

MEETING SUMMARY
PRESIDENT'S CANCEL PANEL
PROMOTING HEALTHY LIFESTYLES
TO REDUCE THE RISK OF CANCER

December 5, 2006
Portland, OR

OVERVIEW

The President's Cancer Panel (PCP, the Panel) is seeking input to help develop its recommendations to the President of the United States, the U.S. Congress, the Secretary of Health and Human Services (HHS), and the broader community of researchers, policy makers, advocates, and others within the cancer community.

This meeting was the third in the 2006-2007 series focusing on ways to reduce the risk of cancer incidence and mortality through the promotion of healthy lifestyles. In two of the meetings in this series, the Panel will hear reports on factors linking obesity, physical activity, and nutrition to cancer risk. The other two meetings will focus on the factors linking tobacco use and environmental tobacco smoke to cancer risk.

PARTICIPANTS

President's Cancer Panel (PCP)

LaSalle D. Leffall, Jr., M.D., F.A.C.S., Chair
Margaret Kripke, Ph.D.

National Cancer Institute (NCI), National Institutes of Health (NIH)

Abby Sandler, Ph.D., Executive Secretary, PCP, NCI

NCI Director's Consumer Liaison Group (DCLG)

Sue Sumpter, Leukemia and Lymphoma Society

Speakers

Grover C. Bagby, M.D., Director, Cancer Institute, Oregon Health and Science University (OHSU)

Eugenia E. Calle, Ph.D., Director of Analytic Epidemiology, American Cancer Society (ACS)

Karen Glanz, Ph.D., M.P.H., Director, Emory Prevention Research Center, Rollins School of Public Health, Emory University

Peter Greenwald, M.D., Dr.P.H., Director, Division of Cancer Prevention, NCI

David Heber, M.D., Ph.D., Director, UCLA Center for Human Nutrition, University of California, Los Angeles

Danielle Killpack, Senior Manager, Corporate Responsibility, Nike, Inc.

Lawrence H. Kushi, Sc.D., Associate Director for Etiology and Prevention Research, Kaiser Permanente

Jonathan Lever, Ed.M., J.D., Director, YMCA Activate America, YMCA of the USA

Anne McTiernan, M.D., Ph.D., Director, Prevention Center, Fred Hutchinson Cancer Research Center

Dwayne C. Proctor, Ph.D., M.A., Senior Program Officer, Health Group, Robert Wood Johnson Foundation

LaDonna Redmond, President and CEO, Institute for Community Resource Development

Kenneth Reed, Ed.D., Director, P.E.4Life Center for the Advancement of Physical Education

Kerri Winters-Stone, Ph.D., Assistant Professor and Associate Scientist, School of Nursing, OHSU

OPENING REMARKS—DR. LaSALLE D. LEFFALL, JR.

On behalf of the Panel, Dr. Leffall welcomed invited participants and the public. He provided a brief overview of the history and purpose of the Panel and the aims of the current series of meetings on reducing the risk of cancer incidence and mortality through the promotion of healthy lifestyles. Dr. Leffall explained that the issues being explored today would relate to the impact of obesity, physical activity, and nutrition on cancer risk. He added that the meeting would consist of three panel discussions—two addressing current knowledge and one on community-based programs. Dr. Leffall thanked Dr. Grover C. Bagby and the Oregon Health and Science University Cancer Institute for hosting this meeting.

WELCOME—DR. GROVER C. BAGBY

Background

Since graduating from medical school in 1968, Dr. Bagby has devoted his research efforts to finding cures for the incurable. His leukemia research involves the family of Fanconi anemia genes. His laboratory is examining the proteins these genes make, both mutated and normal, to figure out the differences that can lead to leukemia later on. Recently, the Leukemia and Lymphoma Society honored Dr. Bagby and the Cancer Institute he founded for demonstrating a steadfast commitment to finding cures for blood cancers and improving the lives of patients and their families. One of the projects he is most proud of as director of the Cancer Institute is the Continuing Umbrella of Research Experience (CURE project), where high school juniors and seniors team up with mentors to conduct research projects.

Key Points

- < Dr. Bagby welcomed participants on behalf of the Oregon Health and Science University.
- < The OHSU Cancer Institute is best known for the realization that if you understand something on a molecular level, you can fix it. The work of Dr. Brian Druker at OHSU led to the development of Gleevec for the treatment of not only chronic myelogenous leukemia, but also about five other disorders. Other studies at the Institute have taken molecular approaches to diagnosis and cancer prevention.
- < OHSU has a Center for Weight Regulation. Its research topics include the genetic and physiological aspects of childhood obesity and the role of maternal nutrition on the development of obesity in offspring.
- < The OHSU Cancer Institute has teams that are developing a molecular basis for nutritional control of cancer and has established one of the nation's first groups of clinical and translational research institutions.
- < Portland is also the site of one of the largest Komen-supported Races for the Cure. It is also the corporate home of Nike.

PANEL I

DR. EUGENIA E. CALLE: Obesity and Cancer—An Overview

Background

Dr. Calle received her Ph.D. in epidemiology from The Ohio State University in 1982. She worked as an epidemiologist at the Oak Ridge National Laboratory in the area of cancer risk assessment from 1979 to 1984 and at the Centers for Disease Control on the Agent Orange Projects from 1984 to 1989 prior to joining the American Cancer Society in 1989. She is

currently the Managing Director of Analytic Epidemiology, a position she has held since 1994. In this capacity, she oversees all program activities, including data collection, management, and analyses, for the Cancer Prevention Study cohorts. Her research has been primarily in the areas of breast cancer risk factors, hormone-replacement therapy and cancers in women and, more recently, adiposity and cancer incidence and mortality. Her scientific publications include analyses of body mass index (BMI) and total mortality; analyses of BMI and mortality for the 20 most common cancer sites in men and women; in-depth evaluations of BMI and cancers of the colon, breast, ovary, prostate, lung, and pancreas; and review articles on the epidemiology of obesity and cancer. Her future work will focus on how BMI and adult weight change influence cancer survival.

Key Points

- < The increase in obesity in the United States has not been slow or gradual. Dramatic increases in obesity began in the early 1980s and have persisted over the last 25 years.
- < Studies of associations between obesity and cancer represent a relatively new field in comparison with studies of the relationships between obesity and heart disease and diabetes. Research on specific mechanisms is now ongoing with regard to numerous cancer sites.
- < In 2002, a panel convened by the International Agency for Research on Cancer concluded that several cancers are associated with obesity, including colon cancer in men and women, cancer of the breast in women who are postmenopausal, endometrial cancer, renal cell cancer, and adenocarcinoma of the esophagus.
- < Cancers for which an association with obesity is likely to be demonstrated in the near future include adenocarcinoma of the gastric cardia, gall bladder cancer, liver cancer, pancreatic cancer, advanced prostate cancer, and the hematopoietic cancers, including non-Hodgkin's lymphoma, multiple myeloma, and perhaps even leukemia.
- < The proportion of cancer cases that can be attributed to obesity ranges from approximately 20 percent, in the case of colorectal cancer in women or breast cancer in postmenopausal women, to greater than half in the case of adenocarcinoma of the esophagus or cancer of the endometrium.
- < Body weight has a strong effect on many metabolic factors, including circulating levels of both peptide and steroid hormones and their binding factors. These effects vary significantly by gender and by menopausal status in women. These are hypothesized to be systemic mechanisms linking obesity to different cancer sites.
- < Local mechanisms vary by cancer site. It is thought that gastroesophageal reflux disease creates a condition of chronic inflammation leading to Barrett's esophagus, which is a precursor lesion to adenocarcinoma of the esophagus. Gall stones are associated with gall bladder cancer and obesity is a risk factor for developing gall stones. Fatty liver disease, an inflammation of the liver that looks similar to alcoholic liver disease but occurs in overweight people who do not necessarily drink, can lead to hepatitis and then to hepatocellular carcinoma.
- < In the last 5 to 7 years, researchers have begun to think of adipose tissue as an endocrine organ rather than a static deposit of fat reserves. Adipose tissue receives signals from other organs and responds by regulating secretions of multiple proteins called adipokines, which regulate many pathways that may be important in terms of cancer occurrence and progression. Obesity is associated with substantial dysregulation of the secretions of these adipokines.
- < Weight loss reduces insulin resistance; reduces circulating levels of insulin and glucose and circulating levels of steroid hormones like estradiol; and increases levels of sex hormone-

binding globulin. Weight loss of 5 to 10 percent is sufficient to cause these changes. Given the mechanisms that have been hypothesized for the relationship between obesity and cancer, such weight loss should contribute to reducing the risk of cancer. Evidence for the influence of weight loss on insulin-like growth factors and binding proteins is less clear.

