6 billion dollars could be saved annually for treatment of just three childhood ailments (otitis media, diarrhea, and necrotizing enterocolitis) if the HP 2010 goals for breastfeeding initiation, duration, and exclusivity were met.[7]

7. The healthcare costs associated with increased chronic illnesses among women who do not breastfeed have not been calculated or published to date, although are undoubtedly as significant if not greater than figures calculated for the increased illnesses among children not breastfed.

8. The nationwide breastfeeding initiation rate of 73.9 percent is approaching the Healthy People 2010 goal of 75 percent. However, even with modest gains in the past decade, the number of infants continuing to be breastfed at 6 and 12 months, as well as the rates for exclusive breastfeeding at 3 and 6 months, are not yet at the national health goals.[8]

9. Breastfeeding initiation, duration, and exclusivity rates are significantly lower and furthest from the Healthy People 2010 goals among women who are unmarried, under 20 years of age, those with a high school education or less, as well as for non-Hispanic Black and Native American women, and those living in southern U.S. States and more rural areas.[9]

10. It is notable also that 60 percent of U.S. women report that they were unable to meet their own breastfeeding goals.[10]

11. Hospital birthing and postpartum practices impact breastfeeding initiation duration and exclusivity rates. Maternity care practices associated with improved breastfeeding duration and exclusivity include initiation of breastfeeding within 1 hour of birth, use of only human-milk feeds, assistance with positioning to avoid sore nipples, use of rooming-in, on-demand feeding, no use of pacifiers, no offer of formula gifts upon hospital discharge, and connection to post-discharge breastfeeding support.

12. Mothers who experience a greater number of these maternity-care practices consistent with the evidence-based 10 Steps to Successful Breastfeeding outlined by UNICEF and WHO are significantly more likely to initiate and sustain higher rates of breastfeeding[11,12,13,14,15] even among population subgroups with traditionally low breastfeeding rates.[16]

13. Only 2.6 percent of U.S. births occur in hospitals/birth centers that have been independently assessed and found to consistently practice all 10 Steps to Successful Breastfeeding.[17]

14. Research to date has focused largely on the physiology of lactation and the nutritional and immunological components of human milk. Since the mid-1990s, a minority of federally funded research projects in the categories of infant nutrition, breastfeeding, and lactation have been directly or indirectly related to improving breastfeeding rates in this country. Only 13.7 percent of funding in years 1994 to 1996 went to projects involved in increasing breastfeeding rates.[18] Of 426 research projects in the categories of infant nutrition, breastfeeding and lactation that were awarded Federal funding between 2003 and 2006, less than 1 percent addressed the Healthy People 2010 Goals of increasing exclusive breastfeeding rates.[19]

15. The most common reasons women report that they stop breastfeeding before they intended to are inadequate milk supply (real and perceived), inability to satisfy infant with breastfeeding, latch difficulties, nipple pain/damage, and return to work or school.[20,21,22]

16. Maternal risk factors for delayed and/or inadequate milk production include mechanical issues that prevent adequate emptying of the breast such as difficulty latching the baby correctly, and medical issues such as diabetes, obesity, excessive gestational weight gain, traumatic birth experience, cesarean section, smoking, preterm delivery, polycystic ovarian syndrome, and previous breast surgery.[5]

What We Need to Know about Breastfeeding: Research Priorities for Breastfeeding, Lactation, and Optimal Women's Health

The majority of new mothers in the United States today choose to breastfeed. Unfortunately, most of these women fall short of their own desired goals for how long and how exclusively they are able to breastfeed their infants. Many stop in the first weeks after birth. Increased funding for applied research is needed to determine and evaluate innovative delivery models and interventions to more effectively support breastfeeding across all segments of the birthing population.[18] So that the long-term disease prevention and cost savings associated with the normal physiologic process of breastfeeding are more widely appreciated by our nation's women and their children, the following gaps in knowledge must be addressed:

1. Identify effective strategies to reduce disparities in breastfeeding initiation, duration, and exclusivity rates across socioeconomic status, race/ethnicity, education, and geography
    - Assess and ensure consistent advice, strategies, and support for exclusive breastfeeding from healthcare providers
    - Assess cultural competency of healthcare providers regarding breastfeeding practices/values
2. Identify strategies to increase exclusive breastfeeding among women who both breast and formula feed
    - Identify effective methods to educate parents about normal infant sleep patterns/behaviors in exclusively breastfed infants
    - Identify effective interventions to maximize milk production and breastfeeding duration for women with known risk factors for lowered milk supply
    - Examine the effects of hormonal birth control methods on milk production of women with adequate breastfeeding support, both in the hospital and as out patients
3. Identify and ensure consistent definitions and measurements for breastfeeding (exclusive, partial, minimal, none) across funded research projects
    - Delineate any differences in health outcomes related to exclusive versus partial breastfeeding and direct breastfeeding versus the feeding of expressed human milk
4. Identify effective preservice training methods to ensure core competencies in breastfeeding support/lactation management for all categories of healthcare providers working with women of reproductive age
    - Identify strategies to address healthcare-provider barriers to adopting evidence-based breastfeeding management practices
5. Examine effect of birth interventions (anesthesia/analgesia/instrumental delivery, induction of labor, cesarean delivery) on infant suck, establishment of milk supply (lactogenesis II), breastfeeding duration, and exclusivity
6. Examine cost-effectiveness of implementing 10 Steps to Successful Breastfeeding/Baby Friendly Hospital Practices for Birthing Facilities

7. Examine the cost-effectiveness of IBCLC breastfeeding care
    - Evaluate optimal lactation consultant: Patient ratios for inpatient, outpatient and community settings as they relate to exclusive breastfeeding duration rates and health outcomes
8. Examine expanded use of donor human milk and updated technologies for donor milk banking

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CHRISTIE LANCASTER, M.D.

University of Michigan

Future Directions in Perinatal Mental Health

Thank you for the opportunity to present our testimony. I am presenting as a representative from the Women's Mental Health Program at the University of Michigan to discuss future directions for the national research agenda in the area of perinatal mental health. The Women's Mental Health Program is a multidisciplinary team of psychiatrists, psychologists, social workers, pediatricians, and obstetricians with a shared mission to advance clinical care, research, and teaching in the area of mental health throughout a woman's lifespan. Our group has a particular focus on perinatal mental health.

Why discuss perinatal mental health?

- Psychiatric illnesses during pregnancy and the postpartum are common, detectable, and treatable.
- These disorders represent some of the most common complications in pregnancy. For example, more than 1 in 10 pregnant women will suffer from major depression.[1] In comparison, the prevalence of gestational diabetes is about 2–3 percent.[2]
- The perinatal period provides a unique window in which providers can address mental health. We have already captured the target population for screening because most pregnant women will utilize prenatal care at some point in their pregnancies. Perinatal women also have repeated visits over a several-month span, providing many opportunities for intervention and followup. Also, obstetric practices are experienced with screening and management for other public health concerns. We have developed systems to screen and treat infectious diseases, genetic disorders, and gestational diabetes, just to name a few.
- There is a growing recognition of the need to address perinatal mental health. This is evidenced by screening recommendations and new treatment algorithms from the American College of Obstetricians and Gynecologists and the American Psychiatric Association.[3]
- Yet, despite this awareness, we know that perinatal mental health care is a relatively new, fast-paced field within obstetrics, psychiatry, and psychology. Translation of evidence-based practices into perinatal care faces many obstacles, including a limited evidence base from which to start.

We applaud the release of program announcements such as Women's Mental Health in Pregnancy and the Postpartum Period (PA-09-174) to broadly address this important problem for women in their reproductive years. And we would like to offer a few considerations for future directions in funding.

How do you build shared decisionmaking models that are applicable to the clinical context?

Psychiatric treatment during the perinatal period is a rapidly evolving field. Often the science, particularly in regard to antidepressant therapy, is developing so fast that providers and patients find it extremely difficult to stay current and accurately informed.

Unfortunately, most women with psychiatric illnesses during the perinatal period are not receiving treatment. If we take the example of depression, fewer than one in five women with depression receive any or adequate treatment around the time of childbearing.[3] And more than one-half of women with recent antidepressant use discontinue their medications directly as a result of conception.[4] How can we improve engagement with care for women with perinatal mood disorders and for providers treating these patients?

We feel that addressing mental health during the perinatal period should involve collaborative decisionmaking between the patient and provider. Tenets of this model include taking into account patient preferences and values, considering treatment options appropriate for the clinical situation, and balancing nonmedication treatment options with rational use of medications. However, our research has shown us that behind the development of such collaborative models lies a complex interplay of influencing factors as perceived by the patient and the clinician.

For the patient, these factors include the following:

- Practical considerations: Where will the treatment be located? What assistance do I have with the referral process? What are my treatment options?
- Psychological factors: What do I know about my illness and my treatment? What will others think (concerns about stigma associated with treatment for depression)?
- For providers, contextual factors include external influences such as training, resources, and system coordination. Providers are also affected by patient norms, such as the stigma of mental illness in motherhood, and healthcare system priorities. However, the most directly involved factors for providers include internal influences such as the following:
  - Familiarity: How well do I know the specialists in my region? Do I know my patient well enough to discuss mental health issues?
  - Feelings of certainty: Can I rely on my referral network for support and assistance? How do I build trust with my patient so that she will follow up? What am I comfortable with given the risks and benefits? How confident do I feel about this?
  - Role identity: How do I view my job description? What meaning does my role have? Whom am I responsible for?

We feel that research directed at implementation science and decisionmaking models that are tailored to such contextual factors can improve treatment engagement and treatment adherence. Such research can improve the translation of evidence-based treatment recommendations into clinical practice. While our group is particularly interested in this type of model-building within the context of perinatal mental health, it has potential generalizability to other aspects of women's health care, such as treatment of menopausal symptoms.

The Importance of the Maternal-Infant Dyad

The first year of life marks a dramatically shifting period of external to self-emotional regulation, which is facilitated by interactions with primary caregivers. Parents' mental representations of the relationship with their infant may have particular impact on emotional development.[5]

On another note, given the pervasive concerns surrounding antidepressant use during the perinatal period, it is important to enhance the study of nonpharmacologic psychotherapeutic treatments. If you consider both of these factors together, the importance of interpersonal processes and the need for treatment alternatives, you can envision the particular role for dyadically-based depression interventions. We advocate for future funding goals to focus on the development and testing of these promising intervention models.

We believe that mother-infant dyadic therapies are an important complement to individual psychotherapy. There is mounting evidence to suggest that such interventions are more efficacious than individual treatment in improving parenting and infant outcomes. Many of these dyadic therapies are rooted in psychodynamic and attachment theories. Others include alternative techniques, such as infant massage, structured developmental assessments, and progressive relaxation.

By focusing future research efforts into the study of dyadic interventions, we can broaden the menu of safe and effective treatment options for women suffering from perinatal depression. In addition, we can study whether the use of such interventions can alter the intergenerational transmission of risk between parent and child.

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JULIA MCQUILLAN, PH.D., M.A.

University of Nebraska–Lincoln

The Importance of Population-Based Research for Understanding Women's Health Issues

Good afternoon and thank you for this opportunity to talk about the future of research on women's health. My name is Julia McQuillan. I am an Associate Professor of Sociology at the University of Nebraska–Lincoln (UNL), Director of the Bureau of Sociological Research at UNL, and a Co-Investigator on a *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) grant to study infertility pathways and psychosocial outcomes. My goal today is to use findings from our ongoing research to demonstrate the utility of learning about attitudes and experiences of the general population for a more comprehensive understanding of women's health.

My research team was fortunate to have UNL financial support to show the feasibility of studying infertility using population-based survey methods. That pilot project showed the feasibility and fruitfulness of studying fertility and infertility in the population as well as in medical clinics. Thus, the NICHD awarded us a grant to expand our research from 12 to 48 States, and to interview women and their partners twice.

We use sociological perspectives to identify social structures that are taken for granted yet potentially modifiable that facilitate or inhibit women's health. Our goal is to advance understanding of the complexities and subtleties of fertility experiences among women and couples. Research on patients in clinics provides rich insights about those who seek medical help, but studying only help seekers misses about half of the women who meet the medical criteria for infertility. Some health-related concerns (e.g., involuntary childlessness) do not have biomedical causes (e.g., when women face situational barriers to pregnancy). Some biomedical solutions (e.g., assisted reproductive technology) can solve nonbiologically-based problems (e.g., lack of a male partner who is willing or able to help a woman conceive a child).

Our project is called the National Survey of Fertility Barriers; the first wave of data is publicly available at http://sodapop.pop.psu.edu/data-collections/nsfb. This population sample has revealed the great extent of fertility barriers among women between the ages of 25 and 45. Using telephone interviews, we obtained pregnancy histories, information on help-seeking for infertility, and psychosocial information on 4,712 women and 932 of their (mostly male) partners. Including both standard definitions of infertility (12 months of regular intercourse without contraception or conception), and broader conceptualizations of fertility barriers (including health problems that make pregnancy more difficult and social barriers such as not having a partner), we are developing a comprehensive portrait of the behavioral and psychosocial responses to fertility barriers among women in the United States.

Several findings from the first wave demonstrate the utility of population-based research on fertility:

- Women vary in the degree of planning they use for pregnancies. Changes in reproductive technology, laws, and social norms make it theoretically possible for most women in

the United States to plan their pregnancies—yet we find that many do not plan (for first pregnancies, about a third said that they were trying NOT to get pregnant, a third said that they were trying TO get pregnant, and another third said that they were "okay either way"). Some report later that they wish that they had had more information when they were younger, or that they had planned more. Other researchers have shown that barriers remain to full access to abortion, contraception, and reproductive care, but these do not fully account for the gap between fertility behavior and stated fertility intentions in the United States. It is reasonable to assume that women will make deliberate choices about and take specific actions to ensure reproductive preferences. Yet we find that a substantial proportion of women do not.

- There is considerable ambiguity and complexity among women in their approaches to pregnancy. As is evident from the large percentage of women who are "okay either way" about getting pregnant, the conventional dichotomies of planned/unplanned, wanted/unwanted pregnancies do not apply to many women. These findings suggest the importance of rethinking whether fertility "decisionmaking" is as purposive and conscious as is often assumed. This may be of particular concern when considering emotional and behavioral responses to fertility barriers. We have theoretically integrated infertility help-seeking pathways within larger life-course fertility pathways linked to fertility intentions and outcomes in response to our emerging findings.

- According to the National Survey of Family Growth, 15 percent of U.S. women reported "impaired fecundity" in 2002.[1] Wave 1 National Survey of Fertility Barriers data show that 46.3 percent of American women aged 25 to 45 reported infertility at some point in their lives. We measured additional fertility barrier categories such as sterilization regret, other physical health problems, miscarriages, and situational barriers. Approximately 68 percent of women in this representative sample reported experiencing fertility barriers at some point. For example, 4 percent now regret surgical sterilization and 10.3 percent have had miscarriages but no other fertility barrier. Almost 7 percent have faced situational barriers to fertility, even though they have not faced biological barriers. Thus, fertility barriers have affected many American women at some point in their lives.

- The medical definition of infertility implicitly assumes that women who have intercourse without protection intend to become pregnant. People seeking medical treatment for infertility are especially motivated to have children and are likely to say they are trying to get pregnant. Clinicians and researchers working with infertility help-seekers usually presume that intent to conceive is an integral and unambiguous part of the criteria for infertility. If we broaden the scope of our analysis to include nonhelp-seekers, we include women with 12 months of unprotected intercourse who answered "no" when asked, "Were you trying to get pregnant?" Because many people do not plan births or make other fertility decisions in the conscious ways researchers sometimes assume, we need to incorporate attitudes toward planning pregnancy and fertility intentions in research on infertility. We found in the initial interviews that 48.2 percent of infertile women said they tried to conceive for at least 12 months without conception at some point in their lives and that 51.8 percent of these infertile women reported having had unprotected intercourse without conception, but did not indicate they were consciously trying to conceive

at the time. We refer to the former group as "infertile with intent" and to the latter as "infertile without intent." Only a little more than one-third (37.4 percent in Wave 1) of the women who met the medical criterion for infertility thought of themselves as having had fertility problems.

- Descriptive research, primarily from women who self-identify as having fertility problems, presents a picture of infertility as a devastating experience, especially for women. In a review of infertility research, Greil[2] noted a number of dominant themes, including infertility as a central focus for identity, feelings of alienation from the "fertile world," a sense of social stigma, and immersion in the treatment process. More recent studies have confirmed and elaborated upon previous characterizations of the infertile, and shown the influence of the pronatalist context in the United States on women's fertility experiences. A striking finding from our work is that the infertile with-intent score significantly higher on fertility-specific distress than do the infertile without intent. This suggests the importance of understanding the characteristics of those who suffer and those who do not suffer from involuntary childlessness.
- Higher surgical sterilization regret among Native American and Hispanic women compared to White women suggests that approaches to reproductive care are inconsistent across racial groups, even statistically controlling for socioeconomic status.
- We also found the need to rethink the meaning of secondary infertility for American women. The most common notion of primary infertility is infertility among women with no prior children. Yet many women have pregnancies without a live birth, either because of miscarriage, a stillbirth, or an abortion. Should women who have had a pregnancy but no live birth be classified as having primary or secondary infertility? This is an important question, because distress and help-seeking differ by primary/secondary status. Our findings suggest that women with a pregnancy—regardless of the outcome—are more similar to each other on measures of distress and medical help-seeking, and different from women who have not had a pregnancy.
- Additionally, many women regret the fertility and infertility decisions that they have made. Because these decisions are often time-sensitive and irreversible, they are quite difficult to make. Women with insufficient information do not use birth control and then regret pregnancies, or get tubal ligations and then meet partners that they want to have children with. Making decisions about how far to go with medical help to have a child compared to seeking to adopt are quite challenging, and many people have little information regarding lifelong outcomes to help them with the decision.
- Although infertility is conceptualized as a couple condition because either partner can be the "cause" of the problem, solutions to infertility often focus on women's bodies. Therefore, it is unclear if medical help-seeking depends only upon women's attitudes. Research from our couple sample suggests that both partners contribute to the decision to pursue medical help for infertility or not.

Our population-based longitudinal study provides insights on the causes and consequences of help-seeking among infertile women.

Using the life-course perspective combined with a perspective of "constrained choices," we see the benefits of integrating infertility help-seeking processes into broader models of fertility behavior, assessing links between fertility ideals, behavior, and intentions among fecund and infertile women and their effects on fertility and psychosocial outcomes. Although technological and medical changes have increased reproductive options for both the fecund and the infertile, fertility in the United States is far from a simple reflection of fertility desires and intentions. The high incidence of mistimed and unintended births among the fecund indicates that we still have an incomplete understanding of fertility pathways.

Much research focuses on women's and couples' reproductive choices, but our previous work and current data suggest that there is a continuum of deliberation and planning toward reproduction. Women who are undecided about fertility intentions are more likely to delay and then forgo pregnancy. Similarly, they may be less likely to take effective steps to prevent pregnancy. Women who have weaker fertility intentions may not take actions to overcome fertility barriers, but it is equally possible that confronting fertility barriers will strengthen intentions. There are many other changes (e.g., divorce, marriage, job loss, and friends' pregnancies) that could increase or decrease how deliberate women and couples are about pregnancy.

Racial/ethnic, socioeconomic, and lifestyle variations in fertility trends and pathways are likely to condition responses to fertility barriers. Black and Hispanic women are more likely to experience infertility than non-Hispanic White women, but less likely to seek medical services for help getting pregnant.

Help-seeking also varies by indicators of social class. For example, 56 percent of college graduates with fecundity impairments have sought help compared to 41 percent of those with less education; further, 47 percent of those with private health insurance have sought help compared to 28 percent without.[3] Lifestyle differences are also related to fecundity impairments. For example, sexually transmitted diseases and infections—known to vary by race, socioeconomic status, and union status—are associated with substantial increases in infertility for both men and women.

On average, involuntary childlessness is more distressing for women than for men. Fertility researchers often measure only women's intentions and expectations, but it is important to consider possible differences between partners and the implicit and explicit negotiations that take place between partners. Help-seeking pathways are complex and dynamic. Infertile individuals and couples are constantly weighing their options, rethinking their identities, and making new plans. During this process, distress levels and relationship satisfaction may well have an impact on infertility decisionmaking.

Expanding infertility research to include a broader conceptualization of fertility barriers shows the benefits of a representative sampling approach linking fertility expectations and outcomes for better understanding responses to infertility. Women who meet the medical criteria for infertility have a biomedical cue to fecundity impairment. If they are not trying to get pregnant

at that time (fertility expectations), they would rarely be studied in clinic-based infertility research. Women who have fewer than their desired number of children or who have experienced miscarriages, health barriers to childbearing, sterilization regret, or see themselves as having a problem would be counted in clinic-based research only if they perceive and act upon the fertility problem. Women who face situational barriers to infertility, including lack of a suitable partner or marriage dissolution, will also only be identified in clinical research if they seek help conceiving to address circumstantial childlessness.

The long-term consequences of fertility barriers are particularly important to assess because, unlike many reversible actions (e.g., delaying education), fertility pathways are time-specific and irreversible. Therefore, there is a need to study the consequences of fertility decisions for those who have passed reproductive age. These pathways are dynamic, involving changes over time. Biological limitations on the duration of female fertility mean that temporal elements are an ever-present feature of fertility pathways. Research suggests both social and biological limits to fertility postponement.

Infertility is a general public health concern, with important psychosocial consequences for women and couples, which has been highlighted by NICHD as central to its health and social policy agenda. Fertility research is important to businesses, policymakers, and researchers to ensure fertility services, access, and support for the consequences of negative outcomes. Finishing the second wave of this study will illuminate the causal ordering of events and outcomes. With a third wave of data, we would gain insights from women who have completed their reproductive years.

We see the need to place special emphasis on disparities in expectations, barriers, pathways, obstacles, and outcomes. In conclusion, findings from population-based longitudinal research show how crucial information outside clinical studies is for comprehensive understanding of and approaches to women's health.

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WILLIAM BURLINGHAM, PH.D.

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Letter in Support of Continued Research in the Area of Reproductive Immunology and Immunologic Tolerance

Over the past several years, the Office of Research on Women's Health (ORWH) has been a focal point for women's health research at the National Institutes of Health (NIH) and has supported a vigorous research agenda in women's health. I am happy to have been asked, as an immunologist working in the field of reproductive immunology and transplantation, to issue a challenge to the ORWH attendees at the conference in Providence, RI, to consider neonatal tolerance and maternal-fetal stem cell exchange as two of the critical areas for research into health and disease in the next 10 years.

Over the past 20 years, my lab's research has been primarily concerned with immunologic tolerance to transplants, that is, the ability of a patient, when given an organ transplant, to succeed in weaning himself or herself from all immunosuppressant drugs, relying only on the natural ability of the immune system to accommodate to the foreign tissue. Most of the time, this attempt ends in disaster, with the process of graft rejection eventually taking hold and destroying the transplanted organ. However, from the very beginning of our research, we saw exceptions to this rule. The first happened to be a kidney transplant from a mother to her first-born son. This transplant lasted nearly 10 years, even though the son had discontinued all immunosuppression in year 2. We discovered that mother had transplanted more than her kidney. In fact her cells, although rare, had permeated her child's immune system and were even present in his skin. This discovery coincided with the realization by Dr. Tom Starzl, pioneer transplant surgeon, that "microchimerism," the migration of white blood cells from the graft into the recipient, was an important feature of successful transplantation.

In 1995, we published our paper showing that maternal cells within the patient's blood and tissues were able to inhibit the growth of killer cells that would have otherwise attacked his mother's donated kidney. This inhibition coincided with a successful period of 7 years' abstinence from all immunosuppression. Although eventually, the kidney did succumb to a delayed rejection process, we learned enough from this experience to explore in depth the effects of neonatal exposure to maternal antigens in kidney transplantation. The result was a paper that appeared in the *New England Journal of Medicine* in 1998, documenting a tolerogenic effect of maternal antigen exposure on kidney transplant survival in siblings at nine transplant centers in Europe and North America. At the time that our paper was published, we were not actively supported by the NIH for our research efforts in this area. However, due to active support of the NIH beginning in 1999, my lab has been able to continue this research and develop animal models that enable us to explore basic mechanisms of maternal-fetal tolerance. How mother maintains a close relationship with the immune system of her baby, using stem cell transfer and oral tolerance via the nursing of the infant to establish microchimerism, and how microchimerism induces tolerance to a subsequent transplant in the adult, are subjects of ongoing research in my laboratory.

The decade of the 1990s was filled with remarkable discoveries regarding maternal and fetal relationships that changed many fundamental concepts of immunologic tolerance and

autoimmune disease. The work of Andrew Meller and David Munn established a tryptophan-depleting enzyme called IDO that was essential for maintaining normal pregnancy, a finding that has opened whole new areas of cancer immunotherapy research.

Dr. J. Lee Nelson and colleagues at Seattle firmly established a connection between fetal microchimerism in adult women who had given birth to sons earlier in life and the development of scleroderma, a disease of the skin and lungs that is often fatal in women. The immunologic balance that should normally be present allowing the persistence of cells from the baby in the mother without upsetting tolerance to self had broken down in these women and had led, in some way, to an aberrant reaction of the mother's immune system to her own tissues.

Recent work from Dr. Nelson's lab has established that chimerism in the opposite direction, from mother to child, can lead either to a disruptive presence in the immune system of the offspring predisposing to autoimmunity or can be part of a restorative repair process in a child with a genetic anomaly. The importance of maternal-fetal chimerism and tolerance has recently come to the forefront in the field of cancer research.

Work by Dr. Els Goulmy's lab in Leiden has shown that healthy individuals are predisposed to either aggressive or suppressive responses toward antigens to which they have been naturally exposed during pregnancy or gestation, and via nursing. In collaboration with Els, we found that the presence of microchimerism from mother or offspring could trigger a type of suppressive T cell, which turned out to be a hallmark of long-term tolerance to an organ transplant in a woman who lived for 42 years after receiving a kidney graft from her sister.