- < Due to lack of follow-up and the tendency of Americans to regain lost weight, little is known about long-term effects of these changes. However, several studies have suggested that women who lose weight late in life do experience a reduced risk of breast cancer.
- < Adiposity is associated with poorer survival and increased likelihood of recurrence among women with breast cancer. Breast cancer mortality rates are two-and-a-half to three times as high in obese women as in very lean women. There is substantial evidence to suggest that this impact does not vary by menopausal status, but data on other possible variations are not conclusive.
- < The association between adiposity and breast cancer is unlikely to be the result of delayed diagnosis among heavier women. Evidence suggests that breast cancer tumors in obese women are larger, are detected at later stages, are assigned higher histological grades, and involve more extensive nodal involvement.
- < Most women diagnosed with breast cancer gain weight, especially those treated with chemotherapy. Several small studies have suggested that this postdiagnosis gain has a detrimental impact on prognosis. Larger studies with longer follow-up that collect data on prediagnosis weight are needed.
- < Many studies have shown null or inconsistent results for obesity as a predictor of prostate cancer incidence. A few studies have shown consistent positive associations between obesity and aggressive or fatal prostate cancer. A series of recent studies suggests that men with higher BMI are at greater risk of biochemical progression as evidenced by a detectable PSA level following radical prostatectomy.
- < Part of the association between obesity and aggressive prostate cancer include variations in screening rates, the difficulty of performing rectal examinations with obese men, and a greater risk of positive surgical margins.
- < Some evidence exists indicating that obesity is associated with more aggressive prostate cancer tumors. The 1959-1972 Cancer Prevention Study I and the 1982-1996 Cancer Prevention Study II both show a strong relationship between high BMI and high prostate cancer mortality.
- < Few studies have focused on the association between obesity and prognosis for other cancers. However, a 2003 study of cancer mortality by BMI across a wide variety of cancer sites concluded that 14 percent of all cancer deaths in men and 20 percent in women can be attributed to overweight and obesity.
- < The American Cancer Society's Guidelines on Nutrition and Physical Activity for Cancer Prevention have recently been updated. Among the four guidelines, the recommendation to maintain a healthy weight throughout life was moved from the third to the first position.

DR. PETER GREENWALD: Eating Behavior and Cancer Prevention

Background

Dr. Greenwald is the Director of the Division of Cancer Prevention at the National Cancer Institute. Under his direction, research on cancer prevention, covering a broad spectrum from basic research through clinical and public health research, is combined in the pursuit of a significant reduction in cancer incidence, morbidity, and mortality. Dr. Greenwald is certified in both Internal Medicine and Preventive Medicine, and earned his Dr.P.H. at the Harvard School of

Public Health, where he focused on cancer epidemiology. Among his responsibilities is the development and conduct of cancer prevention clinical trials focusing on the areas of diet and cancer, and chemoprevention. His research work relates primarily to human cancer prevention trials, cancer epidemiology, and cancer control. Dr. Greenwald is the author of over 250 scientific papers.

Key Points

- < The linking of nutritional science and physical activity to public health guidance has been largely driven by epidemiological research. Convincing data have been produced on the effects of obesity and exercise on the development of cancer; to extend this knowledge, current programs in epidemiological and behavioral science need to be supplemented by a greater investment in nutritional science. In 1981, English epidemiologists Richard Doll and Richard Peto estimated that approximately 35 percent of cancer mortality was attributable to diet. However, this connection was not intensely studied.
- < During the 1980s and 1990s, a series of nutrition-related recommendations was issued by the U.S. Surgeon General's Office, the U.S. Department of Agriculture (USDA), and others. Most focused on reducing the amount of calories consumed from fat. The response from the food industry was the development of foods low in fat but still high in calories.
- < In 1996, the American Cancer Society compared the failure to achieve a diet that promotes health to the increasing use of tobacco among teenagers.
- < A joint 1997 publication of the World Cancer Research Fund and the American Institute for Cancer Research stressed the importance of consuming a diet based primarily on foods of plant origin.
- < The latest ACS nutrition and physical activity guidelines also stress adoption of a diet with an emphasis on plant sources.
- < The most recent USDA recommendations acknowledge that there is no "one size fits all" approach to dietary health, but fails to provide specific guidance on what foods should be eaten.
- < Consistent health messaging developed by NCI, ACS, and other key organizations would likely have an increased impact on public health.
- < Behavioral research has focused on the actions of individuals. Little is known about how to modify the behaviors of institutions and communities. The ACS has made new recommendations concerning actions that communities and institutions should take, including improved access to healthy food in schools and work sites.
- < Portion size is an important factor in nutrition. Ten years ago, the average restaurant appetizer plate was 6 inches in diameter, and a main course plate was 12 inches. Today, those averages are 9 and 14 inches, respectively. Fast-food restaurants and beverage producers have also enlarged portion sizes.
- < Several key points should be conveyed in a simple message for people at the eighth-grade reading level: eat less in smaller portions; avoid sugary soft drinks; exercise throughout life; and promote community action to provide opportunities for physical activity.
- < The need for progress in the nutritional sciences includes a need for biomedical research to help understand the health implications of advances in food science. Achievements that extend shelf life and facilitate microwave cooking, for example, are changing lifestyles, but little is known about the health benefits or hazards presented by these advances. For most of these new products, the mechanisms by which they affect nutrition are unknown.

- < Food science presents opportunities to achieve advances in cancer prevention. Researchers need to learn how foods affect the cellular microenvironment. Computational biology, molecular biology, genomics, and related fields need to work together to guide genetic engineers, who are beginning to ask questions about what new attributes should be added to foods.
- < As cancer prevention becomes an integral part of the oncology field, research institutions and medical schools will need to better understand nutrition. NCI can stimulate this understanding by providing cancer centers and other research institutions with support for at least one strong leader at each institution. A mechanism like the program project grant, funded through RFAs or set-asides, can provide the leverage to bring investigators together on collaborative studies. In the current fiscal environment, however, it will be difficult to justify the dedicated effort that will be required to build up basic nutritional science.

DR. DWAYNE C. PROCTOR: Obesity and Cancer

Background

Since April 2005, Dr. Proctor has served as Team Leader for the Robert Wood Johnson Foundation's (RWJF) Childhood Obesity Team, which seeks to reverse the increase in the prevalence of childhood obesity by promoting healthy eating and physical activity in schools and communities throughout the nation. The team places special emphasis on reaching the children at greatest risk: African American, Hispanic, Native American, and Asian/Pacific Islander children living in low-income communities. Dr. Proctor joined RWJF in January 2002 as a Senior Communications and Program Officer, with specific assignments on a variety of child health and risk prevention initiatives (e.g., Nurse Family Partnership, Free to Grow, Leadership to Keep Children Alcohol-Free, Campaign to Prevent Teenage Pregnancy). He previously served as an assistant professor at the University of Connecticut School of Medicine, where he implemented interventions designed to decrease interpersonal violence among at-risk youth. As a Fulbright Fellow in Senegal, West Africa, he investigated the effectiveness of HIV/AIDS risk messages in raising awareness of AIDS as a national health problem. He received his bachelor's, master's, and doctoral degrees in communication science from the University of Connecticut.

Key Points

- < The link between obesity and cancer is well documented. Obese Americans are more likely to be diagnosed with cancer and face higher mortality and recurrence rates.
- < A team of 17 public health professionals at the Robert Wood Johnson Foundation is working to reverse the epidemic of childhood obesity in the United States.
- < Over the past four decades, the obesity rate among children between the ages of 2 and 5 has almost tripled; among those between the ages of 6 to 11, the rate has more than quadrupled.
- < Overweight children become obese teenagers through a phenomenon that has been called a "long-term energy gap" by Dr. Claire Wang and her colleagues at the Harvard School of Public Health in a study supported by RWJF. The average obese teenager has been consuming up to 1,000 calories more than was burned every day for approximately 10 years. Even among nonobese teenagers, the energy gap is between 110 and 165 calories per day.
- < Teenagers could eliminate the energy gap by, for example, consuming water instead of sugared soft drinks and fruit instead of french fries. They could also address this gap by participating in physical education (PE) and riding bicycles after school instead of watching television. To support these goals, schools must provide PE facilities and classes (less than 10 percent of today's school children have such opportunities), and communities must provide a safe environment for outdoor activities.