Maternal–fetal immunologic research has had a profound impact on our understanding of the development of the immune system. Most recently, work that was published in *Science* magazine in December 2008 highlighted the emerging field of human fetal immunology, showing that the fetal lymph node was, in fact, not at all a typical lymph node in the sense of a place for mobilization of defense against microbes, but was rather an immune, privileged site, designed to accommodate the presence of maternal cells in the offspring during gestation and throughout the birth process. This insight from Dr. McCune's lab in California has made it certain that researchers are going to discover new things about the waves of stem cell migrations and the developmental pathways that lead to mutual tolerance between mother and child. In 2007, Rachel Miller and colleagues reported that that immunization of mothers with influenza vaccine during pregnancy caused a transfer of immunity to the baby. These and other insights are all supported by the NIH and will play an important role both in women's health and the health of the baby, which will impact society in the long term.

Given that the healthcare system is increasingly under scrutiny for its lack of personalized medicine and over-reliance on prescription drugs, it seems an opportune time to consider the natural role of maternal–fetal cell exchanges in health and disease and to promote further research into the area of reproductive immunology. Grant support in the reproductive immunology field has the potential to impact immune tolerance, autoimmunity, transplantation, cancer, cancer immunity, and tissue regeneration. All of these areas, I think, have something to benefit from a continued focus on the natural immune acceptance between mother and baby in women's health research.

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Chronic Pelvic Pain: Common Pain, Uncommon Management

One in seven women will experience chronic pelvic pain (CPP) at some point in her life.[1] CPP can be defined as pain that has been stable in location and of at least 6 months' duration that localizes to the anatomic pelvis, anterior abdominal wall at or below the umbilicus, the lumbosacral back, buttocks, or the vulva.[2] Causes can be varied, including gynecologic, urologic, gastroenterological, neurologic, and musculoskeletal sources. (See Table 1). Women may have more than one source of pain. Although this may present as two unrelated primary disease processes, more commonly, secondary pain sources are due to chronic muscle spasm, surgical complications, neuroplasticity, or pain referral patterns. In 1996, Mathias et al. published the classic study of prevalence, quality of life, and costs of CPP in the United States.[1] This telephone survey to 17,927 households identified 5,325 households with at least 1 woman aged 18 to 50. Fourteen percent of women (773/5,325) reported in the past 3 months experiencing symptoms of pelvic pain with a duration of at least 6 months. Sixty percent of women noted that they did not have an established diagnosis. Women with CPP scored lower on quality-of-life scores compared to women in the survey without CPP. Further, respondents were asked about use of medical resources and missed work. Mathias estimated annual U.S. direct cost of physician visits to be $880 million and $555 million for lost work hours.

Women with CPP report significant problems related to their illness. They may have trouble working, carrying out tasks of daily living, and keeping up important relationships. Women worry about future fertility, an overlooked cancer diagnosis, or simply that the pain may become worse and they may not be able to handle it. Often their doctors will tell them that "it is all in your head" or "you are fine, don't worry about it." Women naturally think that if they rest, they might feel better, but long-term inactivity leads to muscle weakness and increased musculoskeletal pain, as well as potential weight gain and the health problems that go along with obesity. Pain can lead to problems of insomnia and depression. For women with chronic abdominal pain, suicidal ideation and attempts were two to three times more common than in those without pain.[3]

Best estimates indicate that many women with CPP will respond to traditional treatments, including medications such as nonsteroidal anti-inflammatory medications or birth control pills; and surgeries, from ablation of endometriosis to hysterectomy.[4] However, response rates vary widely depending on the patient population, underlying disease processes, and individual coping methods. Most surgical studies estimate failure rates of 10–40 percent. Medication failure rates can be even higher. In one CPP clinic, 6-year followup of all patients with all diagnoses found that 70 percent of patients had persistent pain symptoms.[5] It is important to note that patients who present to CPP clinics may have a more severe or complicated disease.

Further difficulties may arise as there are limited numbers of physicians who have an interest in caring for patients with CPP. It is widely accepted that a multidisciplinary approach, usually involving gynecology, physical therapy, behavioral therapy, gastroenterology, urology or urogynecology, anesthesia, acupuncture, and massage therapy is the most effective treatment

model.[6] Unfortunately, most patients do not have access to a multispecialty group with an interest in treating women with CPP. Many physicians feel uncomfortable caring for the complex patients with CPP who do not respond to basic treatments. Medical education about CPP tends to be limited, if it occurs at all.

Given the tremendous cost to individuals with CPP and to society, there is surprisingly little research on the best treatment options. There are a number of reasons why it is difficult to study CPP. Most significant may be the fact that most women with CPP have more than one source of pain. It is difficult to find a large enough group of women to study that all have the same diagnoses. Even in a busy CPP service, it is unlikely to see more than a few women at any given time with the same underlying conditions. Although it is possible to study women with multiple underlying causes for their pain, it may blunt the effects of the intervention, leading to a need for even larger sample sizes. Second, pain tends to wax and wane over time in most of these syndromes. This means that it is necessary to study interventions for at least 12 weeks to be able to pick up real improvements. And long-term followup is very important in a chronic condition. There is a significant placebo effect for many treatments, so future research will need to be placebo-controlled, especially surgical interventions. Studies may be complicated by high attrition rates, especially for treatments that are more time intensive or may have side effects. A multicenter database and research network would be crucial to improve evidence-based treatment recommendations.

Another clinical issue that needs further investigation is the use of opioid pain medications. There are ample data demonstrating that these medications improve pain scores for acute pain processes. There are no data supporting the use of opioids long-term in patients with CPP. Given the potential side effects ranging from gonadal dysfunction, constipation, and sedation, to potential addiction, and given the expense of these medications, data on pain scores and quality of life would be very useful. CPP providers recognize that patients have a right to have their pain treated, but also recognize that without data, it is hard to recommend these medications.

Further challenges include how little information we have on demographics and education. It has been almost 15 years since Mathias looked at the prevalence and impact of CPP in the United States. It is possible that there may be differences related to new treatments and to more Americans being uninsured. In Great Britain, Price looked at patients' attitudes to the CPP consultation.[7] Four major themes emerged as important in a successful consultation: wanting personal care, wanting to be taken seriously, wanting an explanation as much as care, and wanting reassurance. This type of needs assessment has not been performed in the United States, and would be valuable in developing treatment models. Further, there have not been assessments in the United States of the state of education in CPP for medical students or residents. Assessment of barriers that providers face when they manage women with CPP would also help in curriculum preparation.

Basic tools that need to be developed include residency and postresidency educational objectives for the management of CPP, a research definition of CPP, and a validated measurement tool for outcomes that are important to women with CPP.[8]

Clearly CPP is a major problem for women and for healthcare providers. There is a shocking paucity of research on demographics, patients' needs, educational needs and interventions, and treatment outcomes. I sincerely hope that you consider the scope of the problem, the significant impact on women with CPP, and the substantial cost of care when establishing future National Institutes of Health research priorities.

Table 1: Common Causes of Chronic Pelvic Pain

Gynecological:	**Urological:**	**Neurological:**
Endometriosis	Interstitial cystitis	Ilio-inguinal and ilio-hypogastric neuralgia
Pelvic adhesive disease	Urethral syndrome	Genito-femoral neuralgia
Ovarian cyst	Renal lithiasis	Pudendal neuralgia
Pelvic inflammatory disease	Neoplasm	Chronic regional pain syndrome
Dysmenorrhea	**Gastroenterological:**	**Musculoskeletal:**
Adenomyosis	Irritable bowel syndrome Inflammatory bowel disease Intestinal endometriosis Abdominal hernias Diverticular disease Colorectal carcinoma Chronic appendicitis Ischemic bowel	Fibromyalgia
Pelvic congestion		Pelvic floor myalgias Coccygodynia
Leiomyomata		Abdominal wall trigger points
Cervical stenosis		
Gynecologic malignancy		
Pelvic organ prolapse	Infectious enterocolitis Proctalgia fugax	
Vulvodynia		

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FRANCOIS LUKS, M.D., PH.D.

The Warren Alpert Medical School of Brown University Program in Fetal Medicine

The Future of Fetal Therapy

We represent the Fetal Treatment Program, a multidisciplinary initiative that comprises more than 15 divisions and departments in two hospitals (Women & Infants' Hospital and Hasbro Children's/Rhode Island Hospital) and the Alpert Medical School of Brown University. The Fetal Treatment Program offers advanced therapy and support to the small portion of fetal patients that requires complex care, sophisticated collaboration between multiple services, and prolonged followup through the perinatal and neonatal period. This also includes invasive fetal therapy and fetal surgery. The Fetal Treatment Program is one of a small but growing group of such initiatives around the country. We are a founding member of the North American Fetal Therapy network, or NAFTNet, and we were an invited participant at the National Institutes of Health (NIH) Workshop on "Fetal Treatment: Needs Assessment and Future" in 2004. Ours was one of three fetal therapy program structures to be offered as national models. We have more recently acted as reviewers for technical briefs on Fetal Surgery for the Agency for Healthcare Research and Quality (AHRQ). We feel justified, therefore, in offering our recommendations regarding the future of fetal therapy and its place in the overall strategy for women's health research priorities for the NIH in the coming decade.

Fetal therapy is at an important crossroads. Whereas a decade ago, in-utero surgical intervention was semi-experimental and limited to less than a handful of specialized centers, there has been an explosion in the number of institutions offering this treatment and a rapid rise in the number of patients undergoing fetal surgery. While the early difficulties associated with such a new and perilous form of therapy and the high visibility of its pioneers provided some safeguards, the multiplication of fetal treatment centers around the country and the world has occurred virtually unchecked and without many guidelines. Oversight of fetal therapy is further complicated because it crosses disciplines, making specialty societies less able to provide enforceable directives. Furthermore, the makeup of each fetal therapy center often reflects local expertise, specific disorders that are being treated, referral patterns, and historical relationships between subspecialists. As a result, many different models of fetal therapy centers coexist. Our own Fetal Treatment Program has always prided itself in being truly interdisciplinary, based on

mutual respect and the goal to use the various strengths of each discipline to create an optimal approach to fetal therapy. Given the current trends in fetal medicine, we urge the NIH to take a leading role in developing guidelines for fetal therapy, and invasive fetal treatment in particular, that stress this collaborative environment. The Maternal-Fetal Medicine Network and Neonatal Network initiatives of the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) have shown the benefits of NIH-directed merit-based participation in multicenter research. In the next decade, a similar initiative to regroup the most academic fetal therapy centers must be undertaken at the NIH level. Such an effort has already been started on this continent (the NAFTNet initiative, which directly followed the NIH consensus conference in 2004), and was initiated more than a decade ago in Europe (Eurofoetus).

The convergence of diagnostic accuracy in detecting fetal disorders and the technological advances that have made fetal intervention possible is unprecedented. Fetal therapy may still be a relatively rare occurrence, but it certainly is a new medical discipline. Just as the advent of neonatal intensive care units paved the way for the multidisciplinary care of the premature infant, its unborn counterpart can now benefit from greater knowledge and greater therapeutic opportunities to be considered and treated as a full patient. Because this is a relatively new development, however, current paradigms may not be ideally suited for this interdisciplinary approach. It is imperative, therefore, that the next generation of medical professionals be exposed to this new discipline. At the Alpert Medical School of Brown University, we have, for the past 6 years, offered a course in multidisciplinary fetal medicine with a faculty that crosses specialties. While this initiative has received accolades, it is still one of very few such initiatives in the country. We would urge the NIH to support innovative and effective educational programs that reflect the current status of fetal medicine at the undergraduate, graduate, and postgraduate levels.

Because fetal therapy, by definition, only affects a very small minority of fetuses and pregnancies, it runs the risk of being bypassed as limited resources force the NIH to prioritize its budgets. The Food and Drug Administration already provides some solace through its Orphan Disease funding programs. However, these funds are insufficient and further marginalize rare disorders into competing against each other for attention and financial support. We understand that the difficulties arising from several recent fetal therapy grants, such as the twin-to-twin transfusion study, the congenital diaphragmatic hernia study before that, and the still-ongoing Management of Myelomeningocele Study, have reduced the NIH's enthusiasm to fund future fetal surgery studies. Nevertheless, there remain substantial gaps in our knowledge of these conditions, even as the technical aspects of fetal intervention have improved. Endoscopic fetal surgery has become an accepted form of treatment for severe twin-to-twin transfusion syndrome, but patient selection remains very difficult, in part because of our lack of understanding of the pathophysiology of the disease. As a result and despite many clinical trials, outcome after fetal intervention is not much better than it was 10 years ago. For the next decade, we propose an increased effort into basic science research of placental vascular anomalies in twin gestations and other poorly understood fetal conditions.

Limited as the impact of fetal therapy studies may be within a wider public health context, their results can also have far-reaching spinoff effects on other diseases and conditions. Two decades of research into the technical aspects of open and endoscopic fetal surgery, itself a consequence of laparoscopic surgery developments, have advanced our knowledge and expertise in such areas as miniaturized endoscopy, ultrasound-guided interventions, management of preterm labor, and fetal lung development, all of which may ultimately benefit millions of Americans. Furthermore, research into epigenetics and fetal programming are unraveling the fetal origins of adult diseases. Recent studies emphasize the role of fetoplacental stress and the intrauterine environment on a variety of conditions of public health significance, including heart disease, diabetes, and obesity. Clearly, fetal medicine research does not exist in a vacuum and must become an integral part of public health policies and research planning.

Fetal medicine, and fetal therapy in particular, remain fringe specialties, although their presence is growing very rapidly. It is important, therefore, that the following be undertaken:

1. Guidelines and benchmarks be established, with particular attention to the interdisciplinary nature of this discipline
2. Medical education and postgraduate training reflect the rapid changes in fetal medicine
3. Despite current budget limitations, research funding for fetal medicine and fetal therapy initiatives not be ignored

We feel that the National Institutes of Health can, and should, play a major role in all three of these endeavors.

Public Testimony
Northwestern University School of Medicine
Chicago, Illinois
October 14, 2009

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Autoimmune Diseases: A Major Women's Health Issue

Introduction

As a disease category, autoimmune diseases are currently the eighth largest cause of death in women from the ages of 16 to 64. While these diseases do affect men also, the ratio is highly disproportionate with autoimmune diseases affecting women 78 percent[1] more often than men. By age 50, 1 in 10 to 1 in 20 women will have an autoimmune disease.[1]

According to the National Institutes of Health (NIH), 23.5 million Americans are suffering from some form of autoimmune disease, of which there are more than 80. These include lupus, type 1 diabetes, celiac, multiple sclerosis, and Crohn's disease. Autoimmune diseases can affect every system in the body. While all are connected by the common thread of autoimmunity, their symptoms vary widely from disease to disease and often within a single disease as well, making them difficult to diagnose and often overlooked until the damage has become terminal or has irreversibly affected a patient's quality of life.

Today, too little is known about autoimmune diseases and their common pathogenesis of autoimmunity. As the NIH and the Office of Research on Women's Health (ORWH) explore areas of the greatest concern for women, the American Autoimmune Related Diseases Association (AARDA) implores you to include autoimmune diseases as one of your primary platforms for future research and exploration.

While there is a fundamental need for increased research across the board for the general pathogenesis of autoimmunity that connects these more than 80 diseases, AARDA particularly would like to see increased evaluation and research in the following areas:

1. Current research tells us that autoimmune diseases are on the rise in the United States, as well as around the world. More work needs to be done to investigate the cause of such increases, such as genetic predisposition and environmental triggers.
2. Consistently, autoimmune diseases continue to be a major health concern for women at a higher incidence than for men, and too little is known about why women are affected at such disproportionate numbers.
3. Much more work needs to be done to investigate another disparity of why certain autoimmune diseases, especially among women, affect minority populations at higher rates as well as higher levels of severity than are experienced by other populations.
4. More research and investigation are needed to analyze pregnancy, infertility, and lactation as they relate to autoimmune diseases as well as the relationship of endocrine disorders and autoimmune diseases.

Autoimmune Diseases on the Rise

According to several studies conducted in the United States and around the globe, the incidence of many autoimmune diseases is rising. A study titled, *Incidence of polymyositis-dermatomyositis: A 20-year study of hospital diagnosed cases in Allegheny County, PA 1963–1982,* showed the incidence of polymyositis-dermatomyositis more than tripled during this time period, and notably the most substantial increase took place amongst African-American women.[2] In another study, *Increasing prevalence and incidence of multiple sclerosis in South East Wales,* the prevalence of multiple sclerosis was found to have increased 45 percent over the past 20 years. Additionally, a study found that the overall incidence of systemic lupus erythematosus had increased twofold over a comparable study done in New York City 15 years ago.[3] In Finland, type 1 diabetes has more than doubled in the past 30 years;[4] and in the United States, a Mayo Clinic study found that celiac disease today is more than four times more common than it was 50 years ago.[5]

This growing trend should be of great concern because while there is revealing evidence that autoimmune diseases are increasing in frequency, still very little is known as to why. Compelling past research has shown that autoimmune diseases may be on the rise due to triggers in our environment in those who have a genetic predisposition to the development of autoimmune diseases.

Genetic Predisposition and External Triggers

All autoimmune diseases are genetically interrelated, tending to cluster in individuals and families. An individual's susceptibility to autoimmune diseases is determined by his/her set of genes. However, studies on identical twins show only a 30-50 percent concordance in autoimmune disease expression. Therefore, genetic makeup alone does not determine whether someone will "get" an autoimmune disease. There are other risk factors, external to the body, involved in initiating and exacerbating the disease process.

As we have shown through current research trends, it is a common belief that autoimmunity is, in fact, on the rise. While one-third of the risk of developing an autoimmune disorder lies in one's genetic makeup, the remaining causes are thought to be non inherited and may contain several environmental factors. For example, exposure to certain metals, such as mercury, gold and silver, are thought to induce lymphocyte proliferation and subsequent autoimmunity.

While our current understanding of the role that environmental factors play in the autoimmune attack remains rudimentary, a wide range of triggers have been implicated in autoimmune disease expression, including the following:

- Viral and infectious agents
- Broad groups of chemicals
- Heavy metals
- Iodine

- Organic compounds (including PCBs and estrogenic compounds)
- Phthalates
- Pharmaceuticals
- Pesticides
- Some foods such as cow's milk
- Ultraviolet radiation

More research in this area is required to fully understand this relationship, which affects millions of Americans at an increasingly higher rate each year. It is imperative that we understand the full range of environmental triggers and the role they play in the autoimmune process. Understanding how environmental factors fit into the autoimmune attack puzzle may provide approaches to preventing these diseases or reducing their severity. This is certainly more desirable than trying to control an ongoing autoimmune attack with immunosuppressive drugs that expose patients to many well-known serious side effects.

AARDA, therefore, strongly recommends to the ORWH/NIH that a coordinated research program be initiated to better understand the role of environmental triggers across the family of autoimmune diseases. The ultimate goal of this program is the development of approaches to prevent autoimmune diseases or decrease their severity, thereby minimizing the very serious financial and societal burdens they place on our healthcare system and on afflicted individuals and their families.

Women and Autoimmunity

Autoimmune diseases affect women disproportionately more often than men, some as high as 9:1.[6] Although there has been some research into sex bias differences in autoimmune disorders, there is no substantial research into this area. It is commonly thought that hormones may play a significant role in the unbalanced nature of the diseases in women in comparison to men. For example, many autoimmune diseases seem to occur more often in women who have completed menopause, while other disorders may significantly improve during pregnancy with no outward provocation. Although these findings seem to point to an obvious link, the role of hormones in autoimmune disorders has not been conclusively proven. Recent findings indicate a need for more research concerning pregnancy influences on the incidence and natural history of autoimmune diseases.

Hormones, Women, and Autoimmune Diseases

Women are affected by autoimmune diseases 75 percent more often than men, and while this is common knowledge, still very little is known about why. Sex hormones, including estrogen, prolactin, and testosterone, all have been found to play an important role in triggering these diseases. While researchers have some understanding that hormones like estrogen can enhance autoimmunity and have various effects on the immune system, its behavior in response to certain autoimmune diseases is not linear.

For example, one study found a small increased risk of mild/moderate flares in women with systemic lupus erythematosus (SLE) who were taking hormone replacement therapy (HRT). However, there seems to be no increased risk of major flare ups in SLE patients taking HRT. In addition, in patients with rheumatoid arthritis, HRT is not associated with an increased risk of disease flare and may actually improve disease activity.[7]

Additionally, another study analyzed the effects of prolactin production in breastfeeding women. Persistent mild to moderate elevations in serum prolactin were found to have been the cause of a break in self-tolerance in female mice, showing a possibility that women producing prolactin could be at risk of overactive autoimmunity.[8]

Additionally, some autoimmune diseases have been shown to improve during pregnancy, while others show significant flares after pregnancy. For example, women with autoimmune disease who become pregnant can induce amelioration of the mother's disease, such as in rheumatoid arthritis, while exacerbating or having no effect on diseases like systemic lupus erythematosus (SLE).[9]

Clearly, hormones have a role to play in the triggering of an autoimmune reaction that leads to an autoimmune disease. Because of the overwhelming disproportionate ratio of women to men in autoimmune diseases, in women it is imperative that more work be done in research to uncover how these diseases are being triggered and what we can do to inhibit those reactions.

Endocrine Disruptors and Autoimmune Disease

Further evidence that hormones may play a major role in the increased incidence of women with autoimmune diseases lies in data that suggest endocrine disruptors affect both the reproductive system and the immune system; this is according to the study, *Endocrine Disruptors (Environmental Estrogens) Enhance Autoantibody Production by B1 Cells.* The results of this study indicate that endocrine disruptors are, in fact, involved in autoantibody production by B1 cells and may be an etiologic factor in the development of autoimmune diseases. Endocrine disruptors such as bisphenol-A (BPA) enhance autoantibody production by B1 cells both in vitro and in vivo.[10]

In addition, another commonly found endocrine disruptor, diethylstilbestrol (DES), has been linked to increased levels of arthritis and lupus where there has been prenatal exposure to DES leading to immune impairment. In general, research has found that women prenatally exposed to DES appear to have a higher incidence of autoimmune diseases when various autoimmune diseases are grouped (S. Ansar Ahmed). Since DES has most commonly been prescribed for women to treat gonorrheal vaginitis, atrophic vaginitis, menopausal symptoms, and postpartum lactation suppression to prevent breast engorgement, there is ample evidence that it has led, in part, to the disproportionate nature by which women develop autoimmune diseases.[11]

As autoimmune diseases increase in the U.S. and around the world, this problem requires an increased level of research and investigation into known hormonal triggers such as BPA and DES.

Infertility and Autoimmune Diseases

Autoimmune disease is a major cause of pregnancy loss and infertility among women in the United States. Studies have investigated many of the factors surrounding infertility and autoimmune diseases, such as antiphospholipid antibodies, antithyroid antibodies, antinuclear antibodies, antisperm antibodies, and antiovarian antibodies. Antiphospholipid antibodies and recurrent pregnancy loss is an established connection with treatment options available for women; however, much work is still needed to analyze this as well as other autoimmune factors and their repercussions for infertility, pregnancy loss, and in vitro fertilization.

One study, *Antiphospholipid syndrome and recurrent miscarriages*, posits that 7-25 percent of recurrent spontaneous abortions (RSA) can be accounted for by antiphospholipid syndrome (APS) as the main risk factor. Additional studies have found that APS is not only associated with RSA, but also with infertility. New mechanisms are described in this study by which antiphospholipid antibodies (aPLs) could cause placental thrombosis and infarction, acting directly on the surface anticoagulant expressed on trophoblastic cells. It was found that testing for additional aPLs remains an important objective to understanding their role in RSA.[12]

Another study analyzing the role of antiphospholipid antibody–mediated recurrent pregnancy loss has shown that there is an evident association in both humans and murine models. The study found that pregnancy loss could result from diverse autoimmune factors, such as inflammation, involving different mechanisms that encompass pathogenic anti-PL Abs.[13]

When analyzing whether there is a role in autoimmunity in implantation failure after in vitro fertilization, scientists found that antinuclear antibodies may be a marker for underlying autoimmune disease when coupled with certain signs and symptoms. Additionally, the study found that antisperm antibodies are associated with fertilization failure when found in high titers in seminal plasma, in sperm, or in the mucosal immune system of women. Antisperm antibodies are uncommon generally; however, they are most often associated with ovarian hypofunction.[14]

Clearly, there is a fundamental role played by autoimmunity in the infertility and pregnancy loss of women, and more work needs to be applied here by ORWH to explore further what these and other studies of their kind are beginning to discover. A study titled, *Bidirectional effects on autoimmunity and reproduction,* came to the following conclusion, which AARDA fully agrees with: "Integration of mechanistic and clinical information by multidisciplinary teams is needed to manage reproductive issues in women with autoimmune diseases."

Autoimmune Diseases in Minority Populations

Another area of increasing concern that has been under-studied and under-analyzed is the question of why some minority populations are disproportionately affected by certain autoimmune diseases. For example, research has shown that lupus nephritis is found to be more common and have increased levels of severity in African-American women. Additionally, despite aggressive immunosuppressive therapies employed in lupus nephritis in this patient population, there is also a higher incidence of progression to end-stage renal disease, according to a study, *Lupus nephritis in African-Americans*.[15] Factors such as genetics

have been found to play a role in explaining why African-Americans appear to be at higher risk for lupus nephritis.

Research supported by NIH found that African-Americans were more likely to have a less efficient Fc receptor gene. This work will greatly increase the ability of scientists to begin studying ways to better predict those who have a higher level of susceptibility to lupus nephritis. This is an area where additional research could lead to viable options for treatment and early detection. In addition to the genetic finding surrounding lupus nephritis in African-Americans, still more work is necessary, as autoimmune disease often must be triggered even in those with proven genetic predisposition, and too little is still known about those triggers. Further study in this area may also help explain the severity levels of African-Americans with lupus nephritis.