- < Over the past 20 years, spending at fast-food restaurants has increased 18-fold, and the typical calorie content of fast-food menu items has increased by approximately 50 percent.
- < Families hardest hit by poverty often face barriers to making healthy choices. The grocery stores in their communities typically do not stock affordable and appealing fresh fruits and vegetables. Their communities usually lack safe playgrounds and organized physical activity programs.
- < RWJF believes that obesity can be prevented if these barriers are removed. The Foundation's grant program focuses on those at greatest risk—children ages 3 to 18 living in low-income communities where obesity rates are the highest. The goal is to help children make lifelong behavioral changes that can be passed down through generations.
- < The program has three major objectives: building evidence to support policy and environmental changes, testing and evaluating approaches to taking action in communities to spread the use of promising models, and educating leaders through advocacy.
- < An example of evidence building is an evaluation of efforts to implement Arkansas Act 1220, a 2003 state law that mandated a comprehensive approach to addressing childhood obesity in public schools, including the confidential reporting of each student's BMI to his or her parents. The law also calls for changes in foods provided in schools; retraining of cafeteria workers; limited access to vending machines until 2 hours after lunch; and increased physical activity in schools. The RWJF-funded study analyzed BMI data for Arkansas school children and identified the most successful approaches to behavior change in Arkansas schools. To date, results of this study have shown significant progress in halting the progression of childhood obesity.
- < An example of a scalable intervention that can be easily replicated is the Alliance for a Healthier Generation's Healthy Schools Program. The Program, funded by the Foundation, has developed a number of policy recommendations that schools can implement to promote improved nutrition, physical activity, and overall wellness. This year, the Program was launched in 200 schools and, over the next 5 years, hopes to reach thousands of schools across the nation.
- < Lessons learned through evidence building, intervention development, and evaluation activities are being shared with political leaders and advocates. For example, the Foundation is supporting efforts of Arkansas Governor Mike Huckabee to make school, home, and workplace wellness a key initiative of his service as chairman of the National Governors Association. The Foundation also supports a variety of state childhood obesity prevention programs.
- < Business and industry are a critical part of the solution to this problem. Food marketing has a powerful effect on children's eating preferences and parents' purchasing habits. Unfortunately, the strongest commercial campaigns often tend to market the least healthy products to the most vulnerable consumers. The Foundation is exploring opportunities to sponsor discussions between industry leaders and the public health community to identify common ground and foster action towards improving food environments in low-income communities.
- < Philanthropic organizations like RWJF can play an important role in calling attention to the childhood obesity epidemic, but reversing the epidemic will require coordinated effort by the public and private sectors to address policy and environmental factors that contribute to unhealthy food consumption and lack of physical activity.
- < If all stakeholders wholeheartedly back the kind of proactive, coordinated, and sustained response that the childhood obesity epidemic warrants, the current trend toward obesity can be reversed, which will help reduce incidence not only of cancer but also of Type 2 diabetes,

heart disease, hypertension, and a host of other deadly diseases. Additionally, preventing childhood obesity can make a major contribution to eliminating health disparities in the United States.

DR. ANNE McTIERNAN: Mechanisms Linking Energy Balance with Cancer

Background

Dr. McTiernan is a faculty member in the Division of Public Health Sciences at the Fred Hutchinson Cancer Research Center in Seattle, Washington, and a Research Professor in the University of Washington Schools of Medicine and Public Health and Community Medicine. At the Fred Hutchinson Cancer Research Center, she is Director of the Prevention Center, which includes an ambulatory clinic, an exercise testing and training facility, and a human nutrition laboratory. She received her medical training at New York Medical College and her primary care internal medicine training at the University of Washington. Dr. McTiernan's research focuses on identifying ways to prevent new or recurrent breast cancer and colorectal cancer, especially related to physical activity, obesity, and chemoprevention. She is Principal Investigator of several clinical trial and cohort studies investigating the associations among exercise, diet, body weight, hormones, chemoprevention agents, and risk for cancer incidence and prognosis. She is Principal Investigator of one of four NCI-funded Transdisciplinary Research on Energetics and Cancer (TREC) Centers of Excellence focused on mechanisms linking obesity and a sedentary lifestyle with cancer and on obesity prevention. Dr. McTiernan is also a Co-Investigator with the Women's Health Initiative Clinical Coordinating Center.

Key Points

- < The study of mechanisms linking energy balance with cancer is necessary to confirm associations between cancer and weight control and physical activity; provide evidence related to cancer causation, prognosis, and prevention; and help determine specific recommendations for weight control and physical activity.
- < Increased physical activity has been associated with reduced risk for several cancers, and increased weight has been associated with increased risk for several cancers. The mechanisms involved in these associations have not been confirmed; exercise and weight loss intervention trials can be used to assess some of these effects independent of other nutrition and lifestyle factors.
- < There have been few observational studies of weight loss. However, the Nurses Health Study has examined data on weight change among women after menopause. It was found that breast cancer risk was reduced among postmenopausal women who lost weight, regardless of whether they received hormone therapy.
- < As mentioned by Dr. Calle, adipose tissue is thought of as an endocrine organ that produces estrogens and androgens in both men and women. Obese individuals often have increased levels of insulin and glucose. All of these substances are associated with increased cancer risk.
- < Women who are obese have higher levels of prolactin and higher levels of leptin and other adipokines. These substances are secreted by fat tissue. Prostaglandins can be related to physical activity levels and may be related to certain cancers. Cytokines, which are also released by fat tissue and cause inflammation, may also be related to cancer.
- < Some researchers believe that certain immune functions are related to some cancers, including breast cancer.

- < Research is needed to examine the impact of changes in body fat or physical activity at the molecular and cellular levels, such as effects on oxidative damage, DNA repair, apoptosis, and cell proliferation.
- < A collaborative study comparing thousands of women with and without breast cancer found a significant increase in risk associated with increased levels of estrogens and testosterone. In postmenopausal women, these hormones are produced in fat tissue. In another large study, increased levels of insulin in obese women were associated with increased risk of breast cancer recurrence and mortality.
- < A subsample of data from the Women's Health Initiative was used to examine the relationship between adiposity, physical activity, and blood estrogens in postmenopausal women aged 50 to 75. Estrone and estradiol levels were significantly higher among women who were the most overweight and the least active.
- < In Seattle, Dr. McTiernan and colleagues conducted a randomized clinical trial testing the effects of moderate to intense exercise on serum estrogens and other breast cancer biomarkers among postmenopausal, overweight, inactive women. Biomarkers measured included estrone, estradiol, free estradiol, estrone sulfate, urinary estrogen metabolites, testosterone, free testosterone, androstenedione, dehydroepiandrosterone, dehydroepiandrosterone sulfate, insulin, glucose, and leptin. Levels of several hormones significantly decreased among women who lost body fat. Insulin levels decreased among those who exercised, even if they did not lose weight. Exercise reduced prolactin but did not have an effect on insulin-like growth factors.
- < The Seattle TREC Center is conducting five studies on the association between energy balance and cancer. One focuses on the effect of hyperglycemia on cell growth and cell death. A second project is a set of animal studies testing various interventions for their ability to affect cancer incidence. A third study is comparing the effects on cancer biomarkers of high-glycemic and low-glycemic diets among obese and nonobese people. A fourth study is examining the effect of weight loss and physical activity, separately and in combination, among postmenopausal women. The fifth project is a population-based worksite study that is testing obesity prevention interventions among minority workers.
- < Future research needs in this area include testing the effects of different types of exercise intensity, frequency, and duration on cancer biomarkers to better understand how to prescribe physical activity; comparing the effects, in various populations, of fat loss through diet, exercise, and a combination of the two; exploring the role of genetic polymorphisms related to cancer biomarkers; and conducting a large-scale trial to test the effects of weight loss, weight maintenance, and physical activity on prevention and treatment of common cancers.
- < In conclusion, observational and clinical data suggest that moderate levels of aerobic exercise, such as walking, can reduce the risk of several cancers. Increasing exercise intensity or duration can increase this benefit.

DISCUSSION: PANEL I

Key Points

- < An individual's BMI can be calculated using measurements of weight and height; however, many medical office visits do not include a calculation or discussion of BMI. Even when weight is measured during office visits, trends in weight are not often tracked. Increased use of electronic medical records may encourage calculating BMI and monitoring weight change.