In a recent study, *Nursing home residents with multiple sclerosis (MS): Comparisons of African American residents to White residents at admission,*[16] it was found that African-American patients admitted to nursing homes with MS were found to be significantly younger, had a higher degree of cognitive impairment, and were considerably more physically disabled. The study also found that while the differences in the White and African-American MS populations were vastly different in severity; there was no notable difference in the use of various therapies provided by quality therapists. The outcomes of this study require a great deal of additional research that AARDA compels the National Institutes of Health to support. More research and collaboration is needed in the areas of genetics, immunology, epidemiology, and virology to determine the pathophysiology of MS and its possible different effects on minority populations. Additionally, further research could uncover a possible need for outreach into the African-American community for disparities in MS-related care, increasing treatment outcomes for this population.[16]

While we have demonstrated two very specific scenarios in which disease outcome varies by race in both lupus nephritis and MS, we believe that this is an area that requires more attention. Both the above studies are further examples of the need to fully develop new and innovative tools to treat disease, such as personalized medicine. Further research into locating and chronicling disease biomarkers in patients, helping us to better predetermine treatment outcomes for a various number of human populations, could be the key to closing some of the racial disparities in treatment for autoimmune diseases.

Autoimmune Disease Biomarkers

NIH should focus considerable efforts into research on biomarkers for the more than 100 autoimmune diseases. There is a critical need for the creation of a database of autoimmune disease biomarkers. This database would assist in tracking the relation of biomarkers to disease severity. In addition, there is a need to develop a differential diagnosis technique to use groups of biomarkers to determine the presence of specific autoimmune diseases. The last item is based on the concept that autoimmune diseases can be determined by looking for groups of biomarkers as though they were chords played on a piano. There is also a need to expand autoimmune disease research to include the relationship between these diseases and other serious health conditions.

Awareness Through Education

Lastly, we recommend that the NIH Office of Research in Women's Health sponsor a cross-institute scientific meeting to examine the latest in research on the issues discussed above in order to identify additional areas of opportunity in autoimmune disorders research.

About the American Autoimmune Related Diseases Association

The American Autoimmune Related Diseases Association is dedicated to the eradication of autoimmune diseases, alleviation of suffering, and socioeconomic impact of autoimmunity through fostering and facilitating collaboration in the areas of education, public awareness, research, and patient services in an effective, ethical, and efficient manner.

AARDA is the only national nonprofit health agency dedicated to bringing a national focus to autoimmunity, the major cause of serious chronic diseases. Approximately 50 million Americans, 20 percent of the population or 1 in 5 people, suffer from autoimmune diseases. Women are more likely than men to be affected; some estimates say that 75 percent of those affected—some 30 million people—are women. Still, with these statistics, autoimmunity is rarely discussed as a women's health issue.

Autoimmunity is a result of a misdirected immune system that causes one's own immune system to attack the self. There are more than 80 known autoimmune diseases, and unlike the many forms of cancer that are recognized as being part of the general term "cancer," autoimmune diseases are recognized singularly rather than in the overall category of autoimmunity. The public in general is unaware of the autoimmune nature of these diseases. When most people hear one of these diseases referred to as an autoimmune disease, they incorrectly confuse the term autoimmune with acquired immune deficiency syndrome (AIDS), or they think it is a form of cancer.

This lack of knowledge and collaborative effort results in untold suffering for persons with autoimmune diseases due to misdiagnosis and delayed diagnosis, which may result in damage to vital organs. The need to bring a national focus to autoimmunity as the common factor in all autoimmune diseases is vital in order to bring a collaborative effort to research, funding, early detection, and eventually, prevention and cure for all autoimmune diseases.

Some of the more than 80 autoimmune diseases are lupus, type I diabetes, scleroderma, celiac, multiple sclerosis, Crohn's disease, autoimmune hepatitis, rheumatoid arthritis, Graves' disease, myasthenia gravis, myositis, antiphospholipid syndrome, Sjögren's syndrome, uveitis, polymyositis, Raynaud's phenomenon, and demyelinating neuropathies.

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American Psychological Association

Written Statement From the American Psychological Association (APA) and the APA Committee on Women in Psychology: Moving Into the Future—New Dimensions and Strategies for Women's Health Research

On behalf of the 150,000 members and affiliates of the American Psychological Association (APA), we thank you for holding this important series of hearings to discuss ways to update the research agenda of the Office of Research on Women's Health (ORWH).

APA is the largest scientific and professional organization representing psychology in the United States and is the world's largest association of psychologists. Composed of researchers, educators, clinicians, consultants, and graduate students, APA works to advance psychology as a science, a profession, and a means of promoting health, education, and human welfare.

APA acknowledges the important role of ORWH and its founding director in spurring interest in women's health research. It is of paramount importance to promote women's health. Through the years, advocates have focused on many critical issues in women's health, including access to health care, health promotion across the lifespan, violence against women, gender-based research, and mental health. In addition, advocates and researchers have recognized that due to health inequities, women across various racial and ethnic groups, lesbian, bisexual, and transgender women, women with disabilities, and low-income women are bearing a disproportionate burden of disease; therefore, special attention is warranted for these populations.

APA views ORWH as a valued partner and applauds the behavioral research that ORWH has funded or cofunded since its inception. Themes given emphasis in the Office's Fiscal Year 2009 priorities strike a resounding chord. APA particularly applauds the lifespan perspective and emphasis on quality of life.

Women have traditionally experienced lower earning power than men, with a current gender gap of 23 percent.[1] This has resulted in a disproportionate number of women who are economically disadvantaged. Access to care is a key factor contributing to poorer health outcomes in economically disadvantaged individuals.[2] Therefore, research that contributes to public policy changes by eliminating barriers to care in women with low socioeconomic status will have a significant impact in terms of facilitating health promotion in all women.

Health promotion for women includes attention to the entire spectrum of a woman's life.[3] During early childhood, health depends on proper nutrition and physical activity, immunizations, and the prevention of conditions, including osteoporosis and skin cancer. As girls move into the teen years and early adulthood, awareness, prevention and treatment for sexually transmitted infections (STIs), human immunodeficiency virus (HIV), acquired immune deficiency syndrome (AIDS), tobacco use, substance abuse, and violence become a concern.

Women's health needs change upon entering midlife. The management of cardiovascular and other chronic diseases is essential, as is screening for and knowledge about cancer, diabetes,

and a number of other important health conditions.[4] Throughout a woman's lifespan, mental health services greatly affect her overall health, as well as access to prescription drugs, long-term care facilities, and community-based care services during the later years of womanhood.

We strongly support efforts made to educate women to be partners in their health and wellness, defined to include wellness in emotional, social, environmental, physical, intellectual and spiritual realms.

Violence against women has become a global social epidemic that demands our attention through research and intervention. There is a growing body of evidence that indicates that gender-based violence is a risk factor for multiple physical, mental, reproductive, and psychosomatic disorders affecting women. Physical consequences include homicide, injuries during pregnancy, serious injuries, and vulnerability to disease. The psychological consequences are grave, ranging from suicide, depression, anxiety, posttraumatic stress disorder, eating disorders, and chemical dependency.[5–7]

Additionally, the costs to society are significant. Direct costs include those incurred by police, courts, and legal services to prosecute perpetrators; the costs of treating offenders; the medical and mental healthcare costs of treating sexually and physically abused women; social service costs, including child protection services; and the loss of productivity and employment by abused women. To address this, APA recommends that ORWH partner with other Institutes and Centers, including the National Institute of Mental Health (NIMH), the National Institute on Aging, the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), and the National Institute of Nursing Research, to help prevent and eliminate violence against women and address the ongoing patriarchal systems that institutionalize women's diminished worth.

The recognition that women's health outcomes vary according to race and ethnicity has brought with it an increased effort on the part of the National Institutes of Health (NIH) to address these inequities.[8] We applaud these efforts and would like to see these sustained and expanded. We especially encourage additional grant mechanisms to support research at the community level with marginalized populations, including the use of novel, community-based, non-mainstream methodologies. We also support research studies focused on the cultural and conceptual aspects of health literacy and how these aspects are related to health promotion and health outcomes in women.

This research is certainly relevant to healthcare reform discussions and to women who tend to make healthcare decisions for their families.[9] We recognize that at the NIH the number of studies examining health literacy and health disparities vary widely by Institute, and we encourage greater attention to mental health disparities, especially in marginalized and medically underserved populations.

We also acknowledge that there has been a dearth of studies conducted with populations who have diverse sexual orientations. The lack of funding for large-scale studies with this population has significantly hampered efforts to promote the health of lesbian, bisexual, and

transgender women. Other populations traditionally neglected in research that should be a focus in future studies include American Indian women and immigrant populations (e.g., Asian and Pacific Islander [API] and Latino populations). A greater focus on API and the Latina population is consistent with demographic projections of a dramatic population growth for both populations, particularly at certain age ranges.[10]

Gender-based research is also critical to the promotion of women's health. There are women who may react differently than men to certain medications, yet often medications are tested on men. Women may also be more vulnerable to certain diseases, have different symptoms from men, and may respond differently to various diagnostic procedures. A focus on inclusion of women in clinical trials and on research to understand how biological differences affect health outcomes is warranted. ORWH is encouraged to participate in research designed to improve and/or assess the external validity in randomized clinical trials so that sampling, recruiting participants, and interpreting results of clinical trials important to women's health may be improved.

Furthermore, postpartum depression (PPD) is a serious mental health problem that can have significant consequences for both the new mother and family. For mothers, PPD can affect their ability to function in everyday life and increases their risk for anxiety, cognitive impairment, guilt, fear, sleep disturbance, and thoughts of hurting oneself and one's child. Additionally, PPD may lead to difficulty in providing developmentally appropriate care to infants. As a result, children of mothers with PPD may experience problems in cognitive, social, and emotional development and have a higher risk of anxiety disorders and major depression in childhood and adolescence. APA supports research on the causes, differences among racial and ethnic groups, and treatments for PPD and encourages ORWH to seek opportunities to collaborate on this issue with NIMH and NICHD.

In closing, the American Psychological Association would like to thank you for the opportunity to share our comments related to women's health. We appreciate the NIH's ongoing commitment to women's health and look forward to serving as a resource and partner as you work on this and other important issues affecting women's physical and psychological well-being.

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DEE FENNER, M.D.

American Urogynecologic Society

Importance of Supporting Research into the Causes and Treatment of Pelvic Floor Disorders

The American Urogynecologic Society (AUGS) appreciates the opportunity to provide information to the Office of Research on Women's Health (ORWH) on the importance of supporting research into the causes and treatment of pelvic floor disorders. AUGS is a healthcare organization composed of clinicians and scientists dedicated to advancing research, education, and patient care in pelvic floor disorders, a common but largely neglected and untreated constellation of disorders that disproportionately affects women.

Pelvic floor disorders are a hidden epidemic. Women are reluctant to report symptoms, and providers are reluctant to ask about them. Urinary and anal incontinence and pelvic organ prolapse are conditions accompanied by shame and embarrassment; and, although they do not kill, they have a significant impact on women's lives. Women with incontinence are known to have increased rates of depression, avoid work and social contact, as well as intimacy. A recent report from the Pelvic Floor Disorders Network, funded by the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), and published in the *Journal of the American Medical Associatio*n (JAMA), found that pelvic floor disorders commonly impact American women. The authors surveyed community-dwelling women and defined disease to include women with only moderate to severe symptoms. Despite rigorous definitions, 16 percent of women reported moderate to severe urinary incontinence; 9 percent reported fecal incontinence; and nearly 3 percent had symptoms of severe pelvic organ prolapse. Increasing age leads to increasing prevalence, with half of all women over 80 affected. Of those women with pelvic floor disorders, 1 out of 11 women will have symptoms severe enough to choose to undergo surgical treatment, and of those who choose surgery, 1 in 3 will have a second surgery. Nearly all pelvic floor disorders are amenable to

nonsurgical management; however, little data exists to guide clinical decision making. Exception to this includes a recent report in the *New England Journal of Medicine* that demonstrated that weight loss resulted in a 47 percent drop in weekly incontinence episodes, confirming that weight loss can be considered a first-line treatment for women with incontinence. Women deserve choice of treatments and better understanding of these common conditions; to make this a reality, increased research funding is urgently needed.

There are four key areas where we believe increased funding for research could identify treatments and prevention strategies that would yield better outcomes and care for women who suffer from pelvic floor disorders. AUGS believes significant investment should be granted to research on pelvic floor disorders and is committed to ensuring that these investments would be well spent and would yield better patient outcomes.

Stress Urinary Incontinence

Of all pelvic floor disorders, urinary incontinence is the most common. Improvements in surgical treatment of urinary incontinence will improve the quality of life for American women and reduce associated healthcare costs. Surgery for treatment of stress urinary incontinence (SUI) is common and increasing, with 135,000 surgical procedures performed in the United States annually, an approximately 45 percent increase from 1988.[1] Ongoing efforts to select the most appropriate initial surgery and comparative trials to compare surgical therapies to nonsurgical treatments, including pelvic floor exercises, pessaries, and behavioral therapy are needed.

Approximately 10-40 percent of women have recurrent or persistent SUI after a continence procedure, and therefore, reoperation rates after surgery for urinary incontinence are high.[2,3] Few data are available to guide surgical treatment of recurrent or persistent SUI, although it is commonly accepted that repeat continence procedures are associated with lower success rates than primary surgeries and that failure rates increase over time.[4-6] Surgical trials are urgently needed to guide the care of women with persistent or recurrent SUI.

The NIH has invested in comparative effectiveness trials for women with uncomplicated SUI. The National Institute of Diabetes and Digestive and Kidney Diseases funded Urinary Incontinence Treatment Network recently reported in the SISTER Trial that cure rates after continence surgery are considerably lower than previously reported.[7] Unfortunately, only a small minority of women in this trial had undergone a prior continence surgery: 13 percent in the sling group and 15 percent in the Burch group. A second comparative effectiveness trial has just completed enrollment, but given the similarity in inclusion/exclusion criteria, it is likely that the network will enroll a similar percentage of women with recurrent or persistent SUI after a prior continence procedure, and it will also fail to provide data to guide clinical decisionmaking in women who have failed a first surgery. Therefore, despite the high urinary incontinence prevalence rates and high reoperation rates, there are no adequately powered randomized trials investigating the optimal method for treating SUI in this population of women. Without advanced understanding of the consequences and optimal surgical strategies for SUI, treatment in this important area of women's health is advancing slowly.

Prolapse Surgery

Three to 6 percent of women will develop pelvic organ prolapse during their lifetime, with half reporting significant impact on her quality of life.[8] Surgical therapy is the gold standard for the treatment of pelvic organ prolapse and is the main indication for hysterectomy in women over the age of 50. In 1997, approximately 225,000 surgeries were performed for pelvic organ prolapse in the United States with a direct cost of $1.12 billion.[9] Of women who choose surgery for treatment of their prolapse, one-third will have a second surgery.

While numerous surgical options are available, few comparative trials have been performed to determine the best surgery for primary or recurrent prolapse. In a recent Cochrane review, only 22 studies with fewer than 3,000 evaluable patients compared the effectiveness of different surgeries for pelvic organ prolapse.[10] Many more studies with adequate power are needed. In particular, randomized trials with adequate long-term followup that access indications, cure, risks for failure, and complications are drastically needed. In addition to surgical therapies, prolapse can also be treated with the use of pessaries. To date, a single trial has compared two types of pessary and no trials compare nonsurgical to surgical management of women with prolapse. Increased funding into both surgical and nonsurgical treatments for prolapse will allow women to make informed decisions regarding their care.

Randomized Trials and Mesh Registry

In an attempt to improve surgical repairs of pelvic organ prolapse, many surgeons use vaginally placed mesh to attempt to strengthen native tissues. Little data exist to support this treatment option, yet its use is growing in popularity, in part driven by the medical device industry. In November 2008, the Federal Drug Administration issued a warning regarding the use of these permanent mesh materials in response to a large number of complications reported on the MAUDE Web site, a voluntary reporting system for mishaps with medical devices.

Research dollars are needed to support randomized surgical trials, as well as the development of clinical registries to accurately report surgical mesh use, as well as its complications. Establishing a national registry is a huge undertaking and one that cannot be done by one organization alone. AUGS would like to work with NIH and partner with the Food and Drug Administration and the Centers for Medicare and Medicaid Services (CMS) to create a mesh registry that accurately reports use and outcomes with novel surgical devices so that unnecessary harm to women does not occur.

Prevention of Pelvic Floor Disorders

While data are sparse that guide clinical decisionmaking in the treatment of pelvic floor disorders, even less is known regarding the prevention of these problems as well as simple health care measures that women can implement to prevent their development. While pelvic floor exercises (aka “Kegels”) are commonly proscribed to young women, little to no data support their use as a prevention strategy. Research funding is urgently needed to not only better understand the causes and treatments of pelvic floor disorders, but also to find prevention strategies for these common problems.

Conclusion

AUGS sincerely appreciates the support many of our members have received from the NIH and the work we have been able to accomplish with government supported grants. Millions of women are impacted by pelvic floor disorders. Rigorous research is needed to determine best practices and therapeutic options for these life limiting disorders. Thank you for your attention to our requests and this important area of research in women's health.

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Amigas Latinas

Disparities in LGBTQQ Women's Health

This testimony is presented on behalf of Amigas Latinas (AL), a not-for-profit organization located in Chicago, IL. Over the past 12 years, Amigas Latinas has established itself as a vibrant and visible organization that advocates for Latina lesbian, gay, bisexual, transgender, queer, and questioning (LGBTQQ) communities in Chicago. Through sustained programming, leadership development, and advocacy, AL works to educate and empower Latina LGBTQQ women, as well as to educate service providers, the Latino community, the mainstream gay community, and legislators about the issues relevant to the Latina LGBTQQ community. As part of this effort, AL conducted the ground-breaking Proyecto Latina (PL) survey, which is the first project of its kind in Chicago to provide critical information about a community that has been ignored in research and scholarship for far too long.

Studies that specifically focus on examining the lives and challenges of Latina LGBTQQ women are practically nonexistent. The scarce literature that does exist reveals that this population is underserved and neglected in research studies and publications throughout the Nation. In recent years, there has been an increase in data on Latinos and on LGBTQQ lives and experiences. However, the data are primarily about White gays and lesbians, and among Latino publications, the experiences of LGBTQQ women are often ignored. In 2006, responding to this lack of information, the board of directors of AL initiated the Proyecto Latina: Descubriéndonos Survey Project in order to document and make visible the unique experiences of Latina LGBTQQ women in the Chicago metropolitan area.

Having run from January 12 through July 30, 2007, The Proyecto Latina: Descubriéndonos survey project involved the distribution of an extensive survey tool (299 questions) available in English and Spanish. The objectives of the survey project were as follows:

- Assess the experiences that Latina LGBTQQ women have with oppression, violence, and discrimination
- Address issues of accessibility (or inaccessibility) to health care
- Address issues related to physical and mental health among LGBTQQ Latinas
- Provide information to service providers and policymakers both in the Chicagoland area and nationally
- Generate a number of publications in an attempt to inform a wider audience of these issues
- Spark critical dialogues and raise consciousness of issues among community members
- Help Amigas Latinas to identify and meet the needs of its members and underserved populations (i.e., transgender and bisexual women)

A total of 305 people between the ages of 13 and 60 years old completed the survey (262 in English and 43 in Spanish). The results of the PL survey project revealed that Latina LGBTQQ

women in the Chicagoland area had significant experiences with discrimination, oppression, and violence/assault throughout their lives. The data speak to the prevalence of racism, sexism, and homophobia/heterosexism in women's lives, and suggests that LGBTQQ Latinas experience these harmful attitudes and behaviors from numerous communities and environments. In the survey, participants also identified the negative impact that prolonged exposure to oppression has had on their overall mental, emotional, and physical well-being; participants identified internalizing these harmful attitudes/actions and reported experiencing above-average levels of stress (48%), poor emotional health (21%), depression (21%), loneliness and isolation (49%), and suicidality (34%).

A persistent theme from PL survey respondents involved negative experiences with various institutions and physical and mental healthcare providers. LGBTQQ Latinas reported significant experiences of racism and homophobia/heterosexism in particular from hospitals, medical professionals, social service providers, and from governmental agencies. Such prevalent and recurring experiences with discrimination in this area serves as a barrier to LGBTQQ Latinas accessing physical and mental health care services, and consequently results in health disparities and decreased rates of participation in life-saving health screenings (such as mammograms, pap tests, colonoscopies, etc.). For example, 28 percent of respondents identified not disclosing their sexual orientation to their healthcare providers out of fear of rejection or negative treatment; among participants who have disclosed, nearly 15 percent reported that upon this disclosure, they experienced a negative reaction that added to the stress of their already existing illness or condition. These findings indicate that despite the implementation (on Federal and local levels) of antidiscrimination laws and policies, the presence of discrimination in health care and social service institutions continues to prevent access to adequate care for LGBTQQ Latinas.

In addition, the PL survey data also revealed that Latina LGBTQQ women also experience significant amounts of same-sex domestic violence. Forty-three percent of participants reported that a female partner had pushed or hit them, and 31 percent reported that a partner had threatened to kill them. Although the Illinois Domestic Violence Act theoretically serves everyone regardless of sexual orientation, Latina LGBTQQ women who are victims of violence and assault face many obstacles as they consider whether or not it is safe to attempt to get help. They may be reluctant to seek help because of the long history of racism and homophobia of the police and other legal institutions. Law enforcement agents often do not take complaints of violence from LGBTQQ women seriously. Many also face language barriers or may be reluctant to turn to the law because of their immigration status. Closeted LGBTQQ Latinas might also fear being outed by legal institutions or officers of the court. Additionally, queer women who are not out to their families or whose families are not accepting of their sexual identity may not feel that they can even turn to their families for help. These factors can create a devastating sense of fear and hopelessness for Latina LGBTQQ women who are survivors of violence. The need for funding to create LGBTQQ-friendly and competent social services and programs that adequately address violence and abuse experienced by Latina LGBTQQ women is evident and vitally needed. Nearly a quarter of PL survey respondents indicated the need for additional programming and services that LGBTQQ Latina survivors of violence and abuse can access for support.

In addition to PL, several recent studies have also pointed to the need to address issues of sexual and reproductive health of LGBTQQ women, particularly young queer women. Findings from studies conducted by AL, Affinity Community Services, the Young Women's Empowerment Project, and Howard Brown Health Center/Broadway Youth Center all indicate that a majority of LGBTQQ women are not having protected sex with female partners, and many are also engaging in sex (protected and unprotected) with men. Despite the common perception that young women who have sex with women are at reduced risk of sexually transmitted diseases (STDs) and pregnancy in comparison to other young women, recent preliminary evidence from these studies indicates that they actually may be just as, or even more likely, to practice sexual risk behavior, to engage in the sex trade, and to experience both STD and unwanted pregnancy outcomes. Very little research has been done to date that might help to explain this disproportionate risk.

The results of these studies point to the need for funding for additional research to assess LGBTQQ women's mental, physical, sexual, and reproductive health, and to explore potential points of intervention and support. The majority of funding sources available to researchers and social service agencies are to provide HIV intervention programs for men who have sex with men. Although these programs are vital, the health and well-being of LGBTQQ women, particularly women of color, are being ignored by scholars and providers, and the above-mentioned health disparities are consequently the result. Funding is needed for both individual behavioral as well as structural interventions and programs to adequately address the disparities and issues impacting LGBTQQ women. As the little data that are available has shown us, it is vitally important to create programs aimed at increasing the self-worth and reducing the prevalence of depression and suicidality among LGBTQQ women, because the increasing self-worth has shown a decrease in risk-taking behaviors and a positive impact on overall health. It is also equally important to create structural interventions to hold systems and institutions accountable for reducing barriers to care for LGBTQQ women and to create culturally competent services that are prepared to adequately address their needs.

EMILY GODFREY, M.D., M.P.H.

Association of Reproductive Health Professionals

Statement to Office of Research on Women's Health & National Institute of Health

Testimony Description

Good afternoon. My name is Dr. Emily Godfrey. I am a Board Member of the Association of Reproductive Health Professionals (ARHP) and serve as assistant professor of Family Medicine at the University of Illinois-Chicago. I also work here at Stroger Hospital of Cook County in the Division of Family Planning. I am presenting comments on behalf of ARHP.

ARHP was founded in 1963 and is a multidisciplinary professional association with over 12,000 reproductive health professional members who provide direct services, conduct reproductive research, and influence public policy. ARHP is offering comments today because we value evidence-based science and serve as a trusted resource for reproductive and sexual health

education and information. We meet our educational mission through a variety of educational programs, meetings, publications, and web-based activities. Through professional education, ARHP helps translate cutting-edge science for reproductive health care providers to improve patient care.

On behalf of ARHP and its members, I thank the Office of Research on Women's Health and the National Institute of Health for holding these meetings on new dimensions and strategies for women's health research and for the opportunity to offer comments this afternoon.

ARHP would like to take this opportunity to focus on several key issues that present opportunities for the ORWH and NIH—

1. Identifying research gaps that need immediate attention
2. Translating evidence-based science into continuing education for health care providers to improve clinical practices and patient care with Federal funding support
3. Promoting regular cross-agency and intra-departmental collaboration on reproductive and sexual health topics to develop innovative strategies

Of the many key aspects of reproductive and sexual health these two are of particular importance:

1. The effective translation of the latest clinical recommendations into the best clinical practice
2. The development of additional safe and effective forms of long-acting reversible contraception, or LARC

For efficiency and potential impact, more research is needed on effective translation of reproductive health-related science into practice. Unless research findings are converted into practice change, the intention of conducting research to inform clinical practice and patient care is lost. To truly improve patient care, it is important to identify professional education platforms that work. This can be accomplished through the development of comprehensive evidence-based guidelines, well-designed continuing education and training programs, and tools to evaluate their implementation.

For the development of innovative strategies and solutions, cross-agency and intra-departmental collaboration should be encouraged in order to develop better and more innovative strategies. Currently, different health topics are housed in different agencies or departments, and collaboration seems very challenging. This means, for example, that logically linked topics such as maternal and child health and reproductive health are studied independently by separate agencies or departments. By including a focus on maternal child health in a discussion of reproductive health, for example, important life-saving, health-promoting aspects of family planning emerge to improve maternal child health. By working within and across departments and agencies, redundancies can be reduced, efficiency improved, and costs cut.

As the Obama administration investigates ways to reduce abortion and unintended pregnancy rates, the CDC and NIH have collaborated on issues related to pre-term birth and unintended pregnancy. The discussion and research occurring between these two agencies has the potential to make a dramatic impact on both pre-term birth and unintended pregnancy rates. Further cooperation and communication between departments and agencies can only enhance and strengthen programs already proven to work.

The work currently being done around pre-term birth highlights the need not only for continuing education to implement practice change, but also the need for Federal funding to be available to ensure evidence-based scientific findings are incorporated into clinical practice. Unlike the many mechanisms now in place to support scientific research, there is no federally funded system designed to fund the translation of that research into practice. Now is the time to establish clear Federal funding mechanisms for the development of continuing education and health professions training curricula in reproductive health. This is a "fast track" solution to reducing health disparities and improving patient care.

For the sexual and reproductive health field, this would mean addressing the linked issues of contraception, sexuality, abortion, HIV and sexually transmitted infections, pregnancy, and maternal and child health, as well as increasing provider knowledge, skills, and understanding of these areas. Through adequate education and training of all clinicians, evidence-based, comprehensive sexual and reproductive health care can be brought directly to the patients, which is the primary goal of conducting meaningful research.

Recently, the National Institutes of Health and industry research have moved away from developing female contraceptive methods to a new focus on developing contraceptives for men. This research is important and should continue, but NIH should also maintain a focus on researching new safe, effective contraceptive methods for women, especially new LARC methods. ARHP advocates for the availability of as many safe and effective contraceptive methods as possible to meet the wide variety of needs of American women and men.

ARHP is encouraged by NIH's collaborative work with the CDC and hopes that cross-agency and intra-departmental collaboration continues to develop in order to improve efficiency, reduce redundancies and cut costs. An investment of Federal funding to develop and expand sexual and reproductive health continuing education for all providers throughout their careers would aid in the achievement of these goals.

Thank you again for the opportunity to present these comments. I welcome any questions you may have.

SIMONE KOEHLINGER

Chicago Department of Public Health

Improving the Knowledge Base of Lesbian, Bisexual, and Transgender Women's Health

1. The knowledge base of lesbian, bisexual, and transgender (LBT) women's health must be improved.
2. Research is needed to identify appropriate and accurate investigation tools, which include the following:
    - Survey and data collection items for sexual orientation and gender identity, including feasibility of including these items in research conducted with the general population
    - Mechanisms for LBT women to safely and accurately identify themselves
    - Recruitment and marketing methods to reach LBT women who are not tied to community organizations or events
3. Federal funding for longitudinal studies of LBT women is needed.
4. Research is needed that considers the following:
    - The holistic health of LBT women
    - The impact of stigma and discrimination on health
5. Regular national events to disseminate and process LBT women's health research need to be held.

PAMELA MCCANN, M.S.

Chicago Department of Public Health

A Research Imperative for Transgender Health—Population Definition

The "Research Invisibility" of the transgender populations is rooted in a lack of a rigorous definition of the populations for research purposes. The transgender community, when it is studied as a discrete population, is identified only by its presence at locations or by sexual behaviors linked to subject's stated gender dysphoria.

This lack of a definition too often means that studies cannot be duplicated, only simulated, that significant segments of those who identify as gender dysphoric are not included in studies because they do not exhibit a specific, usually sexual, behavior. A more subtle side effect of this lack of definition is the tendency to identify the population by its morbidities, and to group subpopulations together that may only share a risk behavior and call that assemblage the "transgender" population.

The transgender population is divided up several ways. The first is by "birth sex," ascertained most often by visual inspection of genitalia and gross anatomical form, creating categories of male-to-female (MTF) transgender persons and female-to-male (FTM) persons. A second

division of the transgender population is linked to sexual orientation (I will define sexual orientation from the perspective of the individual's stated gender identify, but this technique itself is not defined for research purposes!) into heterosexual, homosexual, and bisexual populations. These populations have many non-shared behaviors. For the transgender population, there is another dimension to the sexual scale that may constitute a third major division to the population, and that is the libido itself. This dimension was once considered so prominent among male-to-female transgender persons that it was used as a verification of a transgender diagnosis.

Most studies of the transgender population that I am familiar with identify subjects by birth sex. Fewer studies separate their subjects by true sexual orientation; most use the Centers for Disease Control and Prevention definition of men-who-have-sex-with-men, MSM for male-born individuals, however, I have not seen a distinction for female-born populations. The obvious problem with this approach for MTF transgender persons is combining them with the broader MSM population who do not share a gender identity issue.

The research imperative is to identify a set of qualifying transgender traits for MTF and FTM persons that is distinguished from the pathology being studied and allows for the random inclusion of individuals who are healthy (do not share the pathology of interest, most often human immunodeficiency virus/sexually transmitted infections, substance abuse, poverty, etc.). The transgender population is more diverse than a limited set of sexual behaviors or clothing choices, and researchers will benefit from better identifying members of this population.

CAROLYN STERN, M.D.

DeafDOC.org

Recommendations for Future Priorities in Women's Health Research Regarding Disparities & Diversity for Women who are Deaf/Hard of Hearing or Have Other Disabilities in the Coming Decade

For public testimony, I will focus primarily on women with disabilities; my emphasis will be on those who are deaf or hard of hearing (D/HH). There are significant overarching health disparities and diversity issues that need to be addressed to improve health outcomes for the upcoming decade.

First, I would like to give you a little personal background information; I will then address future concerns for research and women's health in the next 10 years.

I am a family physician, and as you can see, a woman. At birth, I had a severe-to-profound hearing loss due to maternal rubella; when I was 25, I became completely deaf due either to Meniere's or a vestibular neuritis.

As a deaf individual, I believe I have been very fortunate. Growing up, the word "can't" was not in my dictionary. I have always been encouraged by family and others to try new experiences and participate in activities, just like any other kid who CAN hear. I learned how to play violin,

dance, perform on stage, travel alone and with groups outside the United States, go to camp, and more. My family supported my auditory development. I was mainstreamed (placed in my home school district) and received years of auditory training and speech therapy. My education was not limited to school alone; I participated in many extracurricular activities and got jobs in research labs and other businesses.

One of my many challenges growing up was the lack of mentorship. My first mentor was a high school biology teacher who had epilepsy. It was not until my last year of high school that I met other deaf/hard-of-hearing individuals who were similar to me, yet I still had not heard of anyone in the medical field.

Thanks to several organizations—one was the American Association for the Advancement of Science (AAAS)—I realized there were other deaf/hard of hearing persons and scientists with disabilities in healthcare careers. I felt hope, even though their hearing loss or disability and career choices were different from mine. I knew I would need to "blaze a trail" so others could follow.

When my biology teacher explained about his epilepsy, I was the first to raise my hand and volunteer. I had the highest respect for him. Little did I realize just how much courage and strength it took to mention his hidden disability. It was not until college that my mentor's first words about his disability in class would have an impact. My professor asked me to talk about my hearing loss to my class in "Abnormal Psychology," and to explain what it was like to live with a hearing loss. As I went back to my seat, two people that had missed class the day before came up to me and asked if they could borrow my notes! I guessed that because I sat up front, I was considered a good student!

The point is clear and needs emphasis. Many do not understand the needs of a person with a disability.

Just as my family and extended network have supported me, I feel strongly about giving back. Medical school would prove to be the place to pave the way. Due to my advocacy efforts, as I graduated school only a few months before the Americans with Disabilities Act was signed, my efforts led to the formation of an Office for Students with Disabilities for the entire University—NOT just the medical school. I graduated from Northwestern University Medical School with family medicine as my chosen career.

Little did I realize my residency would prove to be another challenge! Two months into my training, I lost what hearing I had left. I would have good days (I heard as I did before) and bad days (I did not hear at all). In addition, I developed vertigo and tinnitus. After a year of fluctuating hearing loss, I received a cochlear implant, as my hearing aid no longer worked for me. Interestingly, it was not until I received my implant that I realized my "calling." I would become a primary care physician for the deaf/hard of hearing community. (I did not discriminate against those who could hear)! To this end, I immersed myself in the community and culture and gained fluency in American Sign Language. My loss became my gain—I now knew three languages: English, ASL, and Spanish! I gained awareness of a culture that I had not been aware of before, and through the years, value what deaf culture has to offer others. While

there is no hard-of-hearing "culture," hard of hearing people represent the majority of those with hearing loss.

I have now worked in the deaf/hard of hearing community for the last 18 years both nationally and internationally; I have cared for thousands of patients, worked with many interpreters, blazed trails in medical school and continuing medical education, and mentored many deaf/hard of hearing persons interested in and who have pursued health careers.

I would also like to bring my experience as a founding partner of my Web site, http://www.deafdoc.org and work with many other organizations that have formed my perspective. These organizations include the NIDCD as a co-chair of the task force on Communicating Informed Consent to Individuals Who Are Deaf or Hard of Hearing, in May 1999, and on a task force on Biomedical & Behavioral Research Career Opportunities for Deaf Individuals, in 2001. Many other organizations have been a strong part to my personal experience, and here is just a small sampling of who they are (If I have not mentioned an organization or individual, my apologies):

Nationally: Rochester and Illinois Schools for the Deaf; Advocate Medical Group; the Rehab Institute of Chicago; National Technical Institute for the Deaf/Rochester Institute of Technology—Post Secondary Network (PEN) International and the Community Interpreter Grant; the National Center for Deaf Health Research; the Accreditation Council for Continuing Medical Education; the American Academy of Family Physicians; the Joint Commission—Hospitals, Language, and Culture section; the National Center for Deaf Health Research at the University of Rochester; the University of California, Los Angeles and the Greater Los Angeles Association of the Deaf; Washington State Office of the Deaf and Hard of Hearing; Gallaudet University; the Association of Medical Professionals with Hearing Loss; and others.

Internationally: National University Corporation, Tsukuba University of Technology and other medical schools in Japan, USA Deaflympics, and PEN International-China.

Based on these experiences, here are the critical areas that need to be addressed in terms of health disparities and diversity within the disability community.

Before I delve into health disparities, we must understand what the issues are, so we can start when the child is first born with (or first acquires) a hearing loss or other disability. One of our biggest challenges in caring for a population with a disability is the lack of good statistical data. The data I will present are the most widely accepted and researched data. Most deaf/hard-of-hearing persons are born to parents who can hear (90 percent). It is also the most prevalent chronic disability (about 1-2/1000 births [1991 & 2000 data]). While universal hearing screening helps, the average age of diagnosis is still somewhere between 2–3 years of age. Part of the difficulty with hearing screening is loss to followup care. If a screen is abnormal, the family needs to return several times for reevaluation and assessment.

Yet another difficulty is language and language access for children with a hearing loss. A hearing aid or even a cochlear implant does NOT work the same as glasses do for most of us. It

takes years of therapy and for some, learning a new language, all while they are trying to raise a family. Ambient information, that most take for granted, is often not reiterated or relayed to the child with a hearing loss. As a result, many with hearing losses have significant delays in language and fund-of-information deficits.

To continue with some more statistics, about 1 in 10 persons, or about 30 million Americans has a hearing loss (2000 census), and the incidence of hearing loss increases with age. Most are hard of hearing and use various methods to communicate with others. Of the approximately 30 million, it has been estimated that somewhere between 400,000 and 1.5 million are deaf and prefer American Sign Language as their primary (not only) method of communication.

For those who are considered deaf, if the child has a hearing loss before the age of 3, they are considered "pre-lingually deaf." In the medical community, they have the health status similar to other language minorities. They often have poorer health status and see the doctor less often for preventive or ongoing care. Those who are "post-lingually deaf," or deaf after the age of 3, have the health status similar to those with a chronic illness. In general, they have poorer health, see the doctor less often, and receive less preventive services. In general, both groups have a lower socioeconomic status and are less likely to get higher education. They also have poor literacy skills, including health literacy. Job opportunities are often limited due to the language barrier and prejudice.

In general, women and others with disabilities have lower employment opportunities and status due to their disability and other issues.

Therefore, I propose these critical areas that need help from ORWH to improve health disparities for women with hearing losses and other disabilities.

1. Get good data about women with hearing losses and other disabilities. What is necessary for them to function fully in our society, and what we can do as a society to change to improve lives for those with hearing losses and other disabilities? Universal design is one such concept, but how can we make it cost effective and universally accepted as a mechanism to improve access for all?
2. Get data on health disparities in women with disabilities, especially those who are deaf/hard of hearing. We have little data on how many have diabetes, for example. We are getting some data on heart disease in deaf individuals, but so far, this is just the general deaf community. We need to find out from persons who are hard of hearing what their health care and access issues are.
3. Find ways to support women at all stages in life so they can pursue higher education, health and science careers. One critical concern is for those women who have either left the job market or for those women who wish to change careers or take on another opportunity. Find ways for funding for those who want to enter research without taking a significant pay cut as they try to support their families at the same time.

4. Language barriers need to be broken down and understood. Language access should be a separate budget item, for conferences, research grants, and other programs offered. One or two people need to be responsible for language access, training of interpreters (if required), or materials needed for quality access to critical programs if research careers are an interest of the ORWH. As an example, I attended a health conference recently with three other deaf health professionals. Each of us requested an interpreter separately to be able to participate in the conference. This conference offered the opportunity to learn about grants and the process. When we arrived at the conference, there were only two interpreters...and not until the afternoon! In short, our time and money to come to the conference was wasted, since none of us were able to attend any of the break-out sessions we wished to attend. No one from the organizing committee contacted us to find out what we needed or how they could make it work for the best possible conference.

5. Increase research fellowship opportunities with matching funds; for example, increase salaries for those already in health careers who wish to return and pursue academia or research. Currently, pay scales stop at 5 to 7 years into the original career. However, for researchers, the top salary is one third of what physicians make. More women are supporting families or are head of households; to take a severe cut in pay is a challenge for women to pursue research careers.

6. Training programs need to be developed for interpreters and "real time captioners" or CART translators, so they can better negotiate the academic/research/scientific landscape and jargon necessary for deaf individuals to be successful in these careers.

7. Work with communities and schools to improve health education and literacy. Work with guidance and other school personnel to teach them about research, researchers, and career opportunities.

8. Work with academic institutions and hiring organizations (i.e., businesses/academic centers) to improve awareness of interpreter and other support services, either with incentives, or education regarding funding for services (tax credits/breaks).

9. Work with academic institutions and hiring organizations (i.e., businesses/academic centers) to improve access for those with hearing losses or other disabilities, to teach AND hire those with disabilities, particularly those who are deaf/hard of hearing. Develop a list of companies that have hired persons with disabilities and which companies/organizations people have worked with to ensure that persons with disabilities can get jobs.

10. Make sure there are career opportunities in health care and health research for women with hearing loss and other disabilities.

11. Research best practices for patient care for persons with disabilities, as well as health care providers with disabilities. How can we make universal design a reality?

12. Make the ORWH Web site fully accessible! If a video is shown, provide captions, and where possible, ASL interpretation.

13. Provide more opportunities to include people with disabilities in research studies by including funding sources for language services, transportation, and a guide to help emphasize the importance of including those with disabilities or hearing losses. Make sure researchers are aware of communication methods and needs for those who are deaf/hard of hearing.

14. Frequently, ethnic and racial minorities have taken precedence. In Healthy People 2010 and 2020, people with disabilities need improvement in health care and health care access. There are many racial and ethnic minorities in the deaf/hard of hearing community, as well.

15. Include interpreters, the deaf/hard of hearing, and others with disabilities as part of community based participatory research, to improve recruitment, retention in research and health care in general.

16. Improve health education for those who are deaf/hard of hearing, have limited English proficiency, and for those with disabilities by offering multiple formats for receiving and learning information.

17. Improve mentorship, networking opportunities and ways to publicly role model successful women with hearing losses and other disabilities in their careers.

18. While I realize that many in NIH prefer seasoned grant writers, offer opportunities for women with disabilities and hearing losses to work with someone either within NIH or within a nearby University to be able to perform research both within and without the research sector. Another possibility is to offer online or teleconferencing or e-learning opportunities and peer mentorship to pursue grants and research. Make sure these opportunities are accessible to all.

19. The grant opportunities are often written in complex language with jargon, and it is not easy to find out the information; often those with hearing loss are left behind. Offer ways for the deaf/hard-of-hearing researcher or one interested in research the opportunity, just like everyone else, to find out information.

We have come a long way since the Americans with Disabilities Act of 1990 and before that Sections 504 and 503 of Civil Rights legislation. We still have more to do! The expression goes, “If we feed a man fish, we have taken care of him for one day, but if we teach a man to fish, he can be successful for a whole lifetime.” The same holds true for working with those who are deaf/hard-of-hearing or have other disabilities. If we educate now, work together with communities, academia, and businesses to provide career, research, and other opportunities, we prevent many problems and have engendered success for a lifetime. A mind is truly a terrible thing to waste.

SUSAN LOVE, M.D., M.B.A., FACS

Dr. Susan Love Research Foundation/Army of Women

New Breast Cancer Initiative Creates Partnership Between Scientists and Women: The Love/Avon Army of Women: A Paradigm-Changing Research Resource

We are honored to have been asked to submit testimony regarding new strategies and direction for the Office of Research on Women's Health. We would like to describe our exciting national initiative and its successes to date and future goals. Being an innovative research project, the Love/Avon Army of Women would seem to fit perfectly into the scope of the ORWH's research agenda for the coming decade. We would like to share how this novel program can easily enhance research projects' recruitment efforts and accelerate discovery into the cause and prevention of breast cancer and other women's health issues. The Dr. Susan Love Research Foundation and the Avon Foundation for Women, a global leader in breast cancer research, have joined forces to launch a revolutionary new program: the Love/Avon Army of Women (AOW). This groundbreaking initiative is designed to accelerate breast cancer research by providing a 21st century model of a "just in time" online resource of volunteers that will allow scientists to recruit women for research studies aimed at finding the cause of breast cancer and how to prevent it. It also allows collaboration among scientists accessing the data, asking new questions, then sharing it back with the research participants.

"Women have repeatedly demonstrated through their fundraising and advocacy their dedication to ending this disease," says Dr. Susan Love, one of the founding mothers of the breast cancer advocacy movement. "This new initiative gives women the opportunity to take the next steps and be part of the research itself." Dr. Love, a renowned breast cancer surgeon and respected expert in the field, is also the author of the best-selling *Dr. Susan Love's Breast Book* and is president of the Dr. Susan Love Research Foundation.

"Avon is itself an 'army of women,' and we are committed to being the company and the foundation for women," explained Andrea Jung, Chairman and Chief Executive Officer of Avon Products, Inc. "The Army of Women is a perfect marriage of our global leadership in the breast cancer cause and our grassroots access to women across the country."

The Army of Women intends to recruit 1 million women—healthy women who have never had cancer, high-risk women, and breast cancer survivors—who are interested in partnering with scientists by taking part in research studies. The AOW is neither a clinical trials matching service, nor is it a tissue bank. And it does not provide funding. It was developed with the sole intent of promoting research studies utilizing women to research the etiology, causes, and prevention of breast cancer by providing scientists a vehicle to access volunteers they need.

Women who are interested register on the Army of Women Web site, http://www.armyofwomen.org, providing year of birth, Zip code, and ethnicity. Launched in October of 2008 on national media, the Army of Women now has more than 310,000 members—the majority of whom do not have personal experience with the disease but have the desire to participate in research to discover its causes. Women from around the world and from every State in the

United States have joined. Eighty-five percent are Caucasian, and ages range from 18 to 99 years with a mean age of 56. We have started efforts to increase our minority membership.

Research scientists register with the Army of Women online at http://www.armyofwomen.org for the opportunity to submit project proposals to recruit volunteers for their studies. Studies are reviewed by a Scientific Advisory Committee and are held to the highest ethical standards before being released to the Army of Women. All studies have institutional review board (IRB) approval before being sent out to AOW members.

After a research proposal has been accepted, the Army of Women sends out an e-mail notice to all Army volunteers that describes the study, eligibility, and what participation will involve. Women self-select the studies that interest them and for which they are eligible. They can also forward on the e-mail to someone else they think might be eligible. Army of Women staff coordinate the tissue collection process with either the scientist or an Army of Women collection center where volunteers can go to give a blood, urine, breast fluid, or breast tissue sample. Researchers can also use the Army of Women for epidemiology studies or recruitment for prevention research. To date, 14 studies, approximately 2 a month, have been sent out via e-mail; 6 are now closed and 8 are still open. The first study sent out in October 2008 to recruit women for the Sister Study, a large national effort, was able to recruit nearly 4,000 qualified women in 2 weeks and to successfully close the study, which began in 2003. "The Army of Women is an important step in empowering women to participate in research and ensure that study results apply to all women. The Sister Study is thrilled to be included in the Love/Avon Army of Women!" says Dale Sandler, Ph.D., of the National Institute of Environmental Health Sciences of the National Institutes of Health. Studies sent out have accrued more women than the researchers had anticipated and in a much shorter time. To date, nearly 12,000 women are or have now participated in the clinical research process.

AOW members can also apply to participate in our "foot soldier" program and act as spokespeople at local events to raise awareness about the Army of Women and research efforts.

In October 2009, to celebrate the first anniversary of the Army of Women, efforts are underway to launch a large longitudinal cohort study of AOW members, to be called the Health of Women or HOW Study. The study is being conducted in collaboration with the National Cancer Institute's CaBIG (Cancer Biomedical Informatics Grid) and the City of Hope's epidemiology team of Drs. Leslie Bernstein and Katherine Henderson. Online surveys will be sent to AOW members every 3 to 4 months for the next several years. We see this as the largest cohort study to date that will be totally done online, and the results can be shared with other qualified researchers. Our goal is to have 1 million women, and because we are doing it online, we should be able to be fairly nimble about what we can do and what questions we can ask. We hope to demonstrate a new 21st Century model of research, one that is empowering of consumers and one that is technology-enabled. Utilizing Web technology, we can facilitate women signing up and responding to secure online questionnaires and then facilitate authorized researchers to access this information. The Web-based software will allow the infrastructure to be immensely dynamic, cost efficient, and time sensitive. We see this specific platform as eventually having the capacity to look at other forms of cancer or other diseases.

Breast cancer research at this time is concentrated primarily on improving imaging devices that can detect tumors early, developing drugs to kill cancer cells, and understanding why cancer cells become resistant to existing drugs. The Army of Women will encourage researchers to shift their focus from developing new treatments to understanding what causes normal human cells to become cancer cells in the first place. In addition, by providing scientists with the healthy women they need but often have difficulty finding, the Army of Women will make it possible for them to shift their focus from the lab, where much of the molecular work is currently being conducted on mice or in cell culture, to real women.

Scientists throughout the United States have already expressed their interest in partnering with the Army of Women. "The Army of Women is going to revolutionize the way biologists do research," says Thea Tlsty, Ph.D., a pathologist and cancer researcher at the University of California–San Francisco. "I'm eager to submit a proposal and to begin doing work with Army of Women volunteers."

Here in Chicago this July, the AOW recruited the 300 women for Northwestern University's BEAM (Breast Estrogen and Methylation) Study in 1 month.

We are currently looking for more scientists who have projects needing human breast tissue, ductal fluid, urine, saliva, or blood as well as data for epidemiology. Army of Women Collection Centers for tissue specimens have been set up in various geographic areas if researchers are not able to collect specimens themselves or desire faster accrual.

The National Breast Cancer Coalition, a grassroots advocacy organization, and the American Association of Cancer Research, a scientific organization focused on high-quality, innovative cancer research, have agreed to partner with the Army of Women in directing and supporting this initiative. The organizations will represent the concerns of scientists and advocates as well as help in their recruitment.

We again thank you for this opportunity to better explain our program. We are confident that its success can translate to other disciplines in the future and can become the mainstay of recruitment and collaboration for clinical research.

To find out more about the Love/Avon Army of Women, please visit
http://www.armyofwomen.org

NAOMI LYNN GERBER, M.D.

George Mason University

Statement to Office of Research on Women's Health & National Institute of Health

Testimony Description

Thank you for the opportunity to present some ideas for the strategic planning initiative of the Office for Research in Women's Health. My name is Naomi Lynn Gerber, I am a rheumatologist and physiatrist who has spent my entire career in a biomedical research facility trying to study contributors to disability, how to prevent it, ameliorate it and restore function. My research, and that of the center at George Mason, is aimed at understanding the linkages between chronic illness and disability.

I wish to address my comments to two aspects of the goals of this conference:

1. How can we best prepare women for the future, with regard to health and wellbeing?
2. How can we proceed in the most efficient, cost-effective and valid ways to do that?

What will the future bring? I certainly do not know the answer. However, we know that there is a major drive towards personalized care and more sophisticated, complex and possibly confusing practices. Women have substantial needs if they are to successfully navigate these likely trends.

Generally, they are consumers for themselves and their families on both ends of the spectrum. They need to be well educated, and this needs to start early in life.

This includes achieving scientific literacy, in order to wade through tantalizing opportunities for genetic screening and decision making about life-prolonging or life-ending interventions etc. This also includes managerial skills to help coordinate increasingly complex care plans for themselves and family. The impact of personalized medicine opens up great opportunities, but also challenges that will require a concerted effort to educate and assist with needed behavioral change to martial our best efforts at prevention, early intervention and sensible treatment choice.

Specific areas for surveillance, education and early detection in the promotion of women's health include:

1. Addressing issues of addiction. Alcoholism, for example is on the rise in women, and motor vehicle fatalities are up 30 percent in the last decade attributable to female drunk drivers. What is the sociobiology of this? To what key factors can we attribute this trend?
2. Addressing tumors whose course/frequency or severity are putting women at significant risk. Lung cancer, head/neck tumors: Women are facing both small and non-small cell lung tumors. Head/neck tumors are increasing in women, possibly due to human papilloma virus virulent strains. Do adult women need to be immunized against HPV? What is the sociobiology of these?

3. Addressing issues of decrepitude and frailty, social and medical problems particularly important to women, whose life expectancy is longer than med. As a rehabilitation physician, the loss of bone and muscle mass is a critical problem. Muscle is replaced by fat as we age, and we have very little we can do to stem this tide. Why? Are questions of energy production, energy consumption and fat storage central to maintaining or increasing lean mass and in what way? Building mass in the young, maintaining it in the adult years and blocking its replacement with fat in the later years should be a research priority for women's health.