- < Children's height and weight are often measured as part of school-based activities, including sports, and could be used to calculate BMI. If this information is provided to parents, it should be accompanied by suggestions for changes in diet and physical activity.
- < Advancing knowledge about the mechanisms by which obesity (and other behavioral and environmental factors) affects cancer risk must be accompanied by research on removing barriers that hinder public compliance with health recommendations.
- < Motivating people to become more physically active involves multiple factors, including provision of safe and healthful environments.
- < Tobacco use has been reduced to the point that smoking is considered outside social norms. A similar shift is possible in attitudes toward weight, resulting in increased concern among parents and communities about childhood obesity.
- < RWJF can provide educational materials about energy balance and nutrition, and plans to develop advocacy toolkits that can be used in developing policy recommendations.
- < The dramatic increase in obesity can be largely attributed to the fact that society has become more sedentary, schools do not emphasize physical education as much as they did in the past, and the food supply has become more unhealthy. Cessation of smoking and use of some medications (such as psychotropics and antidepressants) are associated with increased body fat.
- < Little is known about the combined effects of multiple additives in foods, especially newer substances that have been developed for microwavable products.
- < Schools should be required to provide adequate resources for physical activity. Businesses should be provided with tax incentives to encourage development of healthier environments. Physicians should be required to measure and track BMI and discuss this issue with patients and parents.
- < The increased risk of obesity for cancer survivors and its association with increased risk of recurrence should be discussed in educational materials provided to patients.
- < Most aspects of modern life that are associated with sedentary behavior (e.g., reliance on automobiles, desk jobs) are not going to be reversed. Changes in food intake and physical activity levels will require behavior modification within that context.
- < Changes in the food environment within schools cannot occur without removal of the financial incentives provided by producers of fast foods and soft drinks.
- < The beneficial aspects of new technologies should be utilized. Many computer games encourage sedentary behavior, for example, but others promote physical activity. Work stations that allow workers to stand should be made available for part of each day so that workers are not required to sit all day.

PANEL II

DR. LAWRENCE H. KUSHI: Promoting Healthy Dietary Patterns to Reduce Risk of Cancer

Background

Dr. Kushi is Associate Director for Etiology and Prevention Research, Division of Research, Kaiser Permanente. His research interests have focused on the role of food and nutrition in the development and prevention of coronary artery disease and breast and other cancers; he is currently the Principal Investigator of two NIH-funded prospective cohort studies. One of these is examining the role of genetic and environmental factors in development of early puberty in a

study population of over 400 girls. The other is examining lifestyle and genetic factors in breast cancer prognosis, with the aim of enrolling several thousand participants. Dr. Kushi has held research and faculty positions at the Fred Hutchinson Cancer Research Center, the University of Washington, the University of Minnesota, and Columbia University, where he is currently an Adjunct Professor. He has served on ACS committees to develop guidelines for the dietary prevention and management of cancer and served as Chair of the Food and Nutrition Section of the American Public Health Association.

Key Points

- < The new American Cancer Society guidelines on nutrition and physical activity were developed by a committee that included representatives of the American Diabetes Association, the American Heart Association, and NCI. An effort was made to harmonize the new guidelines with the guidelines of those organizations. The food-related recommendations include eating at least five servings of fruits and vegetables per day, replacing refined grains with whole grains, and limiting intake of red meat and alcohol.
- < Societies that emphasize plant-based foods over animal-based foods have substantially lower rates of cancers common in the United States, including breast, colon, and prostate cancers. Vegetables, fruits, and whole grains contain many naturally occurring chemical compounds that are thought to have anticancer properties.
- < Epidemiologic studies have demonstrated that individuals who consume more plant-based foods and fewer animal-based foods have lower rates of specific types of cancer. Results of several case-control and cohort studies have shown an association between increased intake of fruits and vegetables and decreased risk for various cancers.
- < Whole grains contain a variety of phytonutrients that are thought to have anticancer properties. A meta-analysis of findings from a number of case-control studies showed that people who consumed whole grains had decreased risks for several cancers. A review of 68 studies that examined intake of refined grains showed an association with increased cancer risk. Data from the Nurses Health Study indicate that intake of whole grains and increased intake of dietary fiber are associated with reduced body weight over time.
- < Intake of processed and red meats is strongly associated with increased cancer risk. The Nurses Health Study found that women who ate red meat daily had two-and-a-half times the likelihood of developing colon cancer over the study's follow-up period than those who reported eating red meat less than once per month. A meta-analysis of cohort studies showed that, taken as a whole, the studies suggest an increased risk for colorectal cancer among people with high red meat consumption; an analysis of data on the intake of processed meats produced similar results.
- < Colon cancer rates vary widely across international boundaries. For example, rates are very high among African Americans and low in India and Thailand. These variations are highly correlated with meat consumption. Colon cancer rates in Japan have increased dramatically in recent years; this increase coincided with equally dramatic increases in intake of meat, dairy products, and added sugars.
- < Several cancers are clearly associated with alcohol consumption. Once thought to be associated primarily with cancers of the liver and the gastrointestinal system, alcohol has recently been associated with breast and colon cancers.
- < The ACS has also made recommendations concerning community action. The energy imbalances that result in obesity occur in a societal context that affects the availability of foods and the opportunity to engage in physical activity. Research examining the role of the built environment on obesity and cancer risk is needed. This will require application of

epidemiologic methods in studies that consider social trends, transportation and land use policies, zoning regulations, and even political philosophies that underlie decisions that influence food availability and opportunities for physical activity.

- < After receiving a diagnosis of cancer, patients often find that there are few clear answers to even the simplest of questions, such as: Should I change what I eat? Should I exercise? Should I lose weight? Should I take dietary supplements? How about herbal remedies? Survivors receive a wide range of advice from many sources but, unfortunately, this advice is often conflicting. Research is needed on lifestyle factors and cancer prognosis.
- < Large cohort studies using quantitative dietary assessment methods are needed to better understand certain discrepancies between cohort study and case-control study findings on diet and cancer. Food frequency questionnaires are the most common instruments used, but two recent studies suggest that more quantitative (and more expensive) dietary assessment methods, such as food records, may better detect diet-related cancer risks.

DR. KERRI WINTERS-STONE: Cancer Prevention and Survival—The Role of Physical Activity and Promotion of Active Lifestyles

Background

Dr. Winters-Stone is currently an Assistant Professor and Associate Scientist at OHSU. She has been studying bone health in men and women for more than 11 years and over the past 4 years has integrated this expertise into the field of cancer survivorship. Her academic career has focused on improving bone health through lifestyle modifications across the lifespan, particularly through targeted exercise programs. Her most recent research focuses on the effects of cancer treatment on fracture risk and the ability of exercise to improve health in cancer survivors. Her research has received funding from NASA, Life Fitness, Inc., the American College of Sports Medicine, the OHSU Clinical Research Enhancement and Medical Research Foundation, the National Institute of Nursing Research, the Lance Armstrong Foundation, the American Cancer Society, and the Susan G. Komen Foundation. Currently, she is leading three randomized controlled exercise trials aimed at optimizing body composition and physical function in breast and prostate cancer survivors.

Key Points

- < Knowledge of the health benefits of physical activity has grown tremendously in the past decade. The U.S. Surgeon General's 1996 report on physical activity and health indicated that Americans can substantially improve their quality and quantity of life by engaging in moderate amounts of physical activity. Evidence for this report came largely from a solid body of data showing that moderate amounts of physical activity could reduce risk and death from heart disease. Since then, research has expanded to examine the protective benefits of physical activity for chronic illnesses other than heart disease.
- < Growing evidence from both prospective cohort and case-control studies suggests a link between physical activity and a reduced risk for some, but not all, cancers. The evidence is strongest for breast and colon cancer. Women who report exercising regularly at a level consistent with national guidelines have a 30 to 40 percent lower risk of developing breast cancer compared with sedentary women. Similar evidence exists for colon cancer, where a 20 to 30 percent reduction in risk is experienced by physically active men and women. There appears to be a dose-response relationship between physical activity and cancer risk, where greater levels of physical activity confer greater benefit.
- < There is preliminary evidence for an association between moderate to vigorous physical activity and a reduced risk of lung cancer, a reduced risk of aggressive prostate cancer and

death from prostate cancer (but not on overall prostate cancer risk), and a modest effect on risk of endometrial cancer.