4. The application of technology presents new and exciting opportunities for the disabled. Women, in particular, are likely to require assistance in daily living as they age alone. In addition, haptic and robotic devices may assist in helping teach motor and cognitive tasks. These devices can help with the delivery of care remotely, using tele-medicine and tele-rehabilitation approaches. There is need for these devices and for the exploration of how they can be used to monitor the status of individuals living independently as well as deliver assistance. Support for miniaturization of equipment, development of longer more powerful batteries and environmental adaptation to improve safety for the elderly living alone should be a priority.

5. The last decade has seen significant improvement in health outcomes, in part because of successful campaigns to change behavior. Examples include use of seatbelts, reduction in smoking, obtaining screening mammograms and colonoscopy. We need to study the mechanisms by which these programs have succeeded in changing behavior. Models for this could be tried in some of our most challenging areas that are in need of such behavioral change. For women, this includes weight control, addiction management, and adherence to exercise/activity programs throughout the life span. Behavioral change is one of the most difficult things to accomplish; studies into how this is accomplished and reinforced over time is critical to health of women.

How will we know we are effective?

New approaches to assuring quality health care delivery are on the agendas of consumers, health care providers, legislators and Federal regulators. There has been a considerable amount of discussion about the importance of measuring the performance of health care providers. The Centers for Medicare and Medicaid Services have been developing a system of pay for performance in an effort to improve quality care and control costs. In addition, the NIH has committed a considerable amount of resource to developing reliable patient reported outcomes in an effort to standardize these measures and reduce redundancy in self-reports performed in many clinical trials. Scientists have acknowledged the importance of self-reports, which are often the only way to assess symptoms. Issues remain to be addressed in selecting proper outcome measures for clinical trials as well as for routine treatment. Most physicians, patients and biomedical researchers are not willing to accept a lab value as the only outcome for a treatment intervention. Yet, many are uncertain about the validity and usefulness of measures that are not objective. While improvement in laboratory profiles are often necessary conditions for health, and we aim to achieve normal values, the measure of independence, mood, affect, life

satisfaction, control of pain and fatigue are often among the most important outcomes sought by patients, their families and health professionals. Instruments to measure these latter, efficiently, with the least redundancy and the least burden in terms of time and intrusiveness, are still fairly insensitive and difficult to verify with objective measures. We should aim to develop measures and approaches to measurements that will provide this kind of information. The application of computer technologies, medical informatics and item response theory, holds promise for achieving these goals. The use of valid, sensitive, easily administered outcome measures are needed to demonstrate comparative efficacy of treatments, and to help patients make informed choices. Women, who often have to make decisions for children and parents, stand to benefit significantly from improving this methodology. New instruments must be developed to extend our assessments beyond physical findings and biological measures, into the areas of function, physical activity, societal integration and participation. Our definition of health has broadened to include the interactions of whole persons with their environment, and has acknowledged the value of measure life satisfaction and quality. We must add these measures to those we aim to capture describing genetic, epigenetic, molecular and physiological processes that support human behavior and activity.

AMBER HOLLIBAUGH

Howard Brown Health Center

A Public Testimony of Howard Brown Health Center Before the Office of Research on Women's Health, October 2009

My name is Amber Hollibaugh, and I am the Chief Officer of Elder and Lesbian, Bisexual, Transgender, and Intersexual (LBTI) Women's Services at Howard Brown Health Center. I am presenting this testimony on behalf of Howard Brown Health Center, the largest lesbian, gay, bisexual, and transgender (LGBT) organization in the Midwest, serving more than 36,000 people each year. Our diverse health and social service delivery system is focused around eight major programmatic divisions, including primary medical care, behavioral health, research, human immunodeficiency virus/sexually transmitted diseases prevention, youth services, elder services, LBTI women's services, and community initiatives. Howard Brown designed these programs to serve the LGBT community in a confidential, supportive, and nurturing environment.

Howard Brown's Research Department is not only our largest division, but also has a long tradition of participating in federally funded research initiatives. In the 1970s, Howard Brown gained national prominence through its involvement in the Hepatitis B vaccine trials, which led to the development and testing of an effective vaccine. For our work as one of the lead agencies in the Multicenter AIDS Cohort Study, a longitudinal study of the natural history of AIDS in gay and bisexual men, we continue to receive national recognition. Currently, Howard Brown collaborates with local universities, area hospitals, and other community-based organizations and receives approximately $5.5 million from the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC), either directly or through subcontracts, to conduct groundbreaking research on LGBT populations.

Our research program focuses primarily on men, not because we do not recognize critical areas of health disparity among sexual minority women, but because funding is scarce. Of the $5.5 million that our research department receives from the NIH and CDC, only a little more than $100,000 is devoted to exploring the health issues and needs of sexual minority women.

In 1997, the Office of Research on Women's Health (ORWH), the CDC, and the NIH convened the Institute of Medicine Committee on Lesbian Health Research Priorities. I am proud to say that I participated in and testified at that historic meeting to argue at that time for the importance of research focused on sexual minority women. From that hearing, the Committee recommended that the Federal Government provide funding to further the knowledge about risk and protective factors among these women, to improve research methods for studying lesbian health, to increase understanding of the diversity among lesbian women, and to improve lesbians' access to health care.

Now, more than 10 years later, I am here again. And while we have a greater appreciation for the diversity of needs among sexual minority women, including not only lesbians, but also bisexual and transgender individuals' health needs, we still do not have adequate funding to advance scientific knowledge on sexual minority women's health. We still lack data about women in our community, which hampers our ability to create evidence-based health programs and interventions to address areas of need, including disparate rates of breast and cervical cancer, overweight and obesity, smoking, alcohol use, suicide, STDs, and HIV infection among high-risk women, disparities which stem, in part, from the social marginalization associated with sexual and gender minority status.

As an organization trusted and respected by the LGBT community, we see women everyday in our health and social service programs who are negatively impacted by these conditions, individuals who often remain hidden to other service providers. To fulfill our commitment to their health and wellbeing, and in recognition of their specific health needs, we renew the call for Federal funding to develop more sophisticated studies of sexual minority women, to advanced related research methodologies, and to routinely include sexual orientation and gender identity in studies of the health status of women. We strongly encourage the development of specific Federal funding mechanisms to support these efforts.

I want to end by commending the NIH/ORWH for its ongoing recognition concerning the importance of research activities for this "understudied population" and in considering this population a significant area of focus as you work to develop the agenda for the next decade of research priorities by the NIH/ORWH.

JENNIFER MCGUIRE, M.S., RD

National Fisheries Institute

Research Needed To Understand the Consequences of a Low-Seafood Diet Among Pregnant Women

Increasingly, scientists are pointing to a widespread deficiency of seafood and omega-3 fatty acids in Americans' diets as a leading culprit in deadly heart disease and diseases related to brain and eye function, to name a few.[1] How this deficiency is impacting the population of pregnant women and their developing babies is less understood. I am writing to urge the Office of Research on Women's Health (ORWH) to consider new research to better understand the emerging role of seafood, the only natural source of essential omega-3s in the diet, in the best possible pregnancy outcomes for both mother and child.

We know that during the last trimester of pregnancy, a fetus's brain and nervous system rapidly develops, requiring about 65 mg/day of a type of omega-3 fat called docosahexaenoic acid (DHA).[2] DHA is essential, meaning the body does not make it and it must come from the diet. Therefore, a developing baby is completely dependant on what its mother eats for the omega-3 DHA its growing brain and nervous system need.[3]

These needs can be met by eating seafood, particularly oily fish like tuna or salmon, about two to three times a week, totaling approximately 12 ounces. But typically pregnant American women eat less than 1/6th this amount, according to the following data from the U.S. Food and Drug Administration Center for Food Safety and Applied Nutrition (FDA CFSAN):[4]

- Pregnant women: 1.89 ounces seafood per week
- Postpartum women: 2.17 ounces seafood per week
- Nonpregnant women: 2.97 ounces seafood per week

It is essential that we understand the full ramifications of this low-seafood diet because emerging science reveals measurable risks. For example, a number of recent studies suggest optimal brain and eye development in babies is at stake. And if babies aren't getting enough of the nutrients from fish, namely omega-3s, it appears their mothers certainly aren't, either. There is a growing body of evidence through the work of Dr. Carol Lammi-Keefe at Louisiana State University with women between 6 and 9 months pregnant that the state of pregnancy depletes omega-3 DHA in the mother to supply the fetus. Omega-3s are not replenished unless the mother eats enough foods with these essential fatty acids during and after pregnancy. Dr. Lammi-Keefe has found that macular pigment density, a marker for the development of age-related macular degeneration later in life, is related to how much fish expecting mothers eat during pregnancy.[5]

The data also suggest the omega-3 deficiency brought on by a low-seafood diet may have some serious short-term consequences for pregnant mothers. Specifically, in a landmark study, researchers with the University of Bristol studied more than 14,000 women about 7 months into their pregnancies to determine if low seafood intake increases risk of depression. Results showed pregnant mothers who ate no seafood were nearly 50 percent more likely to have

symptoms of depression than pregnant mothers who ate the most seafood (at least three servings of fish a week). Researchers concluded in July's edition of *Epidemiology,* that the FDA/Environmental Protection Agency (EPA) advice to eat no more than 2–3 servings of fish per week during pregnancy could increase the risk of depression among pregnant mothers.[6]

A review from September's edition of the *Journal of the American Dietetic Association* explored the rising prevalence of mental illness in the world, with a focus on perinatal depression. Conservative estimates of up to 20 percent and 16 percent of women experience depression during and after pregnancy, respectively. The article concludes "nutrient inadequacies in pregnant women who consume a typical western diet might be much more common than researchers and clinicians realize" and "depletion of nutrient reserves throughout pregnancy can increase a woman's risk for maternal depression." The authors find that science is just beginning to uncover the role of how food choices affect our mental health and mood, and while some relationships between diet and depression have been uncovered in the general population, disproportionately, little is known about nutrient deficiencies and maternal depression.[7]

Ironically, most studies about diet and depression have specifically excluded pregnant women. But the understudied population of expecting moms is at increased risk for having dangerously low levels of nutrients like omega-3s and vitamin D due to their babies' needs. According to the authors, "there is a compelling argument for longitudinal research that targets this important topic as its primary focus."[7]

New research is needed to measure the magnitude of diets void in seafood and omega-3s during pregnancy and expand our understanding of the resulting consequences to the nervous system such as perinatal depression. This research is required for effective science-based nutrition recommendations that result in optimal pregnancy outcomes.

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PAULINE MAKI, PH.D.

North American Menopause Society (NAMS)

Working With Researchers and Nonprofit Organizations To Identify and Treat Cognitive and Mood Symptoms During the Menopausal Transition

My name is Dr. Pauline Maki. I am an Associate Professor of Psychiatry and Psychology at the University of Illinois at Chicago. I am a member of the Board of Trustees of the North American Menopause Society (NAMS) and a Chair-Elect of the NAMS Research Affairs Committee. I present my public testimony today as a member of NAMS and as a clinical researcher with a longstanding interest in menopause, cognition, and mood.

The North American Menopause Society is a 20-year-old nonprofit organization dedicated to promoting the health and quality of life of women through an understanding of menopause. Its membership of about 2,000 interacts with women via many disciplines, including medicine, nursing, and research. The professional diversity of the NAMS membership provides a unique opportunity to highlight gaps in knowledge, identify research opportunities, translate and disseminate the best quality research on menopause, and ultimately improve the care of peri- and postmenopausal women.

The diverse membership of NAMS has consistently identified the subject of mood and cognition as an important research topic and a subject for continuing education for menopause practitioners. Evidence that NAMS values the dissemination of research on cognition and mood comes from a review of publications in the official NAMS journal, *Menopause*. From the year 2000 to 2007, 18 percent of articles published in NAMS were on the topic of cognition and mood.

The 2005 NIH State-of-the-Science Conference Statement on Management of Menopause-Related Symptoms concluded that the evidence that the menopausal transition leads to mood changes was mixed, and evidence that the menopausal transition leads to cognitive changes was considered insufficient. Although evidence of cognitive changes remains inconclusive, research over the past 7 years has contributed to a profound shift in our understanding of the effects of menopause on depression.

Now, at least four prospective studies have documented that there is an increased risk of clinically significant depressive symptoms in women as they transition from the premenopausal stage to the perimenopausal stage. The magnitude of this risk is substantial. Compared to

when she was premenopausal, a woman is two to four times as likely to have symptoms of depression during the perimenopausal stage. Importantly, this risk is observed in women who have no history of clinical depression. It is important to stress that the majority of women do not experience clinically significant depressive symptoms. However, as with premenstrual dysphoric disorder, commonly known as PMS, there appears to be a significant subgroup of women for whom the menopausal transition represents a period of increased vulnerability to clinically significant depressive symptoms.

Clinical depression predisposes a woman not only to psychiatric complications, but also to the development of cardiovascular disease and dementia. In 2002, the U.S. Preventive Services Task Force concluded that one-time screening for depressive disorders in adults, when combined with effective followup, reduces the risk for persistent depression. In addition, the task force concluded that such screening programs are as cost-effective as mammography screening of women over age 50 or treatment of mild-to-moderate hypertension. Therefore, it is critically important that menopausal practitioners are able to identify and treat depression in their patients.

To that end, I would like to express my gratitude to the Office of Research on Women's Health (ORWH), the National Institute on Aging, and the National Institutes of Health for supporting the sold-out NAMS Symposium entitled, "Depressive Symptoms and Cognitive Complaints in the Menopause Transition." That Symposium translated the recent scientific literature on depression to an audience composed primarily of menopause practitioners. The ORWH and the NIH also support the Study of Women's Health Across the Nation, which has yielded more than 200 publications on the natural and treated history of the menopause, and several impactful publications on menopause and depressive symptoms. The NIH also supports the ongoing MS-FLASH project, which seeks alternative treatments for menopausal symptoms.

Despite these notable successes, much more research needs to be done to further our understanding of the psychological symptoms of the menopausal transition. For today, I will conclude my testimony by noting just three of the many topics in need of further research. The first topic is depressive disorders. We are beginning to appreciate that a subset of women are at risk for depression as they transition through the menopause, but we do not yet know how to best identify them in order to prevent or treat their perimenopausal depression. The second topic is anxiety disorders. Our understanding of anxiety disorders in the menopausal transition is especially poor, though a recent study from the Mayo Clinic demonstrated a 50 percent increased risk for anxiety disorders in women who had their ovaries removed before the menopause. The third topic is cognitive function. Clinical trials have demonstrated that certain forms of combination (estrogen plus progesterone) hormone therapy effectively treat hot flashes but lower memory performance, even when administered to younger postmenopausal women with moderate to severe hot flashes. To date, there have been no head-to-head clinical trials to guide treatment decisions about which forms of combination hormone therapy have neutral, or possibly beneficial, effects on cognitive function. Such trials are needed because the majority of women who receive hormone therapy receive combination hormone therapy.

In summary, I would like to thank the ORWH, the NIA, and the NIH for their strong support of research on psychological risk factors of menopause. I would also like to encourage them to continue to work with the North American Menopause Society and other nonprofit organizations to improve the lives of women by translating new research findings to clinical practice.

RILEY D. JOHNSON, M.A.

Queer People's Health Collective

Unknown and Unresearched: The Transgender and Transsexual Community of the United States

This testimony is presented on behalf of my initiatives, Queer People's Health Collective (QPHC) and the Trans Gynecology Access Program (TGAP). QPHC seeks to educate Lesbian/Gay/Bisexual/Transgender/Queer people about their bodies and their health options and to work with providers to better serve their LGBTQ clients. TGAP is a joint endeavor between QPHC and the Chicago Women's Health Center to provide transmasculine clients with the option of being accompanied by a transman health educator during any part of their exam experience. In addition, this testimony is informed by my continued research on transmen's health experiences as a part of my graduate degree program at DePaul University.

Health obstacles continue to be faced by LGBTQ people, and effects remain unstudied. Given that identity does not necessarily equal behavior (and vice versa), pinpointing the population size of LGBTQ people in the United States is next to impossible, but recent estimates place lesbian/gay/bisexual people at 3 of 100 individuals, conservatively, and trans people at 1 of 500 births overall.

Transgender and transsexual people face a unique research dilemma in that the complexities of our legal, social, and biological realities are neither observed nor properly understood. A study by Ulrike Boehmer[1] examined the MEDLINE database and found that, despite nearly 4 million articles over the 20 year period from 1980 to1999, only 346 articles in any way mentioned transgender or transsexual people. As a result of the overall lack of research, we lack the data to create and sustain larger public health efforts and must instead enact culturally appropriate healthcare on more of an ad hoc basis. Additionally, if they exist, ad hoc programs like TGAP are mostly found in metropolitan areas, and those living outside the urban area must either travel considerable distances for services or go without them. When coupled with demonstrated trends of greater substance abuse, violence, and suicide in addition to fewer preventative screenings, these barriers to culturally appropriate care are a clear indicator that inclusive research is crucial to the planning of public health efforts, and in turn, the longevity of our communities. To be specific, QPHC would like to see the following research topics investigated: the mental and physical health impacts of violence and threats of violence, issues related to insurance coverage for trans clients (including lack of insurance coverage, insurance denials for trans health services, insurance denials for traditional health services [e.g., a broken arm] when the client happens to be transgender/transsexual), and the research impact of the continued use of the misapplied men-who-have-sex-with-men category for male-to-female spectrum clients.

QPHC strongly urges research inquiry into conditions that affect transgender and transsexual people at greater rates, particularly the impact of long-term cross-gender hormone usage, the higher occurrence of polycystic ovarian disease (PCOS) within female to male spectrum populations, and the practice of engaging in high-risk sexual behavior as a means of social belonging acknowledged thus far anecdotally in gay/bi/queer identified female to male spectrum populations. These topics and others have not been adequately studied, leaving health workers and clients alike wondering how best to proceed.

Like the lesbian/gay/bisexual community, transgender and transsexual people have often served as both clients of and educators to providers. This practice, while sometimes necessary, can create problems—for example, when a transgender or transsexual client is misinformed or lacks a comprehensive understanding of the body's physiology. QPHC was created to increase individual client knowledge as well as provide clients with pamphlets they can give to their provider to increase provider knowledge of LGBTQ realities. QPHC strongly recommends the full and routine inclusion of LGBTQ topics within preparatory programs for health and wellness workers. Sample curricula exist for LGBTQ health and mental health and can be easily implemented within existing medical, dental, pharmacy, psychological, nursing, and social work training programs. Panels of LGBTQ people willing to speak about their experiences should also supplement traditional academic curricula, blending both theory and praxis.

Further, QPHC recommends the inclusion of questions concerning sexual orientation and gender identity within research protocols. The American Medical Association, American Public Health Association, and National Coalition for LGBT Health each recommend such inclusion, though there seem to be no methods of accountability and no knowledge whether it actually occurs within mainstream research. Additionally, we strongly urge researchers to create instruments and methods that can capture the complexity of transgender and transsexual legal, social, and physical realities. An example of the complexity is a female to male spectrum client who has identity documents that may or may not match his current physical presentation, despite living and working as a man, interacts with a gynecology researcher or health worker. While it would be easy for the outside viewer to say this example is purely an anomaly, within trans communities, this level of complexity is known to be quite common.

In conclusion, my TGAP colleague, Terri Kapsalis, Ph.D., author of the book, *Public Privates,* has observed the obvious similarities between today's trans community and the women's community of the 1970s. We face some of the same challenges (lack of research, lack of access to information, and lack of inclusion in preparatory programs), and we have come up with some of the same solutions (e.g., the creation of ad hoc programs). Time will only tell if we are able to make the same sort of progress toward securing more sensitive, culturally appropriate, and affordable care for our communities.

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COLLEEN M. FITZGERALD, M.D.

Rehabilitation Institute of Chicago

Women's Health Rehabilitation

Testimony Description

My name is Dr. Colleen Fitzgerald. I am currently an assistant professor in the Department of Physical Medicine and Rehabilitation at Northwestern University Feinberg School of Medicine, Medical Director of the Rehabilitation Institute of Chicago (RIC) Women's Health Rehabilitation Program, and a current Building Interdisciplinary Research Careers in Women's Health (BIRCWH) Scholar. I came to Northwestern in 1992 as a young medical student eager to care for patients and fulfill my lifelong dream of becoming a physician. Having grown up in Chicago, the oldest in a family of four sisters, I was always raised to believe that as a woman, there was nothing I couldn't do. Between my first and second year of medical school in 1993, I did an externship at RIC–a choice that proved to be a pivotal point in my career. While there, I worked under Dr. Joanne Smith, a physician specializing in physical medicine and rehabilitation with a clinical interest in women's health rehabilitation, who is now RIC's President and Chief Executive Officer. Before knowing what specialty I would even choose, having witnessed the extraordinary care Dr. Smith provided, I asked Dr. Smith to be my medical school mentor. I did other rotations, but rehabilitation stuck with me. I felt like the physicians at RIC had a great opportunity to address difficult problems in unique ways that positively impacted a patient's quality of life.

I was fortunate enough to train in residency at RIC where I was exposed to an even greater breadth of women's health issues. From sexuality in disability to hidden issues of pelvic pain and incontinence, I was moved by the lack of care available to women. In 2005 RIC supported the development of an official program in WH which offered a chance to provide rehabilitation care in way that no other providers were at that time. We began taking referrals from urologists, obstetricians/gynecologists, and gastroenterologists, focusing on pelvic medicine issues including pelvic pain and pelvic floor dysfunction. We also cared for the female athlete, osteoporosis, musculoskeletal issues in the aging female, and female cancer survivors left with lymphedema or pelvic issues related to radiation therapy. The program has grown and is comprised now of 6 rehabilitation physicians and 16 pelvic floor physical therapists.

In my new practice, I realized there stunning statistics: (such as)

- 50 percent of pregnant women experience pelvic girdle pain in pregnancy
- One in four women suffer from some type of pelvic floor problem
- 25 percent of women aged 18 to 50 years have chronic pelvic pain lasting > 6 months

Yet when I researched the how and why, the medical literature offered little help.

So I decided I would make it my mission to not only care for these underserved patients, but begin to study why they had problems. Our program obtained two small grants to study musculoskeletal causes of pelvic pain, but our research time was limited by our busy clinical

practice. The turning point in my career came in 2008. I myself was 9 months postpartum and learned about the BIRCWH scholarship through the university. Having been an attending physician already for 8 years, I felt poised to now research the burning clinical questions that predominated my practice. With overwhelming support from my team and my colleagues, I applied for the BIRCWH and was fortunate enough to be awarded the grant in July of 2008. My project is on the use of musculoskeletal ultrasound in the etiology of pelvic girdle pain in pregnancy.

The BIRCWH has given me incredible opportunities. Seventy-five percent of my time is now protected to do research. I am currently enrolled in the NU Masters of Science in Clinical Investigation program to develop my skills in research. I have participated in the BIRCWH women's health lecture series and journal club and the Northwestern K Grant writing seminars and study group. I have attended formal courses in ultrasound training, collaborated with colleagues in radiology, obstetrics, pain medicine, rheumatology, and urogynecology and visited an international mentor in the Netherlands. I have designed and completed a research protocol, constructed a database, and obtained supplementary grant funding for a new portable ultrasound machine for research purposes. I am currently in year 2 of the BIRCWH and I am deeply engrossed in recruitment and collection of data. I am in the process of writing a K23 with the ultimate goal of RO1 funding to determine the mechanisms involved in the etiology of pelvic pain. My hope is that with such clarity we will provide mechanistic based treatments for patients and move towards early diagnosis and treatment of acute pelvic pain to prevent chronic pelvic pain.

I am a physician, but I am also a mother, a daughter, a sister, and a wife and there are times when I too have been a patient. I am passionate about the profound women's health issues we speak about today. I am a doctor that believes that women should not stand for lack of diagnoses and unclear explanations for problems. Women deserve to have all disabilities addressed, those that are visibly apparent and those that are hidden. I believe that to truly provide our patients with outstanding care, clinicians must persist in their pursuit of patient-oriented research. I will be forever grateful for the tremendous support of the Rehabilitation Institute of Chicago, Northwestern University BIRCWH program led by Drs. Dunaif, Woodruff, and Urbanek and to the NIH and the Office of Research on Women's Health for supporting not only my research endeavors but the work of others who share with me this passion in women's health.

ELIZABETH KISSLING, PH.D.

Society for Menstrual Cycle Research

Society for Menstrual Cycle Research—Priorities for Women's Health Research

Preface: The Society for Menstrual Cycle Research

Founded in 1979, the Society for Menstrual Cycle Research (SMCR) is a nonprofit, interdisciplinary research organization whose members have made significant contributions to menstruation research. We strive to be the source of guidance, expertise, and ethical considerations for researchers, practitioners, policymakers, and funding resources interested in the

menstrual cycle. Our membership spans discipline, professional responsibilities, and geography to provide woman-centered perspectives on menstrual experiences. The purposes of the society are to identify research priorities; to recommend research strategies; to promote interdisciplinary woman-centered research on the menstrual cycle; to provide a formal communication network to facilitate interdisciplinary dialogue about menstrual cycle research in the context of women's health over the lifespan; to examine the practical, ethical, and policy issues surrounding menstrual cycle research; to generate and exchange information and to promote public discussion of issues related to the menstrual cycle; and to influence public policy for the enhancement of women's health.

We endorse the four overarching themes identified by NIH in 2009 for addressing research on women's health: Lifespan, Sex/Gender Determinants, Health Disparities/Differences and Diversity, and Interdisciplinary Research. In SMCR, we are particularly aware of the stigma and silence surrounding menstruation and reproductive health issues. We believe that context, wellness, and prevention must be highlighted when priorities for women's health are discussed and established in order to develop effective and realistic health strategies.

SMCR Recommendations for Research Priorities

Medical research on sex hormones must be seen in terms of women's health, rather than disease. Menopause is not a disease of estrogen deficiency, but a normal phase of an adult woman's life, nor is menstruation a disease requiring medication or other treatment.

Menopause and Estrogen Therapy[1]

The Women's Health Initiative (WHI) research provided strong evidence that hormone therapies are not safe and effective for prevention of chronic illness and that menopause is not an estrogen-deficiency disease. Prior to WHI, many in the medical community had advocated use of hormones for disease prevention notwithstanding a lack of experimental data pertaining to this, based on weaker kinds of evidence and their professional judgment. WHI provided strong clinical trial evidence, using the hormones that were most commonly prescribed in the United States at the time of the study, that neither estrogen alone, nor in combination with a progestin, prevents heart disease. In addition, when several outcomes were considered together, overall harm outweighed overall benefit. The conviction that hormones prevent disease relied on the idea that menopause is a disease state in which estrogen deficiency creates vulnerability to a wide range of illnesses, including heart, bone, and brain disease. The WHI results therefore also supported SMCR's position that menopause is a normal phase of a woman's life and not an estrogen-deficiency disease that requires so-called hormone replacement to prevent serious chronic illnesses.

A criticism of WHI that has been given great credence is the "timing hypothesis," which asserts that significant disease prevention was not observed in this study because the participants were too old. In this view, hormone therapy must be begun soon after menopause (or even in perimenopause) in order to be effective for disease prevention; if women begin hormone therapy many years after menopause, it is believed to be already too late to be helpful and, because of incipient development of disease, can be actually harmful. This idea is being generalized to a variety of chronic illnesses of old age, including heart and brain disease.

SMCR regards the credence given this emerging estrogen "timing hypothesis" with alarm. Some professional groups have already incorporated this possibility into their recommendations (for example, the North American Menopause Society), and many professional articles reference it. Yet the research supporting the hypothesis is not strong data and often is not even acceptable as reliable data, when considered by the normal standards used by researchers. For example, conclusions are drawn from data that are not statistically significant or from research that is underpowered. Conclusions are drawn from markers of disease rather than from disease outcomes. Research data inconsistent with the hypothesis are not considered; for example, studies suggesting that younger women also have negative health effects from hormones. Data are inaccurately over-interpreted; for example, assuming that an observation in younger women will continue to be found as they age. Conclusions are drawn based on possible positive coronary artery outcomes while not simultaneously taking into account negative cardiovascular effects such as stroke and serious blood clots. Data on possible other negative outcomes like breast cancer are not given great credence. Further, the WHI study participants in fact reflected the demographic of hormone users when the study was started.

Ironically, WHI showed that a set of hypotheses based on weak data, no matter how firmly believed, can turn out to be inaccurate when clinical trial data are collected. We believe that this lesson of WHI should be remembered. The continued belief in the underlying idea that menopause is an estrogen-deficiency disease, rather than strong evidence, has led to the hypothesis that hormone therapy immediately after menopause will prevent a broad variety of diseases.

This shows that more work on the natural history of menstruation, ovulation, and changes throughout the menopause transition is needed; such research must be conducted in a population-based context. Understanding the natural history of menopausal symptoms requires long-term data on numerous women from diverse backgrounds. In addition, research on medications that could be prescribed to large numbers of otherwise healthy women must use randomized, placebo-controlled trials.

SMCR advocates that avoiding harm should be a primary consideration in preventive health care and in research on preventive health. Even if it were true that hormone therapy could prevent heart and other chronic diseases, a prevention tool that requires medicating large numbers of women for long periods of time relative to the number of women who will benefit is not effective prevention. This is especially true if the medication in question carries risks of serious outcomes like strokes and blood clots. While risks are not large enough to preclude treating symptomatic women, these medications are inappropriate as a prevention tool. Further, research on estrogen progestin therapy and estrogen therapy for menopausal women has repeatedly caused harm to study participants, in WHI and in previous studies.

A 2005 NIH State-of-the-Science conference recommended that menopause be de-medicalized. The conference statement read as follows:

"Menopause is 'medicalized' in contemporary U.S. society. There is great need to develop and disseminate information that emphasizes menopause as a normal, healthy phase of women's

lives and promotes its demedicalization. Medical care and future clinical trials are best focused on women with the most severe and prolonged symptoms."[2]

The statement also asserted that much more research is needed to clearly define the natural history of menopause, associated symptoms, and effectiveness and safety of treatments for bothersome symptoms. Natural histories are important for both science and policy. Knowing how many women transit menopause with few or no symptoms and how many manage menopause largely on their own, can lead to public health information that empowers women and increases their self-reliance.

We endorse these recommendations and believe they are crucial in studying the relationship of hormones and health. We also believe that menopause and aging need to be divorced in order to develop effective strategies for disease prevention and treatment, with continued research on lifestyle and other interventions.

Cycle-Stopping Contraceptives[3]

It is the position of the Society that menstruation is not a disease, and that further research on the potential health risks and long-term safety of cycle-stopping contraception is needed. While some research exists on endometrial safety and on patterns of unexpected and expected bleeding, long-term studies that address potential risks beyond the uterus, such as breast, bone, and cardiovascular health, are still needed. Furthermore, there is an urgent need for studies that address impacts on adolescent development and bone density over time, since young women and girls are a target market for cycle-stopping contraceptives.

It is important to note that cycle-stopping contraceptives do not only reduce or eliminate menstrual bleeding, but also suppress the complex hormonal interplay of the menstrual cycle. The impact of this cycle on women's health is not completely understood.

It is also critical to address the social, psychological, and cultural implications of menstrual suppression as well as the biomedical effects. We remain concerned that campaigns used to market cycle-stopping contraception depict the menstrual cycle as abnormal, undesirable, unnecessary, and even unhealthy. Messages that women's natural functions are defective or need to be medically controlled can lead to negative body image, especially in young women.

Arguments for cycle-stopping contraception often describe debilitating menstrual cramps and heavy flow as indications, but promote routine use by all women who would prefer not to menstruate for matters of convenience. Cycle-stopping contraception may be useful for some medical conditions (such as severe endometriosis), but we caution against its use as "a lifestyle choice" until safety is firmly established. Although women in the United States have been using oral contraceptives for nearly 50 years with no large-scale disasters, there is no precedent for continuous use of such large doses of hormones from the teen years to menopause. Women currently use oral contraceptives from their teens until their late twenties or early thirties, when they typically complete their families, and then they choose a more permanent method of contraception (either tubal ligation or vasectomy for their male partners).

Hormonal contraception is a valid and appropriate choice for many women. But historically, nasty surprises with hormonal therapies for women (e.g., heart disease and hormone therapy for menopausal women, the link between oral contraceptives and blood clots, and between diethylstilbestrol and multiple health problems) have taken many years to surface. We note that Lybrel, Seasonale, and other contraceptives marketed for their cycle-stopping properties underwent clinical testing for only 1 year. Additionally, when any medication is evaluated for healthy women, the potential risks should be weighed more heavily than in situations when medication is considered to treat a disease. Menstruation is not a disease.

Some have claimed that women should be "free" to choose cycle-stopping contraception. However, informed choices are only possible when reliable, accurate, and comprehensive information is widely available.

Conclusions

We appreciate the opportunity to present our positions on women's health research to the ORWH at NIH. As indicated above, we endorse the four overarching themes identified by NIH in 2009 for addressing research on women's health: Lifespan, Sex/Gender Determinants, Health Disparities/Differences and Diversity, and Interdisciplinary Research. Medical research on sex hormones must be seen in terms of women's health, rather than disease. Future NIH research on women's health must include increased attention to prevention and wellness and be appropriately situated in the diverse social and cultural contexts of women's lives and women's bodies. We in SMCR are keenly aware of the stigma and silence surrounding menstruation and related health issues and are concerned about the implications of such taboo for women's access to accurate medical knowledge and health care.

Ultimately, the evaluation of and recommendations for women's health must be made on rigorous scientific standards, incorporate prevention and wellness along with diagnosis and treatment, and reject underlying or explicit assumptions that menstruation and menopause are diseases or deficiencies.

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ANNABELLE S. VOLGMAN, M.D., FACC

WomenHeart: The National Coalition for Women With Heart Disease

Increasing the Participation of Women in Clinical Trials

WomenHeart: The National Coalition for Women With Heart Disease was founded in 1999 by three women heart attack survivors. WomenHeart is the Nation's only patient-centered advocacy organization. Our mission is to improve the health and quality of life of women living with or at risk of heart disease and to advocate for their benefit. We advocate on policies affecting women with heart disease such as healthcare reform, research funding, and smoke-free environments, and today urge you to take action to increase the participation of women in clinical trials.

We're the "boots on the ground" in the fight against heart disease. WomenHeart runs the only national network of patient-led support groups for women with heart disease. And, we educate tens of thousands of women annually through our national network of incredible, courageous patient volunteers—our WomenHeart Champions—who are trained in the science of heart disease, but utilize the power of their personal stories to reach other women in a way no one else can. There are 400 WomenHeart Champions trained nationwide, 17,000 members and electronic newsletter subscribers, a Web site with 125,000 unique visitors monthly, and an online patient community with more than 1,400 registered members. Our WomenHeart Champions run 62 local Support Networks, which meet monthly and are growing. Finally, WomenHeart is a founding partner of the National Heart, Lung, and Blood Institute's The Heart Truth/Red Dress campaign.

Our message is simple. Prevention and early detection, accurate diagnosis, and proper treatment for heart disease must be accessible to all women. WomenHeart educates women on the importance of taking charge of their heart health and trains WomenHeart Champions (all heart disease survivors) to carry this message to women in local communities and through the media. We support women living with heart disease and connect them with one another. We also advocate for research funding and policies that meet the needs of women with heart disease.

WomenHeart provides education, training, and support through our key programs:

1. Science & Leadership Symposium at the Mayo Clinic
2. Community-based peer support networks, education, and outreach activities
3. Online patient support services
4. Red Bag of Courage®
5. Advocacy institute and policy advocacy

A decade ago, heart disease was primarily recognized as a man's disease. Less than 30 percent of women surveyed knew that heart disease was the #1 killer of women. Even more disturbing, less than 17 percent of cardiologists were aware that cardiovascular disease (CVD) was the leading cause of death among women, and there were even fewer women than

there are now included in clinical trials. As a result, late detection, inaccurate diagnosis, and improper treatment were all too common among women.

Recently published studies have underscored, yet again, that cardiovascular disease research must more effectively and aggressively target women if it is to produce results that lead to improved prevention and early detection, accurate diagnosis, and proper treatment for women. Specifically, one study found that women have been underrepresented in National Institutes of Health–supported cardiovascular randomized controlled trials conducted in the past 10 years, despite a 1993 Federal law requiring clinical trials to include a significant proportion of women. Through surveys and conversations with our members, we have identified specific barriers to the enrollment of women in clinical trials, ranging from a lack of information about the availability of clinical trials by women patients and their healthcare providers, to study designs that exclude women heart patients due to their medical conditions, medications, or history. Pragmatic concerns by women patients about how participation in a clinical trial will affect their health insurance coverage and the logistical difficulties of transportation and childcare also have an adverse effect on participation rates.

The impact of failing to overcome these barriers and significantly increase the number of women in clinical trials has contributed to a substantial deficit of gender-based knowledge about everything from the "typical" heart attack symptoms in women to the risks and benefits of commonly used diagnostic tests and therapies. Exacerbating this problem are the serious lapses in the U.S. Food and Drug Administration's enforcement of its own rule requiring new drug applicants to submit data by sex, age group, and race. Far too many applicants fail to comply, resulting in sorely inconclusive evidence of gender-specific disease indicators and inadequate guidelines for the clinical treatment of women. This translates to women being treated with drugs, procedures, and devices that have been shown to be effective in men but not studied in a sufficient number of women.

Another new study reveals how this knowledge deficit contributes to persistent disparities in the care women heart patients receive as compared to men. The study shows that women experiencing a major cardiac event are 50 percent more likely than men to be delayed by emergency medical services (EMS) from reaching the hospital and receiving crucial treatment.

The study authors suggest that these treatment delays may be due to women's cardiac symptoms differing from men's and that both women patients and emergency medical services personnel do not recognize the health event as cardiac related. Another study, published in 2009, showed that women with acute coronary syndrome were less likely than men to undergo cardiac catheterization and other therapies; receive beta-blockers, statins, and other medications; or be discharged with evidenced-based cardiac therapies. The reasons for these disparities in care are not insurmountable. Conducting research that accurately reflects the epidemiology of the disease in women, improving healthcare provider education, and engaging more informed and empowered women patients could translate into improved care outcomes, reduced hospital stays, and lives saved.

As the Nation's only patient-centered advocacy organization for women with heart disease, WomenHeart is committed to meeting these challenges in order to ensure that all women live longer, healthier lives. Community education, patient support, and advocacy are integral to our organization's efforts. We depend heavily on a corps of 400 WomenHeart Champions volunteers, all heart disease survivors trained in a unique collaborative program with the Mayo Clinic to lead community-based, public education forums and discussions about cardiovascular health, lead local support groups across the country, and moderate online support programs to help women living with heart disease connect with and support each other. Together with our outreach efforts and active Web site, http://www.womenheart.org, we are working to inform all women about heart disease, empower them to reduce their risks, emphasize the importance of research by sharing latest findings, and urge more women to participate in clinical trials.

WomenHeart is also a chief advocate for increased research and prevention funding and policies that will better address the needs of women with heart disease. We are making every effort to educate our members on the importance of research and encourage women to get involved in clinical trials. Through our Web site and newsletters, we disseminate the latest research findings to make the connection between data and its impact on quality of life.

While the death rate for heart disease in men has declined by 17.5 percent over the past 25 years, the rate for women declined by only 1.5 percent. The heart disease rate for women ages 35 to 44 actually rose from 1997 to 2002. Here, the evidence is clear; we are losing ground in the fight against women's heart disease. The action steps we must take, however, are equally clear, and WomenHeart is eager to partner with the translational research community to achieve them. We urge you to take the following steps to increase participation of women in clinical trials, which will ultimately decrease gender disparities in treatment.

- Ensure that physicians and hospitals inform women about the availability of clinical trials and provide information regarding access
- Target women's heart programs for trial recruitment
- Design and ensure that studies are sufficiently powered by women to allow statistical significant reporting of sex-specific outcomes
- Ensure that gender use and applicability are examined in all phases of the clinical trial process for drugs, devices, and other treatments
- Consider ways to increase the number of trials with appropriate gender representation
- Require that federally reported healthcare data be stratified by gender, race, and ethnicity
- Improve and expand screening for low-income women at risk for heart disease and stroke

We look forward to working together to help all women improve their heart health.

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LISA MARTINEZ, J.D., RN

The Women's Sexual Health Foundation

Sex Hormones and Disease and the Impact on Sexual Function

There are many diseases and conditions that may be impacted by sex hormones. Furthermore, sex hormones and diseases can have a relationship to female sexual dysfunction, which often goes unrecognized. Female sexual dysfunction, known as FSD, is a relatively common health concern of women. The Mayo Clinic states that as many as 4 in 10 women may suffer from FSD.[1] Studies have shown that FSD and other sexual problems have been linked to a "diminished quality of life, low physical satisfaction, low emotional satisfaction, and low general happiness."[2] Other health experts agree that "[f]emale sexual dysfunctions (FSDs) are very prevalent, multifaceted problems that continue to be under-recognized and undertreated."[3]

Most healthcare providers do not address FSD with their female patients during regular medical visits. One study concluded that more than half of their respondents were not queried about their sexual health during their visit with their practitioner.[4] In order to investigate this matter further, The Women's Sexual Health Foundation (TWSHF) designed a survey that inquired about perceptions, emotional responses, and possible discussion of FSD during visits with their medical practitioner. The 18-item survey was posted on TWSHF's website at http://www.TWSHF.org. The survey contained demographic information and questions on women's beliefs specific to communication with their provider and care relating to female sexual health problems. A total of 391 women responded to the survey. Women from ages 21 to 80 took the survey, and most of the women were well educated (college or above). According to this study, less than 9 percent of the respondents stated their healthcare provider always initiated questions about sexual health difficulties during an annual office visit.

The results of this survey raised other questions relating to diseases, sex hormones, and sexual dysfunction, such as the impact of adjuvant hormonal therapy and chemotherapy on sexual function in the breast cancer patient. For many, breast cancer is a chronic disease with approximately 2,533,193 breast cancer survivors alive as of January 1, 2006, in the United States according to the National Cancer Institute data. However, one consequence of cancer treatment that is often not discussed with cancer survivors is that of sexual function and intimacy. Research shows that sexual dysfunction after various cancer treatments can range from 40 percent to 100 percent.[5] Approximately 50 percent of female breast cancer survivors have long lasting sexual dysfunction.[6,7]

Cancer and cancer treatments such as chemotherapy and adjuvant hormonal therapy can impact a woman's ability to enjoy sex. These treatments can cause various side effects, from low desire, decreased arousal, urogenital atrophy, and vaginal dryness that leads to painful intercourse and even vaginal bleeding.[8] Although sexual dysfunction as a result of vaginal dryness and dyspareunia is a common complaint of women who have experienced chemotherapy-induced menopause and those women who are receiving adjuvant hormonal therapy such as aromatase inhibitors and tamoxifen, there is no consensus as to whether vaginal estrogen products are safe to use in breast cancer patients with estrogen receptor positive tumors. Healthcare providers will recommend lubricants and nonhormonal vaginal moisturizers as a first-line therapy, but these products are not always effective in this patient population. There is a concern that it may be unwise to use topical vaginal estrogen in women who are taking aromatase inhibitors, where such concerns have not been raised in nonbreast cancer patients.[9]

In the study by Kendall and his colleagues,[9] they found estradiol levels increased from a mean baseline level of 5 pmol/l to a mean of 72 pmol/l at week 2, and then decreased at week 4 to a median of 16 pmol/l after the women in the study had been treated with Vagifem, a vaginal estrogen. Two women had high estradiol levels after 7 weeks in the study. Of concern is whether even minute changes in serum estradiol levels from vaginal absorption of topical estrogen replacement agents increase breast cancer recurrence. The use of aromatase inhibitors continues to increase and further studies are needed to assess the impact of the use of vaginal estrogens as it relates to the effective and safe management of a woman's sexual and

urogenital health in the breast cancer patient. Funding for such research is needed. These are important questions, and women have every right to have them addressed fully with evidence-based research.

What We Hear From Women

We have heard from many women and their partners relating to female sexual health problems. These stories are heart wrenching and have a common theme: women are devastated; suffer in silence; feel very much alone in their journey to find the right answers, care, and treatment; and wish that their sexual health would be taken seriously.

For women who have had cancer, whether breast cancer, gynecological cancer or other cancers, the message that they are sometimes given is that they should be happy that they are alive. Yet the vast majority of these women will struggle with regaining their sexual health due to chemotherapy and adjuvant hormonal treatments.

For women in relationships, this impacts not only them, but also their partners who often feel helpless and equally devastated, many times blaming themselves. Partners express the personal and emotional rejection they feel. Some keep this pain to themselves because it appears that there is no help available.

Research

Funding for research studies is needed to address the safety of the use of vaginal estrogens in breast cancer patients and to understand the impact of sex hormones in women in relationship to cancer treatments and female sexual dysfunction.

About The Women's Sexual Health Foundation

The Women's Sexual Health Foundation (TWSHF) was founded in 2003 as an international nonprofit organization with an Advisory Board of international experts in the field of sexuality and women's sexual health.

The mission of The Women's Sexual Health Foundation is to provide support in the following ways:

- Providing educational information on the causes, treatments, and latest research in sexual health issues to women and to healthcare professionals
- Supporting a multidisciplinary approach in treating women's sexual health concerns
- Offering resources for women experiencing sexual health difficulties as well as for their partners, family, and friends
- Advocating funding for research to advance knowledge in sexual medicine
- Increasing worldwide awareness on the subject of women's sexual health

To advance its mission of education and support, The Women's Sexual Health Foundation maintains a Web site at http://www.TWSHF.org with multiple resources, including educational brochures in several languages on topics such as the various female sexual dysfunctions, how to speak with your healthcare provider about sexual health, and addressing low desire from a multidisciplinary approach. We have cohosted well-attended educational forums with Columbia University College of Physicians and Surgeon as CMEs for healthcare professionals and similar programs for the public. TWSHF presented its first media award in 2009. This award recognized an outstanding media professional whose work has broadened the knowledge and understanding of women's sexual health. The Women's Sexual Health Foundation collaborates with other patient advocacy organizations on issues related to female sexual health and various female sexual dysfunctions.

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KATHIE DUPREY

Self

Infectious Determinants of Chronic Disease

The lives of women are multidimensional and so should be the research that affects them. While there are other agencies that cover psychosocial research, the National Institutes of Health (NIH) focus on biomedical research can and should be unparalleled.

Although the "germ theory" may be widely disparaged in some circles, conflicting ideology should never be an excuse for the scientific failure to rigorously examine infectious determinants of complex and chronic diseases, immune-mediated diseases, and autoimmune diseases, many of which disproportionately affect women.

Not all chronic conditions will have infectious agent roots, but the failure to fund such research based on past failures due to undeveloped technology or differing ideology runs the risk of slamming the door in the face of biomedical progress. Many a woman died of puerperal fever while the medical establishment continued to ignore the research of Ignaz Semmelweis, instead spouting their unproven theories of bad mother's milk. Ignorance was not a viable excuse then and it shouldn't be one now.

Imagine a world where women and their organic diseases are taken seriously, where such diseases are not ascribed to unproven hypotheses of hysteria, "medicalization," or "disease mongering," but rather are thoroughly investigated without bias using modern techniques focusing specifically on women.

Whether triggered by microbes through acute initial infection, chronicity related to the continuous reactivation of latent viruses, or even as a complication of disease, biomedical research has made great strides in detection and evidence of causation in the past decade. The NIH needs to build on that progress.

This research, combined with immunology and genetics, has the potential to better the lives of not only women, but all people throughout the world.

As Dr. Siobhan O'Connor of the Centers for Disease Control and Prevention (CDC) has noted, "...Not infrequently, infection may simply represent the first misstep along a continuum from health to long-term illness and disability. Preventing or treating infection or the immune response to infection offers a chance to disrupt the continuum, avoiding or minimizing a chronic outcome."

Women are much more than endocrine systems or baby machines. A recent study shows that women-owned firms have an economic impact of nearly $3 trillion. Women-owned businesses produce employment for 23 million people, 16 percent of all U.S. jobs, both direct and indirect. When their health prevents women from active participation in the economy, more than just women suffer.

The rate of disability among working women in the United States has grown almost twice as fast as the rate among working males during the past decade (over 60 percent and 32 percent, respectively), according to Social Security Administration data. The financial risks of disability can be severe and long lasting. Disability is one of the leading causes of personal bankruptcies and mortgage foreclosures in America.

Just as healthcare reform is more than just politics, both prevention and cure require more than just lip service. Unbiased biomedical research is an ethical and economic necessity.

And it needs to happen now. The current NIH research funding process is far too cumbersome. Researchers and scientists are not bureaucrats, and their time is better spent on research than paper work. How many lives are diminished by disease; how much money is lost by our economy and; yes, even how many of the brightest scientific minds are lost to private enterprise while research proposals are tied up in red tape, bias, and narrow agendas month after month, year after year?

Rather than let history determine that the NIH consistently ignored the impact of disease on women, failed to expedite biomedical research, or failed to fully investigate microbial causality, the ORWH and the NIH can choose to forge a future that precludes such a history. And the time to act is now.

Public Testimony
Emory University School of Medicine
Atlanta, Georgia
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Centers for Disease Control and Prevention

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Jackson Heart Study

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Centers for Disease Control and Prevention

The Well-Integrated Screening and Evaluation for Women Across the Nation (WISEWOMAN) Program

To address the high burden of cardiovascular disease, the Centers for Disease Control and Prevention's (CDC's) Division for Heart Disease and Stroke Prevention (DHDSP) translates prevention research into public health practice and provides national and State leadership to help reduce the burden of heart disease and stroke. The Division currently funds health departments in 41 States and the District of Columbia to conduct heart disease and stroke prevention programs; another six States are also funded for Paul Coverdell National Acute Stroke Registries. DHDSP funds 21 WISEWOMAN programs, operating in 20 States and inclusive of two tribal organizations. The Division also funds national data collection, applied research, and evaluation initiatives.

Although WISEWOMAN originated as a research project, today it is a public health practice program. WISEWOMAN provides heart disease and stroke risk factor screenings, healthy lifestyle programs, and healthcare referral services to uninsured and underinsured women aged 40–64 years. To be eligible, participants must first be enrolled in CDC's National Breast and Cervical Cancer Early Detection Program. Local programs provide preventive health services that include screening for high blood pressure, high blood cholesterol, diabetes, smoking, and lifestyle interventions. WISEWOMAN programs partner with community-based organizations to help expand the reach of their services and coordinate patient healthcare referrals.

The goals of the program include maximizing the reach of the program (to provide services to as many women as possible); decreasing the heart disease and stroke risk factors of the WISEWOMAN population; working to eliminate disparities (by serving those most in need); maximizing the number and variety of settings that deliver WISEWOMAN services; ensuring that WISEWOMAN is delivered as intended; and sustaining the benefits of WISEWOMAN over time. The program guidance provided to grantees occurs within a four-component framework; the components are program management, direct services, evaluation, and partnerships.

WISEWOMAN Program Evolution

Phase I: Research (1995–1998)

Three research programs were funded to compare the effectiveness of enhanced lifestyle interventions (LSIs) and LSIs with minimal or usual care in reducing cardiovascular risk among low-income, under- or uninsured 40 to 64-year-old women.

Phase II: Research and Public Health Practice (1999–2007)

Congress authorized an expansion of WISEWOMAN that allowed CDC to fund up to 15 organizations. CDC began funding both research and nonresearch, or public health practice, WISEWOMAN programs. The research programs maintained their original design. In contrast, the nonresearch programs focused on service delivery and evaluated the feasibility of implementing evidence-informed lifestyle interventions in local settings; they did not use a control group as the research programs did.

Phase III: Public Health Practice (2008–present)

Under a new Funding Opportunity Announcement (FOA) in 2008, the program expanded to 21 programs. Along with this FOA, the Program moved completely to a nonresearch, or public, health practice design that focused on delivery of a proven concept.