- < Physical activity has the potential to improve the health of cancer survivors, and this has very important societal and economic implications. Studies of physical activity interventions have been conducted in several cancer patient populations, both during and after treatment, but the science is still relatively young. Research on cancer survivorship is growing and improving in scientific rigor, but many important questions remain. Based on a limited number of studies conducted thus far, there is evidence for a small to moderate effect of physical activity on cardiorespiratory fitness, symptoms, vigor, and immune function.
- < Since epidemiologic studies cannot establish cause and effect, there is need for large, multicenter randomized controlled trials to confirm the ability of physical activity to reduce cancer risk. Randomized trials of physical activity in both the general public and cancer survivors should also include markers of cancer initiation and progression, such as sex hormones and growth factors. These biomarkers can address the underlying biologic mechanisms for risk reduction and can also be used as surrogate markers of risk if data on cancer incidence are not available.
- < Epidemiologic studies need to collect more detailed information on physical activity and consistently apply that information to support development of an optimal exercise prescription to protect against multiple cancers.
- < There is insufficient evidence to determine the effect of physical activity on exercise behavior, body composition, muscle strength and flexibility, and cognitive and emotional function. These are all important components of long-term health. There are no published studies designed to determine the appropriate type and dose of physical activity to optimize health following a cancer diagnosis.
- < There is enough information on the benefits of physical activity to place it among the top 10 leading health indicators for the *Healthy People 2010* program. In spite of that fact, more than half of U.S. adults do not meet current physical activity recommendations and nearly one-quarter remain completely sedentary.
- < Older adults are the least active of all age groups, as demonstrated by data from the National Health Interview Survey. In 2002, 60 percent of those aged 75 years and older reported no physical activity. Physical activity research among older cancer survivors is important since the combined effects of age and treatment may contribute to compromised long-term health in this age group.
- < Lower socioeconomic status may influence physical activity participation as well. Physical activity levels of minority populations, who are often of lower socioeconomic status, are lower than those of the general population. Data from the Behavioral Risk Factor and Surveillance Study have shown that nearly half of respondents with less than a high school education reported no physical activity; these rates are twice as high as those reported among the general population.
- < Engagement in healthy behaviors may be influenced by where people live. Adults living in rural areas are more likely to rate themselves in poor health, at higher body weight, and less active compared with urban adults. Rural adults are less likely to meet physical activity recommendations. Programs within and across states need to consider the cultural and environmental determinants of activity behavior and specific programs may need to be developed and tested to promote physical activity among rural Americans.
- < Recently, awareness of the influence of the built environment on physical activity levels has grown. Research among adults has found a direct relationship between the convenience of places to walk and the ability to meet physical activity recommendations.

- < Physical inactivity and poor diet have been blamed for nearly as many deaths as tobacco and result in significant health care costs. Physical activity studies that include a cost/benefit analysis could convince government and business to invest in activity-promoting endeavors.
- < Dissemination of information and development of effective evidence-based physical activity interventions are essential to changing the behaviors of the American public. Interventions that could foster change include providing pointed advisory messages (e.g., signs that urge the use of stairs instead of elevators); expanded physical education programs in schools; and modifications of the community environment to encourage physical activity.
- < Two examples of CDC-supported physical activity programs that have been evaluated and are considered adaptable on a national level are the Coordinated Approach To Child Health (CATCH) program for improved physical activity and diet in elementary school children and the Senior Center Exercise Program for older adults, also called Enhanced Fitness. Both programs increase physical activity among their target populations and are proven to be sustainable.
- < In 2003, Oregon established a statewide physical activity program, including a very successful Kids Walk to School Campaign. The Oregon Partnership for Cancer Control issued the Oregon Comprehensive Cancer Plan in 2006 that addresses the role of physical activity in cancer prevention and survival. Numerous community programs also exist in Oregon, including a Cancer Care Resources Empower Fitness Program that offers free exercise classes to cancer survivors. The African American Health Coalition's CDC-funded Racial and Ethnic Approaches to Community Health (REACH) program also offers free physical activity classes within the community. These programs have great potential to alter health behaviors and reduce the burden of cancer in Oregon. However, adequate funding must be secured in order to ensure their long-term success.

DR. DAVID HEBER: Diet, Obesity, Fat Cells, Inflammation, and Cancer

Background

Dr. Heber is the Director of the UCLA Center for Human Nutrition at the University of California, Los Angeles. He has been on the faculty of the UCLA School of Medicine since 1978 and is currently Professor of Medicine and Public Health and the founding Chief of the Division of Clinical Nutrition in the Department of Medicine and the founding Director of the UCLA Center for Human Nutrition at UCLA. Dr. Heber directs the NCI-funded Clinical Nutrition Research Unit and the NIH Nutrition and Obesity Training Grants at UCLA. He is a Director of the American Board of Nutrition and past Chair of the Education Committee of the American Society of Clinical Nutrition. He was recently elected Chair of the Medical Nutrition Council of the American Society for Nutrition. He has written two professional texts (*Dietary Fat, Lipids, Hormones* and *Tumorigenesis and Nutritional Oncology*) and four books for the public. His main research interests are obesity treatment and nutrition for cancer prevention and treatment.

Key Points

- < The blood vessels created by tumors through angiogenesis are very inefficient in delivering oxygen to tumors. Thus, tumors must adapt to low levels of oxygen in order to grow; inflammation plays a role in this process.
- < Malnutrition causes immune dysfunction, which leads to susceptibility to infectious diseases. Obesity, on the other hand, leads to immunoactivation and susceptibility to inflammatory diseases.

- < Inflammation causes insulin resistance in fat cells, in the liver, and in muscles. This can lead to higher levels of insulin and insulin-like growth factor hormones that stimulate the cancer process.
- < Insulin resistance also increases the amount of estrogen by up-regulating an enzyme called aromatase. Breast cancer cells are stimulated to produce aromatase by nearby fat cells that secrete a cytokine called IL-6. This metabolic syndrome is common in women over 50 with heart disease, diabetes, and some forms of cancer. Women with breast cancer are sometimes given drugs called aromatase inhibitors.
- < Inflammation has been labeled as a “secret killer” by the popular press. Almost half of the U.S. population carries a genetic predisposition to develop the positive energy balance that leads to abdominal obesity, increased production of insulin-like growth factor, and inflammation. The answer to this problem cannot be found through pharmacological approaches, as illustrated by the problems associated with the anti-inflammatory drug Vioxx. A better approach is to reduce the incidence of obesity and increase consumption of anti-inflammatory phytonutrients and detoxifying enzymes available in fruits and vegetables.
- < Two fats referred to as essential fats because the human body cannot produce them, linoleic acid (which produces the Omega 6 fatty acid) and linolenic acid (which produces the Omega 3 fatty acid), are derived from plants. In fruits and vegetables, the acid ratio of linoleic to linolenic is about 3:1. In the average American’s bloodstream, the ratio ranges from 10:1 to 30:1. This has resulted from efforts by the food industry to extend the shelf life and enhance the appearance of processed foods. Omega 3 is much more difficult to preserve than Omega 6.
- < Omega 3 is converted in the body to antiinflammatory substances, while Omega 6 is converted to proinflammatory substances. Thus, an imbalance between these fatty acids increases inflammation.
- < A study that compared Omega 3 and Omega 6 levels in Japan and the United States found that the Japanese tissue and blood samples contain 40 percent Omega 6, compared with 80 percent among Americans. Similar findings resulted in comparisons between urban and rural residents of Quebec and China.
- < There is evidence that proliferative inflammatory atrophy in the prostate may be a precursor of prostate cancer. Examination of prostate tissue removed during surgery has demonstrated that tumors often occur in peripheral areas affected by decreased oxygenation and increased inflammation.
- < It has been found that cancer cells can deactivate antioxidant defense enzymes that would normally trap and inactivate oxygen radicals, so that the cancer cells produce more oxygen radicals that allow them to grow more rapidly. An early cancer lesion, from a genetics perspective, is not the same disease as a late lesion. The cancer genome changes over time to benefit itself, and the genomic damage that occurs helps the early lesion progress to aggressive prostate cancer and ultimately to a hormone-independent, aggressive cancer that is difficult to treat. Unfortunately, oncologists have been treating cancer after it is diagnosed very late in this process, at which point they find a cancer cell that is very difficult to deal with because it has already had the opportunity to adapt.
- < Intake of fruits and vegetables not only benefits the body by bringing in phytonutrients but also by stimulating phytochemical-metabolizing enzymes, which are important in detoxifying the body. Consumption of fruits and vegetables also contributes to weight control because they have fewer calories per serving than other food groups.

DR. KAREN GLANZ: The Role of Built Environments in Physical Activity, Nutrition, and Obesity

Background

Dr. Glanz is a Professor of Behavioral Sciences and Health Education, a Georgia Cancer Coalition Distinguished Research Scholar, and Director of the Emory Prevention Research Center at Emory University's Rollins School of Public Health. She is also an Adjunct Professor in the Department of Hematology and Oncology at the Emory School of Medicine and a member of the Winship Cancer Institute Population Sciences Program. From 1993 to 2003, she was Professor and Director of the Social and Behavioral Sciences Program at the Cancer Research Center of Hawai'i at the University of Hawai'i. From 1979 to 1983 she was a Professor in the Departments of Health Education and Medicine at Temple University in Philadelphia, and a member of the Division of Population Sciences at the Fox Chase Cancer Center. Dr. Glanz's research emphasizes studies of modifiable risk behaviors, early detection, social and health policy, and the use of new health communication technologies for disease prevention. She and her team are committed to conducting scientific research with promising short- and long-term application to improved community health, health care, and public health services.

Key Points

- < Many people believe that we have built a world that supports unhealthy habits. Our transportation infrastructure and neighborhood design support driving rather than walking or biking. The traditional grid-like street pattern seen in older American communities is being replaced in new developments by a system of cul de sacs without sidewalks that make it impossible to move from one place to another without driving. Portion sizes have become inflated, eating opportunities have proliferated, and there are many options for sedentary entertainment.
- < Built environment changes are essential for long-term solutions to the obesity epidemic. The controversy of individual choice versus environmental determinism is not a scientific question but a philosophical or political issue. A better understanding of the relative contributions of individual factors and environments is needed. How does someone who lives in a built environment that does not support physical activity and offers only junk food choices maintain a healthy weight or eat a healthy diet? Measuring the built environment is an enormous challenge, but many researchers are now beginning to address these questions.
- < When examining the built environment, the types of physical activity of interest are active recreation, active transport, and sedentary behavior.
- < For young people, active recreation takes place primarily at outdoor neighborhood locations, such as parks. A number of studies have shown disparities in access to high-quality recreational facilities in neighborhoods in which minority and low-income populations live. Emerging data also suggest that crime and perceived safety affect the use of recreational facilities.
- < Adults are more likely to walk or ride a bicycle instead of driving short distances in grid-based neighborhoods with a mixture of residential, educational, and retail buildings. The additional time spent on physical activity by walkers and bikers is sufficient to reduce BMI.
- < There has been a downward trend in walking or biking to school among children for the past three decades. The Safe Routes to School program in Oregon has led to an increase in walking of more than 60 percent and an increase in biking of more than 100 percent in some neighborhoods.
- < A neighborhood quality-of-life study conducted in San Diego that looked at correlates of active commuting found that in highly walkable neighborhoods, more than twice as many

children actively commuted to school than in less walkable neighborhoods. Significant correlates included land use mix, street connectivity, and parents' concerns about the safety of walking.

- < Sedentary behavior seems to be affected by different factors than those that relate to active commuting or active recreation. Television, video games, and computers are all part of our daily life. Several studies have documented that as many as 60 percent of all children have televisions in their bedrooms.
- < One large study conducted in the Atlanta metropolitan area indicated that, among adults, more time spent riding in cars has been associated with obesity.
- < The association between the built environment and nutrition is not as well documented as its association with physical activity. The reliance of the U.S. population on fast, convenient foods has grown in recent years. Americans often eat at chain restaurants that serve high-fat, high-calorie, inexpensive foods. Portion sizes have been increasing for the past 50 years.
- < The built environment affects nutrition on two levels. At the community level, relevant factors include store and restaurant location. At the individual consumer level, relevant factors include the variety of available foods, the cost and quality of those foods, and access to nutritional information that shoppers encounter in stores and restaurants.
- < Measures of the nutritional environment are being tested, such as comparisons of the availability and costs of healthy foods. In disadvantaged neighborhoods, healthy foods are usually more expensive and lower quality than other foods, and often are not available at all. In areas served by supermarkets, consumption of fruits and vegetables is higher than in neighborhoods served only by small markets or corner stores.
- < Observational measures have been made in a sample of more than 200 restaurants. Using government guidelines for healthy eating, it was found that approximately 21 percent of the sit-down restaurants and 36 percent of the fast-food restaurants made healthy foods available. Among those that did offer healthy items, those items comprised no more than 10 percent of their menu items. Only about 11 percent of salad items included fruit. Few restaurants offered healthy choices on children's menus.
- < A recent study supported by RWJF looked at how restaurants make decisions about menu options. Interviews with executives and marketing professionals revealed that decisions are made based on potential sales and profits. Most of those interviewed expressed the belief that their customers are not interested in healthy alternatives.
- < Some intervention studies are evaluating methods for improving the built environment so that it is more conducive to physical activity and better nutrition. Long-term longitudinal studies are needed to produce evidence that improved environments can lead to improved health behaviors and outcomes. The CDC and RWJF have initiated a few such studies.
- < Point-of-purchase studies to examine the effect of environmental changes on nutritional choices have produced mixed results. Changes in pricing and availability of healthy foods in some schools have resulted in better options, but in most studies have not resulted in increased self-reported consumption of those foods.
- < Promising ideas being evaluated in communities around the country include providing transportation in lower-income communities for shopping; bringing supermarkets into the inner city; and bringing produce into inner-city and low-income neighborhoods.
- < Research on nutrition, physical activity, and the built environment should be integrated to address these related problems in a comprehensive way.

DISCUSSION: PANEL II

Key Points

- < Although physical activity is an important factor in maintaining weight loss, the only way to accomplish weight reduction is through caloric restriction. The diabetes community has met with success in promoting weight loss through meal replacement—substituting shakes fortified with vitamins, minerals, and fiber for traditional meals. This approach was once considered ineffective by nutritionists, but is now proving to be useful.
- < Complying with the ACS recommendation of maintaining a healthy weight requires a combination of personal responsibility and societal support. Individual behavior change is essential, but can only be achieved if the opportunity to make changes is available—for example, people can switch to whole grains only if whole-grain options are provided by grocers.
- < Nutrition and physical education must be taught side-by-side in schools to have a beneficial effect on BMI among children. The elimination of home economics from most schools means that young people are no longer being taught how to prepare healthy meals.
- < Changes in the way foods and beverages are made available in schools, workplaces, and communities will have a broad economic impact that must be taken into consideration in the development of new policies.
- < Many people cite a lack of time as the primary reason for failure to engage in physical activity. Efforts to provide better access to exercise facilities must be accompanied by efforts to educate the public about the benefits of exercise and encourage people to incorporate physical activity into their daily lives. The sedentary lifestyle should be approached as a disease condition that can be treated with appropriate interventions. The emphasis should not be on weight loss, which is perceived as a difficult goal, but on healthy living.
- < Although some employers now consider provision of workplace opportunities for physical activity to be a normal aspect of the cost of doing business, research is needed to determine whether encouraging people to exercise at work is really more effective than making it easier for them to do so in their own neighborhoods.
- < Social support networks are important in helping people follow through with physical activity over time.

PUBLIC COMMENT

Key Points

- < A review of reports from the President’s Cancer Panel over the past several years shows that little attention has been paid to the topic of cancer induction with occupational and environmental exposures to established carcinogens. The Panel will consider this topic in planning for future meetings.
- < States and municipalities usually departmentalize recreation and health programs, with little coordination or collaboration between those responsible for these issues. Recreation and health programs need to coordinate their activities, facilities, services, and recommendations.
- < The President’s Council on Physical Fitness should reactivate its program of measuring physical fitness in schools to increase awareness of the importance of physical education.
- < Policies that are not targeted to questions about health often have unintended health consequences. State laws that have passed to reduce property taxes have left schools with reduced revenues, often resulting in reduction or elimination of physical education programs.

PANEL III

DR. KENNETH REED: P.E.4Life

Background

Dr. Reed is the Director of the P.E.4Life Center for the Advancement of Physical Education (CAPE). He is the author of P.E.4Life's *Blueprint for Change*, an overview of the physical education landscape and a 10-step action plan for physical education stakeholders. Dr. Reed is a Faculty Fellow for the National Institute for Sports Reform (NISR) and a member of the NISR Executive Board. He serves on the Metropolitan State College of Denver's Sport Industry Operations Advisory Board and is the regular sports issues columnist for *Mile High Sports* magazine. Dr. Reed has also had a distinguished career as a sports industry consultant. He has developed numerous marketing, communications, public affairs, and sales plans for sports industry executives, including clients in the National Football League, National Basketball Association, National Hockey League, Professional Golfers' Association, and National Pro Fastpitch. He has taught several sport studies courses and published numerous articles on contemporary sports issues.

Key Points

- < The United States is experiencing a physical inactivity epidemic. Sixty-five percent of Americans are overweight or obese, including 35 percent of American children. The current generation of children is on track to be more obese than their parents. Studies have shown that children and adolescents who are overweight by age 8 are 80 percent more likely to be overweight or obese as adults. The percentage of overweight children ages 6 to 11 has increased nearly 300 percent over the past 25 years. Even more disturbing is the fact that the incidence of high blood pressure and Type 2 diabetes, which were once considered adult problems, is now increasing dramatically in children and adolescents. Depression and attention deficit disorder are also linked with the rise of physical inactivity.
- < Daily physical education was once the norm in American schools. Today, only 8 percent of elementary schools, 6.4 percent of middle schools, and 5.8 percent of high schools offer daily programs. Thirty-three percent of U.S. children are captive television watchers for more than 3 hours per day and 75 percent are active less than 20 minutes per day.
- < P.E.4Life is a national nonprofit organization founded in 2000 with the sole purpose of increasing the amount of quality health-and-wellness-based physical education programs offered on a daily basis in schools across America.
- < Most PE programs have changed little over the past several decades, and attitudes toward PE are negatively affected by certain features of those programs, such as favoritism toward athletically gifted children. P.E.4Life places an emphasis on getting all children involved in physical activity and places less emphasis on team sports. It teaches about the lifetime health and wellness benefits of physical activity and integrates PE with other school subjects.
- < While technology has changed other academic subjects, it has had little impact on PE until recently. P.E.4Life is using technology in assessing student progress toward personal fitness and physical activity goals. Pedometers and heart rate monitors are used to encourage children to compete against themselves and not others. Grading is based on effort. Children who work very hard on running a mile can get higher grades than athletes who beat them by a minute or two but do not put in enough effort to elevate their heart rates.
- < The use of technology in P.E.4Life programs focuses on things like aerobic capacity, flexibility, blood pressure, and body composition. Thus, the program can show measurable

outcomes, which has been very helpful for school boards and administrators who are making budget decisions on whether to continue to support PE programs.