A comprehensive program evaluation plan was developed in 2008, began implementation in 2009, and will occur annually. The purpose of the evaluation is to generate results and recommendations to assess the outcomes and impact of the program, monitor the program's progress toward reaching its goals, and uncover the program's best practices and improvement strategies. This purpose corresponds to the three-pronged evaluation approach that includes the following:

Comprehensive Evaluation

- Demonstrates program outputs and outcomes
- Tracks output and outcome indicators annually
- Data sources: Minimum Data Elements (MDEs), Program records, performance assessment tool (PAT), and funded program evaluations

Program Monitoring

- Provides regular documentation of Program progress
- Serves as a feedback mechanism
- Offers Program oversight for purposes of management, improvement, and accountability
- Data source: MDEs and PAT

Program Progress and Effectiveness Assessment (PPEA)

- Allows for in-depth assessment of program elements
- Creates opportunity for program improvement or enhancement
- Data Sources: Various situation-specific tools for looking at program characteristics, program effectiveness, best practices, and program improvement

The evolution of the WISEWOMAN program from research to public health practice has resulted in a dedicated focus on program evaluation. However, the need continues to better understand women's cardiovascular risks, associated behaviors, and effective lifestyle interventions, particularly with specific population groups. Additionally, understanding the relationship of the community and environment in reaching, screening, and intervening with the WISEWOMAN population for improved health outcomes, remains.

FRANCES HENDERSON, ED.D., RN

Jackson Heart Study

Strategies for Women's Health Research: Moving Into the Future

The Jackson Heart Study (JHS) is the largest single-site, prospective, epidemiologic investigation of cardiovascular disease among African-Americans that has ever been undertaken. It is a population-based, observational, longitudinal study. Since there is a greater prevalence of cardiovascular disease in African-Americans, the purpose of the Jackson Heart Study is to explore the reasons for this disparity and to uncover new approaches to reduce it. The primary objective of the Jackson Heart Study is to investigate the causes of cardiovascular disease (CVD) in African-Americans to learn how to best prevent this group of diseases in the future. The four major aims of the Jackson Heart Study are to accomplish the following:

1. Establish a single-site epidemiological study of CVD in African-American men and women by including and expanding the Jackson Atherosclerosis Risk in Communities (ARIC) Study
2. Identify risk factors or factors for development and progression of CVD with an emphasis on manifestations related to hypertension, (such as left ventricular hypertrophy, coronary heart disease, heart failure, stroke, and renovascular disease) in African-Americans
3. Build research capabilities in minority institutions at the undergraduate and graduate levels by developing partnerships
4. Develop programs to attract minority students and prepare them for careers in public health and epidemiology

The Jackson Heart Study exemplifies a unique collaborative model among three institutional partners, the Jackson community, and the National Institutes of Health to discover and test best practices for eliminating health disparities. The partnering institutions are two historically Black institutions—Jackson State University, which is a State-supported urban university; and Tougaloo College, a private, church-supported college. The University of Mississippi Medical Center, the only medical center in the State, is the third partner. The Jackson Heart Study highly values the role of the community working in concert with the participating institutions, funding agencies, collaborators, and consultants; collectively, this makes the Jackson Heart Study, in the words of the Principal Investigator Dr. Herman Taylor, "a study for our time...It is possibly an evolving model for community-centered research into public health problems, a platform suitable for use in other communities, other populations, and other geographic regions. It is one answer to the call to action by the Centers for Disease Control and Prevention, the National Institutes of Health, and the American people to address disparities in cardiovascular health among American populations"[1]

Mississippi, the home of the Jackson Heart Study, is the State with the Nation's worst cardiovascular disease statistics. According to the Mississippi State Department of Health, "Cardiovascular disease, including heart disease and stroke, is the leading cause of death in

Mississippi, accounting for 43 percent of all deaths in 2001. More Mississippians die each year from cardiovascular disease than from all types of cancer, traffic injuries, suicides, and AIDS combined. Mississippi's CVD mortality rate is, and has been for many years, the highest in the Nation" (http://www.msdh.State.ms.us/msdhsite/-static/43.0.91.149.html). Cardiovascular diseases are also leading causes of chronic ill health.

According to the Cardiovascular Report Card for Mississippi 2005–2006 published by the Mississippi Department of Health, "African-American women who have the highest prevalence rates for five of the six major CVD risk factors need to be targeted urgently for intensive health education and promotion regarding CVD prevention. It is quite possible in the near future that CVD mortality rates for African-American women will exceed those for White men; and the trend lines for African-American women and White men will cross—despite the fact that the prevalence of cigarette smoking (the single most important risk factor for CVD) is much lower in African-American women." (http://www.HealthyMS.com)

Three counties—Hinds, Madison, and Rankin—make up the Jackson Mississippi metropolitan statistical area that is home to the 5,301 participants who were recruited into the study between September 2000 and March 2004. The Jackson Heart Study celebrates its 10th anniversary on September 25, 2010. The Study is now conducting the third in a series of three comprehensive exams.

Phase One of the study began in September 2000 and ended in March 2004. The initial clinical examination comprised a physical assessment inclusive of blood pressure, sitting and ambulatory; body mass index; electrocardiography, echocardiography, and carotid ultrasound; pulmonary function; and blood and urine analysis. It also included a series of questionnaires inclusive of medical and family history, lifestyle factors such as diet and physical activity, and sociocultural factors such as stress and discrimination. Phase Two of the Jackson Heart Study began June 1, 2005, and extended though December 26, 2008.

Phase Two, which began October 2005 and ended December 2008, comprised the assessment of blood pressure, height, weight, interim medical history, a medication survey, and venipuncture for glucose and cholesterol; spot urine; and a computed tomography scan of the chest and abdomen to assess coronary calcium and abdominal fat. Magnetic resonance imaging (MRI) is an additional component for Exam 2 and 3 that will assess cardiac structure and function.

Phase Three began February 26, 2009, and will end May 31, 2012. It includes all of the same assessments as in phases one and two, in addition to MRI and selected questionnaires on cognitive function and sleep.

The JHS includes 5,301 African-American men and women between the ages of 21 and 85. There are 3,395 (64 percent) African-American women and 1,907 (36 percent) African-American men in the cohort. The sample comprised four groups: a randomly selected sample of 921 participants (17 percent); a volunteer sample of 1,570 (30 percent); 1,185 (31 percent) previous Atherosclerosis Risk in Communities (ARIC) participants; and a family cohort of 1,626 (22 percent).

A thumbnail summary of findings from seven selected articles from among those published in 2007 through 2009 based on JHS data reveals some that are specific to women. Wyatt et al.[2] found that in a sample of 3,330 Jackson Heart Study women, hypertension prevalence was 64.5 percent; awareness, 89.8 percent; treatment, 86.1 percent; and control, 69.3 percent.

Talegawkar and colleagues[3] found that more women than men reported taking supplements. Also, use of supplements containing beta carotene was higher in women compared with men. Women had higher serum concentrations of high-density lipoprotein cholesterol and total cholesterol compared with men. Fox et al.[4] found that C-reactive protein concentration was significantly related to advancing age, female gender, higher blood pressure, larger body size, glucose measures, current cigarette smoking, higher lipid concentrations, medications for hypertension and high cholesterol, and prevalent cardiovascular disease.

According to Samdarshi et al.,[5] the distribution of normal diastolic function and mild, moderate, and severe diastolic dysfunction was 70.4 percent, 18.0 percent, 10.6 percent, and 0.9 percent, respectively. Participants classified as normal were approximately 9 years younger than those with mild diastolic dysfunction. The age of participants decreased with severity of diastolic dysfunction. There were more women than men who had normal diastolic function or had mild diastolic dysfunction; however, the reverse was true for those with moderate or severe diastolic dysfunction. Taylor et al.[6] found that dyslipidemia was more common in men (compared with women) aged less than 50 years and increased with age in both genders.

Hypercholesterolemia prevalence rates approached 50 percent in women aged more than 65 years. The lifestyle-related attributes found to be related to prevalence were being overweight and less physically active. Awareness of hypercholesterolemia is approximately 55 percent or more in both men and women aged more than 35 years. Treatment rates lag far behind awareness, particularly in younger adult men, and less than 50 percent of women and men aged less than 65 years were treated for hypercholesterolemia.

According to Liu et al.,[7] women had significantly higher levels of plasma leptin compared to men. The prevalence of hypertension, diabetes, and metabolic syndrome in women was higher than in men. High leptin level was significantly associated with stroke in women after adjustment for age, smoking, systolic blood pressure, body mass index, and waist circumference. No significant association was observed in men. No significant association was observed between leptin and coronary heart disease in both men and women.

According to Hickson et al.,[8] among women, current asthma was significantly associated with lower socioeconomic status and pulmonary function, greater anthropometrics, obesity, fair-to-poor perceived general health, hypertension medication use, and diabetes mellitus. In women, probable asthma was also related to lower levels of education and total household income, increased anthropometrics, global stress scores, hypertension medication use, and diabetes mellitus. Statistics and findings related to CVD indicate the need for a focus on the translation of research into practice and prevention for primary care professionals who provide primary care to women. Primary care professionals need to be provided with available resources based

on research to help their women patients modify and manage the risk factors for CVD. They need to have quick, user-friendly access to research findings in a format that is easily translated to patient management approaches. Study participants and the community at-large need to know how to use pertinent study findings in their day-to-day health-related activities to stay well, prevent disease, and prevent the complications of disease such as cardiovascular disease. For health professionals, practice refers to the process they use to assess, diagnose, treat, and refer their patients. For all groups, prevention refers to the use of health education to focus day-to-day health practices on behaviors that reduce or eliminate the risk factors related to CVD.

In 2006, a pilot substudy was conducted that engaged 60 non-Jackson Heart Study community participants in a 6-week program of healthy lifestyle interventions and focus groups to identify the barriers and motivators for engaging in a self-managed program of positive lifestyle changes. While changes in knowledge, exercise behaviors, perception of health-related quality of life, and body weight were documented, seven barriers and eight motivators were identified. The seven barriers were habit/routine, time, making excuses, circumstances, cost, family, and self. The eight motivators were self-awareness/self-responsibility, knowledge in relation to power, self-monitoring of risk factors, family history, fear of consequences, reinforcing what is known, opportunities to pass on lessons learned, and health promotion/illness prevention.

The following quotes from focus group participants, most of whom were women, indicate that the program did have an empowering effect:

- "The program is long overdue because I know we oftentimes hear that knowledge is power, but application of knowledge is what is empowering, not just the knowledge itself."
- "That is access to the power, but the power of that knowledge comes in the application by implementing the things we learn to live longer and live long enough to translate that lifestyle into the next generation."
- "I think knowledge is power and the more we learn about our bodies and what we need to live healthier, we'll do better."

Consistent with its valuing of the community, which it demonstrates by engaging community representation in activities throughout the study, the Jackson Heart Study applies several key principles of community-based participatory research.

For example, community-based participatory research recognizes community as a unit of identity. It builds on strengths and resources within the community. It facilitates collaborative, equitable partnership in all phases of the research, involving an empowering and power-sharing process that attends to social inequalities. Community-based participatory research promotes colearning and capacity-building among all partners. It integrates and achieves a balance between research and action for the mutual benefit of all partners. It emphasizes local relevance of public health problems and ecological perspectives that recognize and attend

to the multiple determinants of health and disease. Community-based participatory research involves systems development through a cyclical and iterative process. And it disseminates findings and knowledge gained to all partners and involves all partners in the dissemination process.[9] The community-based participatory approach, which is a work in progress for the JHS, could likely be one strategy that will work in engaging women across the lifespan and women from underserved populations in lifestyle behaviors that will reduce the modifiable risks for cardiovascular disease.

The involvement of high school and undergraduate students in a population-based, epidemiological study is indeed novel. As well, it has been highly successful in increasing the number of women students who have been engaged in various aspects of the Jackson Heart Study Scholar's program since 2003, who are enrolled in programs of study leading toward M.D. and/or Ph.D. degrees, and careers in public health and research. Of the 56 Jackson Heart Study Scholars to date, 39 (70 percent) are women and 17 (30 percent) are men. Two women have earned M.D. degrees, while one has an earned Pharm.D. degree. One is enrolled in an M.D./Ph.D. program and one in a Ph.D. program in pathobiology, both at Brown University. Twenty-four are enrolled in a variety of programs in research-related and health-related careers, including medicine, dentistry, pharmacy, nursing, optometry, public health chemistry, and biomedical research.

This testimony is in firm support of including among the strategies for women's health research for moving into the future, recommendations related to the following:

1. Gender-specific data and State registries on incidence and prevalence of various types of cardiovascular diseases (we were unable to find these data among our sources in Mississippi)
2. Translation of research into practice and prevention
3. Community-based participatory approaches to engaging researchers and participants
4. Qualitative methods of data collection and analysis
5. Continued focus on building pipelines from high school to graduate and medical school to promote the engagement of women in careers in the biomedical sciences

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SHARONNE HAYES, M.D.

Mayo Clinic and Foundation

Mayo Clinic Public Testimony on Priority Initiatives for Improving the Cardiovascular Health of Women for the Office of Research on Women's Health

I am Dr. Sharonne Hayes, representing the Women's Heart Clinic and Office of Women's Health at the Mayo Clinic, whose mission is to improve the health and care of women through clinical practice, education, and research. Mayo Clinic appreciates the opportunity to participate in this important conversation. Mayo Clinic and Foundation is a nonprofit, multidisciplinary, integrated practice with three primary locations in Rochester, Minnesota; Scottsdale, Arizona; and Jacksonville, Florida; and regional practices in the upper Midwest. As we evaluate the focus areas for discussion at this workshop, Mayo Clinic provides some unique resources and perspectives to women's cardiovascular health, including the following:

- A high-quality, high-volume comprehensive cardiovascular program, with clinical and research strengths in all relevant areas, including prevention, imaging, heart failure, intervention, cardiovascular surgery, and genomics
- The Mayo Clinic Women's Heart Clinic, specializing in clinical care and research on women
- The long-standing longitudinal Olmsted County Heart Project

- The Rochester Epidemiology Project, which provides a unique integrated electronic medical record–linkage system for study of conditions and treatments in a well-defined stable population
- Integration of research at multiple campuses that triangulate the country and reach unique patient groups, including underserved women in rural America
- Center for Translational Science Activities and robust research programs for cardiovascular diseases and women's health
- Strong, longitudinal partnerships with community and patient organizations, e.g., WomenHeart: The National Coalition for Women with Heart Disease

Cardiovascular disease remains the leading cause of morbidity and mortality in women. An overarching need, if we are to be successful in improving clinical care and cardiovascular outcomes in women, is to address the dearth of preclinical and basic science studies of cardiovascular disease models in female experimental animals. Although it has been 10 years since the Institute of Medicine Report, *Sex Matters, the Biological Basis of Sex-Differences,* basic science has failed to attend to sex differences in experimental design, and study sections have failed to value studies of sex differences. Study sections must become better equipped to evaluate such proposals of sex differences in cardiovascular disease, as these typically require complex integrative physiology utilizing a multidisciplinary approach. Implementing findings from basic science into the clinical arena will require investigators to develop new interdisciplinary approaches and funding to support these types of projects.

The following represent high-priority areas for further study and enhanced funding in order to improve women's cardiovascular health:

1. Hypertensive disorders of pregnancy. These disorders affect the immediate health of the mother, but may also affect the future cardiovascular health of the mother and child. In order to understand these relationships further, we must extend current basic science and epidemiological investigations and create a national database for hypertensive disorders in pregnancy, not only to optimize the study of this condition in mothers, but also to understand the future implications of this condition on their offspring. Additional basic science work is required to provide a better understanding of how medications to treat or prevent hypertension might affect the fetus and future development of the child.
2. Diagnosis, pathophysiology, and optimal management of spontaneous coronary artery dissection. This rare condition makes up only 0.2 percent of all myocardial infarctions, but has a mortality rate of almost 50 percent. Premenopausal women are disproportionately affected, often, tragically, in the immediate postpartum or peripartum period. The etiology, hormonal and genetic influences, risk factors, recurrence rates, and risks of subsequent pregnancies are unknown. A national database, with collection of biological specimens, hormone levels, and genetic material should be created to better understand this condition, since no single center has the patient volume to address these issues. Educational programs for obstetricians should be initiated, since a high index of suspicion is often the only way to make a timely diagnosis.

3. Optimal management and research into cardiovascular disease of the frail and elderly. Care for this growing, but underrepresented, population requires a better understanding of comorbid risks related to treatment, drug dosing and interactions, and the physiological and psychosocial barriers to rehabilitation following an adverse cardiovascular event.

4. Microvascular disease. Although coronary microvascular disease and endothelial dysfunction are more common in women than in men, little is known about the etiology, optimal therapy, or the relationship of microvascular rarefaction to cardiac dysfunction in women (e.g., diastolic heart failure). Many preclinical studies of microvascular disease and animal models of heart failure have been conducted on male animals, so it is critical going forward that preclinical and basic science studies of the disorder include female animals. Extending the findings from the Women's Ischemic Syndrome Evaluation (WISE) to determine optimal disease management and symptom relief is critical to reduce the economic and personal burden of this condition in women.

5. Accurate cardiovascular risk assessment and diagnostic testing in women. There are important limitations of current tools to accurately predict and diagnose cardiovascular disease in women. Research into optimal predictive models and exploration of novel biomarkers to improve risk assessment are needed. Current American Heart Association/American College of Cardiology guidelines recommend the standard exercise treadmill test as the initial diagnostic test in women with chest pain, but no randomized data have demonstrated that outcomes are improved with this approach or with any other imaging modality. Additionally, a number of cardiovascular imaging modalities appear to perform differently in women and present their own sex-specific issues, such as radiation risk and nephrotoxicity. Improved techniques and assessment of comparative effectiveness in women are urgently needed.

6. Challenges in prevention of cardiovascular disease and support of healthy lifestyle practices for women in rural America. In the United States, socioeconomic status and health are linked. Low-income individuals have higher morbidity and mortality and are less likely to have access to healthcare services. Rural poverty is less visible, more severe, and more persistent than urban poverty. Thus, more rural families than urban families experience poor health. They are also more likely to be uninsured or underinsured than their urban counterparts. Rural residents have higher rates of certain types of heart disease, more activity limitations due to chronic health problems, and higher rates of depression and suicide. Demonstration projects addressing the unique needs and challenges of rural women, including employment stability and access to health care and insurance, are critical to improve the overall health of rural women and their families.

7. Assuring a rich and deep pool for future careers for women in science and technology. As the population ages and the number of women living with the burden of heart disease grows exponentially, a shortage of cardiologists and scientists is looming. The only viable way to meet the brain- and man-power need and to grow this critical workforce is to engage more women in science and cardiovascular medicine. This effort will require more aggressive and effective outreach to high-potential young women from diverse backgrounds, a reassessment of current training paradigms for medical and research education, assurance of parity in resources for academic advancement, and

support for innovation. New and flexible models of mentoring, career advancement, and tenure should be explored.

Mayo Clinic is grateful for the opportunity to speak at this forum and contribute to improving care for women while reducing their cardiovascular risk into the future. Our dedicated clinicians and scientists are eager to develop collaborations toward these goals.

DIANA BITNER, M.D.

Michigan State University College of Human Medicine

A Novel Approach of Community-Based and Patient-Directed Care Using Gender-Specific Risk Factor Identification

I represent our community of physicians, midlevel providers, researchers, and students who provide gender-specific care. We are frustrated with the fact that heart disease is often preventable. Most of the 6 million women who present to the emergency room each year with chest pain had no idea they were at risk. I want all women to know their risk and to see fewer women having to make that visit. I would like to present a strategic vision of how the Office of Research on Women's Health (ORWH) working with community systems could achieve these goals.

If "frustration is the mother of invention," then I find myself of late to be a voracious inventor. After 15 years of clinical practice, I am frustrated by the number of women who walk around with preventable illness and comorbidities. It is my duty as a physician to empower them to mitigate these disease processes, so as to improve their quality of life. Surprisingly, medicine remains an aggregate of diagnostic and treatment silos. Lack of information sharing and functional interoperability continue to represent a high hurdle to process improvement. Specifically with respect to women's preventative health, I am frustrated with the slowness of primary care to adopt gender-specific guiding principles. I am frustrated that primary care residents and midlevel providers often receive minimal education regarding gender-specific concerns and are not taught how perimenopause needs to be seen as a period of "last chance." My response has been to develop novel methods using gender-specific principles in a practical way to improve patient awareness of their potential for wellness, risks of disease, and the availability of gender-specific and evidence-based options to improve their quality of life.

There is a gap in day-to-day practice between what is possible for our patients and what happens within the constraints of time, money, and system limitations. We need to bridge the gap. It is time for old wisdom: "To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science."—Albert Einstein. It is time to use facts to find new solutions and become creative within current restraints. In our own survey, most women said they had not considered their health future, but wished for advice on how to gain control. Most women stated they did not understand midlife changes, and most had unresolved symptoms such as weight gain, low energy, decreased libido, unwanted hair growth, surprising mood changes, sleep disturbances, and hot flashes or night sweats. Most revealed that such questions were the main topic of conversation

when together with friends at social gatherings, and no one seemed to have answers. Many thought such symptoms were the reason for disharmony in their relationships and suboptimal performance at work. I believe that if we are to make a real difference in the health of American women, we must connect with them at the most basic level of day-to-day habits and quality of life and use the symptoms of perimenopause to garner their attention and address their potential for future wellness.

At this conference, we all know the statistics. Heart disease is the number one killer of women, and heart-related mortality among women is on the rise, due mostly in part to comorbidities such as smoking, obesity, diabetes, and metabolic syndrome. Efforts to combat these problems are also on the rise. Public awareness has increased with the Go Red Campaign, and ORWH working groups such as this demonstrate the goal of many in health care to make a difference in the health of women. While awareness is improving, I echo the goals of Dr. Carolyn Clancy, "Comparative patient-centered information is essential to translating new discoveries into better health outcomes. (We must) get the right treatment to the right patient at the right time."

In West Michigan, we have started a women's health pilot program called, "W*A*I*Pointes™," standing for "Who Am I?" A patient story will illustrate what we do. One woman in our program joined the pilot, drawn in by the question, "Do you have less energy than you expected at this point in your life?" At quick glance, she was relatively healthy. She works full-time and runs a household. She is socially connected and sees a good internist for regular check-ups. She is active but rarely does aerobic activity due to a busy schedule and fatigue. Her BMI was 30 and her physical exam history was unremarkable. Her lipid profile demonstrated a low HDL and slightly high LDL. She had no real reason for her complaints except "maybe this is normal aging." Within the Pilot, we took a detailed history, including basic habits and diet. Using gender-specific risk identification tools and stratification, including the Reynolds's Score and the Gale Model for Breast Cancer and body fat analysis, she, in fact, scored high risk for heart disease, breast and colorectal cancer and was diagnosed with "pre-diabetes." We were able to identify lifestyle modifications and treatment options that have made her more energetic, and very likely to have saved her from a heart event. She has been referred to specialists within the MMPC Women's Health Network, who have assisted in her evaluation and treatment. She is thankful to the Pilot for "saving her life" and is already feeling better.

Based on initial pilot data, we are ready to participate in the national conversation regarding solutions for preventable illness, including heart disease. We would like to suggest that the ORWH support comparative research in community-based programs and assist in the use of gender-specific risk identifiers to connect with patients, help them to understand their level of risk, and answer questions about daily symptoms. We believe having the support of the ORWH will assist in breaking down silos and open the conversation for new solutions despite the financial, logistical, and cultural barriers that exist.

ELVAN CATHERINE DANIELS, M.D., M.P.H.

Morehouse School of Medicine

Making Healthy Habits a Priority

Good afternoon, I am Dr. Ellie Daniels, Associate Director of Community Oriented Primary Care at the National Center for Primary Care, Morehouse School of Medicine. We are dedicated to improving the health and well-being of individuals and communities; increasing the diversity of the health professional and scientific workforce; and addressing primary healthcare needs through programs in education, research, and service, with an emphasis on people of color and the underserved urban and rural populations in Georgia and the Nation.

I stand before you today to make the case for educating and mobilizing communities as partners in health. We have strong relationships with community-based organizations and institutions such as churches, schools, federally qualified health centers, and other community-based clinicians. Through our work such as the Achieving Functional Health Literacy for ABCD conditions (ABCD Program), which trained church-based community health lay workers (98 percent female) to deliver cardiovascular risk reduction education to members of their congregations, we found that lay persons are eager to learn how to take a more active role in their health decisions. We found that when health conditions are explained in simple terms combined with interactive methods such as learning how to read food labels, home monitoring of blood pressure, and the like, there was a significant increase in cardiovascular disease risk–reduction knowledge after only 6 weeks. We believe that increasing health literacy—the degree to which individuals are able to obtain, process, and understand basic health information and services needed to make appropriate health decisions[1]—is fundamental to primary and secondary prevention of chronic illnesses. Health literacy is a shared function of cultural, social, and individual factors impacted by family and community.

As Americans, if we were to make healthy lifestyle decisions such as adhering to USDA recommended nutritional guidelines, participating in a regular program of physical activity, avoiding tobacco use and moderate consumption of alcohol, we could reduce the risk of our major causes of mortality by 87 percent.[2] I am urging the panel to consider including culturally tailored research focusing on developing healthy habits in early childhood, taking into context family and community. I would also like to encourage an integrated approach to health education and physical activity for school-aged children. Placing emphasis on primary prevention offers a great opportunity to reduce morbidity and mortality from chronic illnesses and improve quality of life.

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VIRGINIA MILLER, PH.D.

Organization for the Study of Sex Differences

The Organization for the Study of Sex Differences—Recommendations for New Dimensions and Strategies in Women's Health Research

The Organization for the Study of Sex Differences (OSSD) applauds the Office of Research on Women's Health for highlighting sex disparities in cardiovascular disease as an important research agenda for the next decade. The OSSD is the Nation's only interdisciplinary scientific society whose mission is to promote the interdisciplinary science of sex/gender differences to the scientific and medical community and the public through research, education, communication, translation, and advocacy. As cardiovascular disease is the number one killer of women, and more women than men die each year from cardiovascular disease, understanding the basic biology of the impact of sex/gender in the development, diagnosis, and treatment of cardiovascular disease is a paramount requirement for improving the health of women.