- < P.E.4Life is a scalable model. Six demonstration and training centers called P.E.4Life Academies have been established in schools across the country that have exemplary health-and-wellness-based PE programs. Community leaders (including physicians, school board members, and business owners) from other locations are brought to these Academies for 2-day training sessions that prepare them to create P.E.4Life programs in their own communities. Each community develops a unique advocacy strategy for building daily PE programs. They also develop assessment plans to monitor progress and make needed adjustments. The Academies think of themselves as “change agents” for American communities.
- < In the coming year, the network will be expanded to 25 P.E.4Life Academies. The ultimate goal is to establish at least one Academy in every state.
- < The program has initiated efforts to scientifically measure the effects of P.E.4Life. In addition to measures of health and wellness, the program is looking into its effects on academic performance and mental health among children who participate.
- < Preliminary data show that children participating in a P.E.4Life program in one California city scored higher on measures of fitness than children statewide. Students with high scores across the range of fitness measures have also been shown to be more likely to perform well academically compared with students with lower fitness scores. Students at one program who tested poorly in reading skills were enrolled in a morning PE class followed by literacy training; these students improved their reading skills by an average of 50 percent. Anecdotal evidence from another P.E.4Life program suggests that these types of activities help reduce disciplinary problems.

MS. DANIELLE KILLPACK: NikeGO Head Start

Background

Ms. Killpack is Senior Manager of Corporate Responsibility for Nike, Inc. She is responsible for Nike’s signature children’s program, NikeGO, U.S. employee volunteer programs, U.S. community advocacy programs, civic and charitable giving programs, diversity grant making, and Nike’s community stakeholder relationships. Prior to assuming this position, Ms. Killpack served as Communications and Public Affairs Director for Albertsons, Inc., one of the world’s largest food and drug retailers, where she managed internal and external communications, local government relations, and charitable giving programs across 20 western states. She has also worked in state legislative offices and spent 4 years in public relations and communications in the technology industry.

Key Points

- < Head Start is a component of Nike’s signature NikeGO children’s programs that are focused on giving children the means to be active. Nike is a company that is focused on physical activity, sports and individual performance. The company’s Corporate Responsibility Department decided several years ago that its “give back to the community” strategy should focus on children.
- < NikeGO supports PE programs in more than 300 schools across the nation. In partnership with the National Head Start Association, NikeGO Head Start has established preschool programs in more than 120 schools and plans within the next year to expand its activities to almost 200 schools.

- < For preschoolers, physical activity not only promotes health but also contributes to learning and development. The National Association of Sport and Physical Education Guidelines recommends that each day preschoolers engage in 60 minutes of structured physical activity that promotes health-related fitness and movement skills, at least 60 minutes of unstructured physical activity, and no more than 60 minutes of sedentary activity other than sleeping.
- < Nike teamed with the National Head Start Association and solicited input from the CDC and the U.S. Surgeon General's Office to ensure the credibility and effectiveness of its preschool program. A nonprofit organization called Sports, Play, and Active Recreation for Kids (SPARK) helps in curriculum development and teacher training. Nike pays for the training and helps arrange for volunteer teachers, since the Head Start program does not have salaried teachers.
- < Objectives include providing high-quality, developmentally appropriate physical activity programs as an easy-to-use resource for Head Start staff and families; providing parents with strategies to increase the physical activity of their children outside the Head Start environment; enhancing children's innate love of physical activity; developing children's basic movement and manipulative skills, physical fitness, and social skills; and building sustainability into physical activity programs and integrating into existing curricula.
- < Having just completed its first year, the program has begun the task of evaluating progress, cataloging lessons learned, and measuring outcomes.
- < NikeGO Head Start uses playbooks designed for preschoolers. Playbooks describe activities, specify needed equipment, and provide links to the Head Start curriculum and guidance for family activities. No one stands and watches others in NikeGO Head Start activities: teachers are actively involved and all children in the class are involved throughout each activity. The programs use equipment provided by Nike.

MR. JONATHAN LEVER: YMCA Activate America

Background

Mr. Lever is Director of YMCA Activate America, a national initiative in response to America's growing obesity and chronic disease crisis. In this role, he oversees the strategic development and implementation of the initiative. Immediately before joining the YMCA, he was the inaugural Chief Executive Officer of the Nonprofit Center of Northeast Florida, Inc., an organization that provides management, legal, and advocacy assistance to nonprofits. Previously, he practiced philanthropy law at the Boston law firm of Choate, Hall & Stewart. In his legal practice, he advised individuals on personal charitable giving matters and advised foundations and public charities on operational, governance, and tax matters. Prior to practicing law, Mr. Lever served as a program officer at the Jessie Ball duPont Fund, one of the largest private foundations in the Southeast, where he directed the foundation's grant making to religious institutions. He also previously served as a research associate at Harvard University's Hauser Center for Nonprofit Organizations.

Key Points

- < The YMCA of the USA is the national resource office for the more than 2,600 YMCAs across the country. YMCAs operate in 8,000 elementary schools, middle schools, parks, pools, churches, and other community sites. Approximately 72 million households are located within 3 miles of a YMCA. Approximately 47 percent of the organization's 20 million participants are under the age of 18, most of whom are between the ages of 6 and 11.
- < YMCA Activate America is a nationwide public health initiative that involves YMCAs in promoting healthy lifestyles for families and communities. Its focus is on reinventing the

YMCA experience and reinventing the organization itself. The program endeavors to help its participants change from passive, well-intentioned, but frustrated “health seekers” to committed exercisers. In the U.S. population, approximately 15 to 20 percent of adults are committed exercisers, approximately 30 to 35 percent could be described as “committed couch potatoes,” and those in the middle fit the description of health seekers. People at risk of cancer and cancer survivors are well represented among the many health seekers who struggle to sustain a commitment to health and wellness.

- < The traditional YMCA experience focuses on the facility. People who ask about membership are given a tour and shown the available equipment. However, health seekers are less interested in facilities and equipment than in their health-related concerns. YMCA Activate America hopes to change the YMCA’s focus from the facility to the individual. Staff are encouraged to adopt a “listen and introduce” approach. Before starting a tour, staff ask potential members what motivated them to come to the YMCA and what they hope to achieve through membership. Many of these people turn out to be health seekers who are trying to find ways to live healthier lives. Experience has shown that these motivational interviews can help people discover and overcome their barriers to behavior change.
- < The reinvention of the YMCA experience is a challenge for many staff with backgrounds in physical education or kinesiology because they became involved in their work to help athletes rather than health seekers. In the future, the organization will include counseling and communication among the skills needed to serve members. Staff will focus on making members and the community feel connected with the YMCA. Health seekers are more successful in reaching their goals when they receive support through personal relationships. Programs that appeal mostly to committed exercisers (e.g., high-impact aerobics) are being redesigned to appeal to a broader range of interests and needs. More family-oriented activities are being offered. The YMCA is embedding healthy practices, including organized physical activity and healthy snacks, into its child care services and facilities.
- < The YMCA is calling upon outside experts like physicians, nutritionists, and public health organizations for assistance in designing its programs and activities. A growing list of strategic partners is involved in the reinvention of the YMCA.
- < The YMCA reinvention initiative is based on the Institute for Healthcare Improvement’s Breakthrough Series, which is used extensively in the health care industry as a way of improving patient outcomes. It is a disciplined, data-driven, yet flexible mechanism for achieving the transformations the YMCA plans to implement. The reinvention initiative is being rigorously evaluated by the Harvard School of Public Health.
- < The YMCA is planning an explicit focus on chronic diseases, such as cancer. Recently, the YMCA signed a multi-year agreement with the Lance Armstrong Foundation and will be working intensely with them to pilot and test cancer survivor programs in the area of physical activity and wellness. The initiative will start with a group of pilot sites at YMCAs; following evaluation and identification of best practices, the program will be disseminated throughout the YMCA and to other organizations around the country.
- < The YMCA feels that it has an obligation to serve as an advocate for health and wellness in the community. Each year for the past 3 years, the YMCA has convened a group of civic and local leaders, brought them to Washington, and given them tools and resources to develop a healthy living intervention on a community-wide basis. These core groups have gone back and implemented initiatives in their communities over a 2-year time span. The YMCA now has teams operating in 48 communities advocating for school PE programs, healthier school lunch menus, and other improvements. The work of one group led to a ban on new residential developments without sidewalks.