Key areas that remain to be addressed include the following:

- Increased understanding of the cellular and molecular basis of sex differences in the natural history of development and treatment for cardiovascular disease
- Clearer definition of the impact of the hormonal milieu (natural transitions to puberty, long-term consequences of oral hormonal contraceptives, pregnancy, and menopausal hormonal treatments) on risk and progression of cardiovascular disease in women
- An integrated approach to understanding how neurological/psychological factors impact development of cardiovascular disease in women

To address these questions, a vital cadre of basic and clinical investigators interested in unraveling the biology of sex differences and funding to support their research are required. Design of basic science studies needs attention to sex and reproductive history of the animals and tissue used in basic science experiments. Furthermore, clinical healthcare data should be reported by sex so that databases can be used to better screen and treat women at risk for cardiovascular disease. The OSSD appreciates the opportunity to provide our recommendations to develop new strategies for women's health research. Scientists and investigators of OSSD are eager to partner with the Office of Research on Women's Heath to improve the cardiovascular health of women.

E. CLINTON LAWRENCE, M.D.

Pulmonary Hypertension Association

Recommendations to the Office of Research on Women's Health on Pulmonary Hypertension

Thank you for the opportunity to provide the perspective of the Pulmonary Hypertension Association on one important area of investment for the Office of Research on Women's Health.

I am honored to represent today the many thousands of Americans who are fighting a courageous battle against a devastating disease. Pulmonary hypertension (PH) is a fatal condition in which blood pressure in the lungs rises to dangerously high levels. In PH patients, the walls of the arteries that take blood from the right side of the heart to the lungs thicken and constrict. As a result, the right side of the heart has to pump harder to move blood into the lungs, causing it to enlarge and ultimately fail. I have been treating patients with PH since the early 1980s, when the only treatment available was heart–lung and later lung transplantation. I have been fortunate to witness over the past quarter century the development of several effective medical treatments for PH such that transplantation is needed far less frequently. Although much has been accomplished, much more needs to be done to cure this disease.

PH can occur without a known cause or be secondary to other conditions, such as congenital heart disease (atrial and ventricular septal defects), collagen vascular diseases (i.e., scleroderma and lupus), liver disease, human immunodeficiency virus, sickle cell, or blood clots. Patients develop symptoms that include shortness of breath, fatigue, chest pain, dizziness, and fainting. Unfortunately, these symptoms in young patients are often thought to be panic attacks, and patients are frequently misdiagnosed unknowingly. Patients do not present to our specialty centers until late in the disease. By the time many patients receive the correct diagnosis, the disease has progressed to a late stage, requiring continued infusion therapy, and if the patient is a candidate, a lung transplant.

PH occurs in individuals of all ages, races, and genders. However, women are more than twice as likely as men to develop PH. Women most often develop PH during their childbearing years. Pregnancy is contraindicated for PH patients because it is associated with life-threatening risks for both the mother and baby, with maternal mortality of 50 percent in the peri-partum period. Unfortunately, PH is sometimes first diagnosed late in pregnancy with devastating consequences. A vivid illustration of the latter scenario is my patient, Tavia Underwood, who 7 years ago, at age 30, was found be in decompensated heart failure from PH at 32 weeks of pregnancy. Her life and that of her son, Bo, was saved by intravenous Flolan. I understand that Bo recently attended his first Georgia Bulldog football game, with healthy-appearing Mom and proud Dad in tow.

PH is chronic and incurable with a poor survival rate. Fortunately, new treatments are providing a significantly improved quality of life for patients. Recent data indicate that the length of survival is continuing to improve, especially in a small subset of patients who are responsive to calcium channel blockers or who are treated with continuous infusions. If patients are referred early, they have often managed the disorder for more than 10 years.

Nineteen years ago, when three patients who were searching to end their own isolation founded the Pulmonary Hypertension Association, there were less than 200 diagnosed cases of the disease in the entire United States. It was virtually unknown among the general population and not well known to the medical community. The three patients' desire to change this bleak picture led to their establishment of the Pulmonary Hypertension Association (PHA), headquartered in Silver Spring, Maryland.

PHA at a Glance

- More than 10,000 patients, family members, and medical professionals as members and an additional 36,000 supporters and friends
- A network of more than 200 patient support groups
- An active and growing patient-to-patient telephone helpline
- Three research programs that, through partnerships with the National Heart, Lung, and Blood Institute (NHLBI); and the American Thoracic Society, have directed nearly more than $9 million toward PH research
- Numerous electronic and print publications, including the first medical journal devoted to pulmonary hypertension—published quarterly and distributed to all cardiologists, pulmonologists, and rheumatologists in the United States
- A Web site dedicated to providing educational and support resources to patients, medical professionals, and the public that, over the past decade, has grown from receiving 600 visits a month to now between 270,000 and 390,000 visits per month

The Pulmonary Hypertension Community

I would like to share with you the stories of two remarkable PH patients, Emily Stibbs and Charity Tillemann-Dick. Emily's and Charity's stories illustrate the impact of pulmonary hypertension not only on PH patients, but also on their family and friends.

When their daughter, Emily, was five, Jack and Marcia Stibbs noticed that she could not keep up with the other children in the neighborhood. She seemed to lack the energy and strength to run and play. This condition worsened to the point where she would have to stop and rest after coming down the steps in the morning. Jack and Marcia noticed that when she was sitting on the bottom step in the morning, Emily's lips appeared to have a bluish color.

After pressing for an answer to these problems for several months, Emily was finally diagnosed with pulmonary hypertension, and the doctors told the Stibbs family that her probable remaining lifespan was 3 years.

Charity Tillemann-Dick's diagnosis with pulmonary hypertension took not months, but years. When Charity was in her late teens, she had the opportunity to travel abroad and share her considerable talents as a budding opera singer at her grandfather's 75th birthday party in Budapest. Just before the performance, Charity collapsed, but the episode was explained away as a case of nerves.

Over the next few years, Charity continued to have occasional fainting spells as well as a progressive loss in energy. She was diagnosed as being everything from deconditioned to anemic. When Charity finally received an accurate diagnosis, she had severe PH, limiting therapeutic choices and response. Recently, Charity received a lung transplant and is continuing the long and difficult recovery process. I am happy to report that Emily has outlived her 3-year

prognosis by 9 years and continues to thrive. There is still, however, no cure for PH. Courageous patients of every age lose their battle with PH each week.

Thanks to congressional action, and to advances in medical research largely supported by the National Heart, Lung, and Blood Institute (NHLBI) and other government agencies, Emily and Charity have an increased chance of living with their PH for many more years. These advances are also impacting the prognosis for future generations of PH patients. Among the more significant findings is that of a genetic mutation responsible for the disease in the familial form of PH, and present in approximately one-quarter of patients with no family history. Findings such as these may lead to novel treatments with gene therapy, perhaps using stem cells derived from individual patients' own blood. As is often the case, such targeted research has far broader applications in other diseases and human health in general. However, additional support is needed for research and related activities to continue to develop treatments that will extend the life expectancy of PH patients beyond the National Institutes of Health (NIH) estimate of 2.8 years for 50 percent after diagnosis and to raise awareness of this rare, deadly condition.

Recommendations

In December 2006, the NHLBI and the NIH Office of Rare Diseases cosponsored a 2-day scientific conference on pulmonary hypertension. This important event provided an opportunity for leading PH researchers from the United States and abroad to discuss the state of the science in pulmonary hypertension and future research directions. The conference helped physicians collaborate and expand their knowledge and was extremely well received. Another conference would be beneficial as the field is on the verge of significant breakthroughs in our understanding of PH and the development of new and advanced treatments.

Twelve years ago, a diagnosis of PH was a death sentence, with only one Food and Drug Administration (FDA)–approved treatment for the disease. Thanks to advancements made through the public and private sector, patients today are living longer with an improved quality of life, and with a choice of eight FDA-approved therapies.

At a congressional hearing on pulmonary hypertension in December 2005, Dr. Mark Gladwin, who was then Chief of the Vascular Medicine Branch at NIH's National, Heart, Lung, and Blood Institute, said, "I study what is happening in pulmonary hypertension as an example of what you can do with an orphan disease. With the combination of advocacy, industry involvement, and state-of-the-art basic science, they came together, in a perfect storm of opportunity."

Recognizing that we have made tremendous progress, we are also mindful that we are a long way from where we want to be in 1) the management of PH as a treatable chronic disease, and 2) a cure. Our needs are in both clinical research and public and medical professional education. PH patients typically visit three physicians before a fourth makes an accurate diagnosis—often losing a year or more and making their prognosis significantly less promising.

With this in mind, the Pulmonary Hypertension Association respectfully requests that the Office of Research on Women's Health make pulmonary hypertension a research priority now and in the future.

MARY BLADES

Scleroderma Foundation

Scleroderma

Hello, my name is Mary Blades, and I have scleroderma. Scleroderma, although a big word to pronounce, is not unlike the ravage it can have on a person's body. Sclero, meaning hard, and derma, meaning skin, is the interpretation of the word, but to those of us who have it, it is much, much more. It cannot only affect the skin, which in itself is frightening, but it can also affect internal organs, which can then be life-threatening. Scleroderma is a chronic connective tissue disease generally classified as one of the autoimmune rheumatic diseases. Simply put, what is happening with scleroderma is that a protein called collagen that, under normal circumstances, heals a wound nicely, but for whatever reason with scleroderma patients, goes berserk and starts to reproduce and does not stop. There are an estimated 300,000 people in the United States who have scleroderma; 80 percent of those are women, usually diagnosed between the ages of 25 and 55.

My personal story includes going from doctor to doctor, not knowing what was wrong with me until I went to the Mayo Clinic in Rochester, Minnesota, where I got a probable diagnosis. Scleroderma manifested itself 2 weeks after I got home. It was scary; I could feel my body changing from second to second. I would look in the mirror and my wrinkles would begin to diminish; my face began looking like a doll's face; and the skin on my hands, arms, and legs was looking younger and was getting very, very hard. I couldn't help but wonder what was happening to my internal organs, as I could feel my lungs becoming heavier with every breath. Thank goodness for the meds that slowed the collagen from producing quite so fast and relieved me of some of the hardness that had been occurring so quickly. In time, a combination of meds did indeed soften my skin everywhere but my fingers, and my labored breathing eased up.

What followed were several years of doctors monitoring my meds as to how they were affecting my kidneys or anything else they might be doing to my body. But at least I had something that was helping—only to have to go off them because my body rejected them. As you probably know, your body will only tolerate certain medicines for just a few years until you have to go looking for something else that will relieve symptoms because there just is no cure, yet!

Gastro esophageal reflux disease has been in my life since the inception of my scleroderma. I have been on one form or another of reflux medication for as long as I've had scleroderma. One of my doctors told me that she was taught in medical school that reflux should be treated aggressively due to the potential hazard of esophageal cancer. Okay—another big, huge worry for a scleroderma patient.

My fingers continue to turn from red to blue to white, which in turn, creates some terribly painful ulcers. This phenomenon is called Reynaud's disease, which happens in most scleroderma patients. Doctors tell us they have not seen a patient with scleroderma who did not have Reynaud's disease. Those who have severe cases of Reynaud's lose digits and suffer extreme pain that never goes away. Early on in my disease, I was trying to braid my granddaughter's hair

and could not figure out why something I had always done with such ease was now causing me such grief. My fingers suffer from Raynaud's, but they were and are constantly swollen, and the skin is hard. They also undergo a constant battle with ulcers. Thus, I can no longer braid her hair as I used to. This sounds trivial, but it is very disheartening for me.

Fatigue is a big problem for scleroderma patients. It is a struggle to make myself do things that before scleroderma was a snap. I had a dozen things done by noon of each day and now am lucky to get a shower and a bed made. This is a real bummer because I feel I am a different person and one who is not as productive as I used to be. I am and always have been all about being productive.

Although I do not struggle with depression, I know many scleroderma patients who does. Right now, I have a friend who has not answered her phone or looked at her e-mail because she just can't bring herself to do so. Her husband shared this with us. She believes she is just fatigued, but we (Scleroderma Support Group) and her husband believe it is depression. We will continue to try to engage her, but it is very difficult.

Pain is a big concern to many with scleroderma, as it has been with me. As we know, all people are different and some tolerate it better than others. Another friend of mine was in so much pain, she wondered why she continued to hang in there; she felt it was hopeless. Fortunately, we have been able to get her to a doctor who has found some medicines that has relieved some of the pain, and she is no longer in the extreme pain and dark side she was in. Others are just downright not so lucky.

I work closely with the National Scleroderma Foundation, a nonprofit organization founded in 1998 whose mission is to provide support, education, and research. It exists for people with scleroderma, their friends, and families. We work hand in hand to give people the support they need through mutual support programs, peer counseling, physician referrals, and educational information. Education promotes public awareness and education through patient and health professional seminars, literature, and publicity campaigns. Research stimulates and supports improved treatment, which will ultimately lead to the cause of and cure for scleroderma and related diseases. The camaraderie from the Foundation and the people I have met has been therapy for myself; the support has been healing, and the caring has been a treatment. An added bonus is that they seek research dollars—research dollars to improve treatment and to find a cure.

Finding a cure is important to me, not only for myself, but also for all those suffering with this cruel disease.

When I first became involved to see what I could do to help others who were not as fortunate as myself and to be sure that research continues toward a cure, I was amazed at how little was known about scleroderma. Now things have changed somewhat, and more is known about it, but we still have a long way to go.

Because this is mostly a women's disease, as mentioned above, 80 percent of those diagnosed are women. The need to prioritize research on diseases that disproportionately affect women that have no approved therapies, like scleroderma, is imperative for those of us who suffer day in and day out.

Thank you for this opportunity to speak regarding scleroderma and its characteristic of affecting mostly women.

VIVIANA SIMON, PH.D.

Society for Women's Health Research
The Isis Fund Cardiovascular Network Testimony

The Isis Fund Cardiovascular Network, an international group of basic and clinical scientists, a program of the Society for Women's Health Research to promote innovation in women's cardiovascular health, welcomes the opportunity to contribute to recommendations that will form the basis for the women's health research agenda in the next decade. In the era of individualized medicine, epigenetics, fetal programming, cell-based therapies, and outcomes research, the time is right to take a renewed and in-depth analysis of sex and hormones in basic and clinical investigations of cardiovascular disease (CVD) in women. Emerging questions that need to be addressed include the following:

1. To what extent should sex and gender influence CVD prevention and management programs—including risk prediction, preclinical screening/detection, diagnostic testing, prognostic risk assessment, and angina and CVD management strategies—across multiple age groups?
2. Why do women tend to develop relatively less obstructive coronary disease than men, greater coronary microvascular dysfunction, and diastolic heart failure? What are the risk factors, best methods for diagnosis, and the evidence-based management strategies for these conditions in women?
3. Women have a relatively greater burden from angina and associated symptoms with and without obstructive coronary disease, with a lower quality of life and comorbidity compared to men. What are the causal mechanisms of this sex and gender difference; what evidence is needed to develop sex- and gender-based angina/coronary artery disease guidelines?
4. What is the role of ovulatory function adequacy, use of contraceptive hormones during the premenopausal period, use of hormone therapy in the peri- and early postmenopausal therapy, and oral vs. transdermal preparations on CVD?
5. Are there sex differences in the efficacy of cell-based therapies (stem cells or progenitor cells)? How does the biological sex of the donor or recipient affect the success of the therapy?

6. Can the onset of CV risk factors and conditions diagnosed during pregnancy, such as metabolic syndrome, insulin resistance, and hypertension, be used for early preclinical disease prediction or to enhance risk factor scores (Framingham, Reynolds, others) to identify elevated risk for the purposes of sex-specific CVD prevention in women?

To answer these questions will require interdisciplinary investigative teams and approaches. Nontraditional mechanisms will be needed to train such individuals and to promote and retain their expertise in challenging fiscal environments. Attention to sex, hormonal milieu, and reproductive history should be required for reporting in both basic science and clinical databases. Integrative approaches that account for physiological interactions of hormonal, neuronal, and developmental influences across the lifespan will need to be addressed. Innovative approaches to better define the biological basis of sex differences in cardiovascular disease will lead to a more rapid translation of discovery to the clinic.

The Society for Women's Health Research and the Isis Fund Cardiovascular Network welcome the opportunity to partner with the ORWH to advance and improve women's cardiovascular health into the next decade.

The Isis Fund Cardiovascular Network Members include the following:

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Psychiatry & Behavioral Neurosciences and Obstetrics & Gynecology
Women's Health Concerns Clinic

JAY KAPLAN, PH.D.

Wake Forest University School of Medicine

The Use and Promise of Nonhuman Primates in Women's Health Research

Background

Old World monkeys share with human beings 95 percent gene sequence identity; nearly identical reproductive physiology and endocrinology; and the full spectrum of chronic diseases affecting women across the lifespan, including diabetes and obesity,[1] polycystic ovarian syndrome associated with infertility,[2] hypothalamic anovulation associated with bone loss and precocious acceleration of atherosclerosis,[3] the perimenopausal transition,[4] cardiovascular disease,[5] breast cancer,[6] endometrial cancer,[7] papillomavirus-induced cervical cancer,[8] postmenopausal osteoporosis,[9] and age-related cognitive decline.[10] Furthermore, the recent sequencing of the genomes of several Old World monkeys species and the development of primate-specific research tools such as gene expression arrays have resulted in extraordinary opportunities for new discoveries in women's health in ways that are not possible in human trials due to logistical or ethical constraints, or in rodent studies owing to dissimilarities in reproductive and disease characteristics.

Three Specific Examples of Contributions to Women's Health at Midlife and Beyond

1. Studies published in 1996 with cynomolgus monkeys (*Macaca fascicularis*) predicted that conjugated equine estrogens alone would not likely increase breast cancer risk but that the addition of a progestin would markedly exacerbate such risk.[11]

2. Studies conducted on cynomolgus monkeys and published in 2002 predicted the cardiovascular outcomes of the Women's Health Initiative prior to termination of the conjugated equine estrogens/medroxyprogesterone acetate arm of that trial ("Estrogens have beneficial effects in the early stages of atherogenesis, but have little or no beneficial effects in the final stages of plaque complications, instability, or coronary heart disease events").[12]

3. Additional studies conducted on cynomolgus monkeys demonstrate that disrupted ovarian function, which occurs in all women as they transition to menopause and in

some women on repeated occasions during their reproductive years, accelerates bone loss and the development of atherosclerosis and provides a potential vulnerable period during which exogenous hormones might be used beneficially.[3] In other words, monkeys have contributed substantially to the current window of opportunity hypothesis for hormone therapy that is now being tested in two clinical trials (the Kronos Early Estrogen Prevention Study, KEEPS; the Early verses Late Intervention Trial with Estradiol, ELITE).

Major Research Opportunities Using Monkeys

1. Controlled trials of preventive and therapeutic interventions, including hormones
2. Measurement of tissue-specific gene expression to illuminate expected and unanticipated mechanisms of action for hormonally active drugs, dietary supplements, and other agents to which women are exposed
3. Identification of gene–environment interactions that result over time in differential vulnerability to risk for chronic disease

Limitations to Studies Using Monkeys

1. There is a lack of populations of monkeys at midlife and beyond that are consuming diets similar to those eaten by most women living in industrialized countries and that are dedicated to studies of women's health. Such populations are critical for both interventional studies and investigations focused on understanding individual differences in trajectories of disease risk.
2. There is a lack of funding opportunities (grant mechanisms) to support the integrated, multisystem studies that are necessary to understand the genetic and environmental factors underlying development of the major chronic and degenerative diseases impairing the lives of postmenopausal women.

Recommendations

1. Because primate studies are most efficiently done in multisystem investigations, the Office of Research on Women's Health should partner with appropriate Institutes and Centers (ICs) to develop a Request for Applications for Specialized Centers of Research in Women's Health Research that focuses on the development and use of nonhuman primate models in cross-disciplinary investigations.
2. To provide opportunities for the wide range of investigators needed for women's health research, the ORWH should partner with the ICs and the National Center for Research Resources (NCRR) to develop a program of partnership grants in women's health designed to encourage the use of nonhuman primates in collaboration with the National Primate Research Centers and colonies maintained through the Animal and Biological Materials Resources program.

3. The ORWH should partner with the NCRR to support female monkeys that have reached midlife and beyond and ensure that sufficient numbers are available for use in both interventional and observational (lifespan) studies. Nor should such primate resources be limited to a single species such as the rhesus monkey (*M. mulatta*), as there is abundant evidence that cynomolgus macaques, African green monkeys (*Chlorocebus aethiops*), and other Old World species are equally useful in modeling diseases of relevance to women.

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LISA M. TATE

WomenHeart: The National Coalition for Women With Heart Disease

Correcting Disparities in Women's Treatment and Outcome for Cardiovascular Disease

WomenHeart: The National Coalition for Women With Heart Disease commends the Office of Research on Women's Health (ORWH) for convening this meeting on research in women and cardiovascular health and disease. We applaud ORWH for highlighting cardiovascular disease, the number one killer of women, and committing to use the ideas and recommendations from this meeting to inform the National Institutes of Health (NIH) women's health research agenda for the next decade.

As the Nation's only patient-centered advocacy organization serving the 42 million American women living with or at risk for heart disease, WomenHeart: The National Coalition for Women With Heart Disease is solely devoted to advancing women's heart health through advocacy, community education, and patient support. WomenHeart is a coalition and a community of nearly 30,000 members nationwide, including women heart patients and their families, physicians, and health advocates, all committed to helping women live longer, healthier lives.

In 2006, WomenHeart joined forces with the Society for Women's Health Research (SWHR) to release *The 10 Q Report,* which identified the top 10 questions that needed to be answered if women were to receive optimal cardiovascular care and treatment.[1] The 10 questions covered differences in risk, effectiveness of risk assessment and diagnostic tools, and the effectiveness of therapies for men and women. The report highlighted the need for improved understanding of heart disease in women. *The 10 Q Report* has served as a powerful guide for the NIH, Agency for Healthcare Research and Quality (AHRQ), Centers for Medicare and Medicaid Services, and other health research agencies to develop a research agenda.

WomenHeart and SWHR are currently working with experts in women's cardiovascular health to update this report to determine why disparities in women's treatment and outcomes for cardiovascular disease still exist. Preliminary findings of the *10Q* update are consistent with results of a survey and report released January 27, 2010, by the Society for Cardiovascular Angiography and Interventions (SCAI) entitled, *Gender-Based Issues in Interventional Cardiology: A Consensus Statement from the Women in Innovations (WIN) Initiative.*[2] The SCAI report highlights gender-based disparities in CVD treatment, outcomes, and research for women, which reinforce our recommendations for the ORWH research agenda.

The first step to improving the research agenda for cardiovascular disease in women is to increase the number of women participating in clinical trials. As cited in the aforementioned SCAI report, women account for only 20 to 25 percent of patients enrolled in most CVD clinical trials. In a survey of more than 300 members of WomenHeart, all heart disease survivors, 80 percent of women who had CVD never considered participating in clinical trials because they were not aware clinical trials were recruiting patients (50 percent); they were concerned about the effects of treatment or lack of effects if given placebo (31 percent); or there were logistical issues such as transportation issues, geographic barriers, financial barriers, or lack of time (20 percent). In addition, only 10 percent of women said their physician spoke with them about participating in a clinical trial when they were first diagnosed with heart disease or a heart attack.[2] Thus, "the majority of data from clinical trials is based on a population of mostly male participants, and as a result, women are being treated according to data based on men," said Roxana Mehran, M.D., FSCAI, Director of Outcomes Research at the Center of Interventional Vascular Therapies at Columbia University, NY, and report coauthor.[2]

Increasing the participation of women in clinical trials is a priority if we are to improve diagnosis and treatment outcomes. There are many reasons more female patients are not included in research studies, but none that can't be addressed. We concur with the recommendations in the SCAI report that future clinical research includes a predefined number of women in all trials, so that future studies are adequately powered to address the applicability of the results to the female population.[2] WomenHeart is eager to partner with the translational research community to increase participation of women in clinical trials, which should result in a decrease in gender disparities. We recommend the following action steps:

- Ensure that physicians and hospitals provide information to women about clinical trials
- Target women's heart centers for trial recruitment
- Ensure that when a pharmaceutical or device reaches panel, gender use and applicability are examined
- Consider incentives for trials with appropriate gender representation
- Consider mandating that clinical trials have appropriate gender representation whenever possible
- Consider requiring trial sponsors to set protocols/trial designs that report results by gender
- Enforce requirements that federally reported healthcare data be stratified by gender, race, and ethnicity

Identifying the areas where these troubling disparities exist and solving the scientific questions that underlie the basis for gender disparities are the next steps. The most urgent question to be answered is why more women die from heart disease than men. A research agenda that addresses gender-based disparities must investigate myriad issues, but the following are the most pressing, in our view:

- Sex differences in the development, natural history, responses to treatment, and clinical outcomes with heart disease

- Role of a woman's reproductive history and menopausal hormone therapy in the development of heart disease
- Risk factors for the cardiovascular disorders associated with pregnancy
- Impact on heart disease of psychosocial issues such as depression and anxiety in women

Designing research studies to determine the impact of sex differences on the natural development of heart disease and subsequent diagnosis and treatment is critical to eliminating disparities. Determining the unique effect that reproduction and menopausal hormone therapy have on a woman's risk of heart disease should improve the care of women throughout their lifespan. Finally, becoming more familiar with the effect of psychosocial aspects of heart disease in women will make primary and secondary prevention and treatment more effective.

The SCAI report also states that among women and healthcare providers, there is a lack of recognition of heart problems and subsequent treatment, which results in women not receiving early medical intervention.[2] This delay in recognition of heart irregularities by healthcare providers and women themselves indicates the need for additional action:

- Educate all healthcare providers to know the signs and symptoms of a heart attack, including atypical symptoms specific to women
- Educate women to know the signs and symptoms of a heart attack, including atypical symptoms specific to women
- Evaluate healthcare provider adherence with guidelines for care, including use of percutaneous coronary intervention, ACE inhibitors, lipid-lowering therapy, and even aspirin
- Improve and expand screening for low-income women at risk for heart disease and stroke

Our national network of incredible, courageous patient volunteers, our WomenHeart Champions, in conjunction with the only national network of patient-led support groups for women with heart disease, stand ready to assist you in the fight against heart disease.

We appreciate this opportunity to provide our recommendations and look forward to working with you.

References

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TESTIMONY PROVIDERS BY NAME

TESTIMONY PROVIDERS BY ORGANIZATION

SUBJECT INDEX

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