- < The YMCA has been selected as a partner in the CDC's Steps to a HealthierUS program, providing technical assistance to 40 Steps communities around the country.
- < Each year on YMCA Healthy Kids Day, an annual celebration of children's health and wellness, more than 500,000 people attend this event at more than 1,400 YMCA sites.
- < Recently, the YMCA participated in America on the Move Week, through which more than 800,000 people logged 9.3 billion steps during 1 week at their local YMCAs.

MS. LADONNA REDMOND: Chicago Food Systems Collaborative—A Food Justice Model

Background

For 7 years, Ms. Redmond worked to create a structured residential program in Chicago's west side community for women who were ex-offenders and substance abusers. She has also worked as a coordinator of rehabilitation programs for young adults. The main reason Ms. Redmond is now working in the area of sustainable food security is the fact that her son, Wade, was born with severe food allergies and asthma. He is allergic to all dairy products, eggs, and peanuts. While trying to create healthy, nutritious meals, Ms. Redmond learned for the first time about genetically modified food, the heavy use of pesticides, and food irradiation. None of these issues was being discussed where people of color lived. Currently, she is President and CEO of the Institute for Community Resource Development, a nonprofit, community-based organization located in the West Garfield community that assists residents of urban communities to obtain access to safe, healthy food through the development of alternative food systems. She and her husband, Tracey, are also involved in developing an urban farm in partnership with the University of Illinois.

Key Points

- < In many communities, health, economic, and other problems are caused or exacerbated by problems with self-actualization. People lack the resources they need to meet their own needs.
- < Ms. Redmond's son is allergic to shellfish, peanuts, eggs, and milk. She has been frustrated by lack of support from the medical community in caring for him. They told her to avoid the foods he was allergic to, but they did not help her learn what kinds of foods he could eat and which he should avoid because they contained hidden ingredients that would harm him. A friend, who is a biochemist, was able to tell her that some food additives are dangerous because they have the same properties as eggs or milk, although they have different names.
- < Ms. Redmond began to educate herself about food production and became interested in the reasons why economically disadvantaged neighborhoods, like the west side of Chicago, did not have access to quality foods in their grocery stores. In her experience, shopping was a tedious process because she had to visit multiple stores, some far away from home, to find what she needed. Her neighborhood had many places to buy cigarettes and alcohol within walking distance, but not a wide variety of foods.
- < She became a community activist to address what she calls the politics of food. Food production has involved issues related to social justice for many years. In 1861, the Homestead Act was enacted to promote the expansion of agriculture. However, when African Americans were emancipated in 1863, they were not provided with access to land that the Homestead Act provided to other Americans.
- < Starting in the 1930s, the mechanization of agriculture reduced labor requirements and placed control of the food industry in the hands of smaller numbers of powerful companies. During recent decades, technological developments have led to the biological and chemical alteration

of many foods in the interest of appearance and shelf life, rather than health and nutrition. Control of knowledge about food production has passed from farmers to chemists and engineers.

- < Following the Second World War, many soldiers returned to family farms. Price supports were implemented to ensure the incomes of farmers. This system collapsed in the 1980s, leading to widespread bankruptcy.
- < Today, 75 percent of American food purchases take place in supermarkets, which are a relatively recent phenomenon. The average supermarket is a 40,000-square-foot store. But some neighborhoods do not have access to the convenience and variety of options provided by supermarkets. In Ms. Redmond's neighborhood, there are 84 corner stores but only one supermarket.
- < Ms. Redmond and her colleagues initiated the Chicago Food Systems Collaborative, which improves the quality of food choices for Chicago residents. This organization is a university-community collaboration with numerous partners. Support from partners like the Kellogg Foundation and RWJF provides welcome financial assistance, but the most important relationships are those created within the community. One of the most important partners is the Pembroke Farming Community, a group of African American farmers located approximately 70 miles from Chicago. The Collaborative's core value is sustainability, with an emphasis on economic viability, environmental soundness, and social justice.
- < The Collaborative's research component has examined school-based nutrition projects. The group compared two schools in the Austin community and established the Cool Food Salad Bar Project, which was supported by RWJF. Large-scale wasting of food was discovered in school-based programs, primarily because students were not allowed enough time to eat. It was also found that the majority of main courses in schools consisted of fried foods. It was concluded that improved interactions between food service staff and students, as well as efforts of teachers to serve as role models, could improve students' willingness to eat healthier foods. Nutrition education proved to be effective in changing students' awareness about healthy foods.
- < A second research effort was the Market Basket study, which surveyed grocery stores in an Austin neighborhood to learn about the cost and availability of food. There were three supermarkets and 50 corner stores in the neighborhood. Of the corner stores, 34 sold produce, but 19 of those sold low-quality produce. Foods high in fat and sugar were widely available, while organic foods and other foods considered to be healthier were not readily available.
- < As a result of some of these findings, the Collaborative established a farmer's market, recruited the participation of the Pembroke group, and created the Urban Food Project, in which six vacant lots were converted to urban farm sites.
- < The Collaborative has been a successful blending of academic and community-based individuals working together to improve life in the community. Partners have worked very hard to make the project culturally sensitive and participatory.
- < In America today, health and wellness have become upper-class attributes. Transportation and economic barriers prevent lower- and middle-income Americans from taking advantage of opportunities to eat healthier foods. Access to information is another barrier to behavior change. Popular culture should be enlisted to help translate the principles of healthier lifestyles to a broad audience.
- < Public policy changes are also needed. Illinois has created the Illinois Food Systems Policy Council, and Chicago plans to replicate the Pennsylvania Fresh Food Financing Initiative with support from the Kellogg Foundation. These initiatives provide a mechanism for communicating with policy makers about food production and distribution issues. Fair

housing policy and infrastructure are being used as a model for promoting fair food distribution. Financial assistance from philanthropic organizations and government agencies will be required to help put supermarkets into low-income communities.

DISCUSSION: PANEL III

Key Points

- < Anecdotal evidence suggests that the habit of engaging in physical activity during childhood carries over into adult life. Longitudinal studies are being initiated to verify this supposition. One study is investigating the effect on parents' behavior when children engage in physical activity.
- < To select its pilot locations, the Nike Head Start program worked with Head Start leaders to identify populations of children with low levels of access to physical activity programs and resources.
- < With the support of the Mayor of Chicago, the Chicago Food Systems Collaborative cut through red tape and obtain the cooperation of city Aldermen. The assistance of state legislators with a personal interest in food-related issues also greatly benefited the project.

PUBLIC COMMENT

Key Points

- < There are significant barriers to cancer survivors who want to engage in physical activity. Some health clubs discriminate against cancer survivors because they believe their presence will hurt the business. Some survivors need tailored programs, and many people who work in clubs lack the expertise to advise them. Modified facilities are also important to many cancer survivors. Forms that clients of clubs must complete reveal medical information that club personnel are not qualified to evaluate. Finally, many cancer survivors are on tight budgets and cannot afford the fees charged by health clubs.
- < The culture of organized physical activity in schools needs to be changed. Only a small percentage of adults choose team sports as a means of exercising, but most school PE programs emphasize team sports.
- < Although school-based programs are important in meeting the needs of children, nationwide nonprofit organizations that serve children must be included in addressing these issues. The efforts of small, local organizations should be supported, but their approaches cannot be replicated on a large scale without the infrastructure that larger organizations can provide.
- < Communities and policy makers may forget the titles and conclusions of research studies, but they will remember the stories of people affected by lack of access to healthy foods and opportunities to engage in physical activity. Telling stories is a powerful way to enact change.

CLOSING REMARKS—DR. LEFFALL

Dr. Leffall thanked Panel member Dr. Margaret Kripke and the invited speakers. He concluded that the Panel has listened carefully, will fully discuss this testimony, and will make its recommendations to the President and Congress.

CERTIFICATION OF MEETING SUMMARY

I certify that this summary of the President's Cancer Panel meeting, *Promoting Healthy Lifestyles to Reduce the Risk of Cancer*, held December 5, 2006, is accurate and complete.



Certified by:

Date: March 2, 2007

LaSalle D. Leffall, Jr., M.D.
Chair
President's Cancer Panel