

CAM AT THE NIH

FOCUS ON COMPLEMENTARY AND ALTERNATIVE MEDICINE

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Tips for Talking With Your Health Care Providers About CAM



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Like many Americans, you may be using or considering some form of CAM. If so, it is a good idea to talk with your health care providers about your CAM use. This information explains why and offers some tips to help you get the conversation started.

Key Points

- Tell your health care providers about all the complementary and alternative practices you use. Give them a full picture of what you do to manage your health. This will help ensure coordinated and safe care.
- Be proactive. Don't wait for your health care providers to ask about your CAM use.

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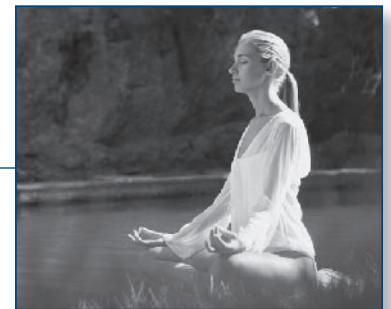
U.S. DEPARTMENT OF HEALTH
AND HUMAN SERVICES

NCCAM Hosts Meditation Workshop

On July 8 and 9, 2008, experts from a wide range of fields and disciplines who share a common interest in meditation for health purposes—including researchers, clinicians, specialists in clinical trial design, and meditation-scholar practitioners—gathered in Bethesda, Maryland, to assess current scientific knowledge and identify areas of opportunity for future research.

The workshop drew 65 attendees from three countries and was cosponsored by NCCAM, the National Cancer Institute, the National Institute on Aging, and the NIH Office of Behavioral and Social Sciences—as well as the Canadian Institutes of Health Research.

“Meditation for health purposes,” says NCCAM Director Josephine P. Briggs, M.D., “is a part of mind-body medicine, a group of therapies that may alter the physical response to diseases—especially those that are chronic, have a link to stress, and are often difficult to manage and treat. Part of building the evidence base on CAM will include building the evidence, carefully and thoughtfully, on meditation’s biological effects.”



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The workshop’s participants identified a number of areas for focus in future research, including the following:

- Fundamental biological research on the neural mechanisms activated by meditation and influences on the rest of the body, including genetic influences on these responses.
- Developing meditation-based treatments tailored as closely as possible to

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**NCCAM Exhibits
at Upcoming
National Meetings**

American Association
of Medical Colleges,
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Society for Neuroscience,
November 15-19,
Washington, D.C.

Society for
Integrative Oncology,
November 20-21,
Atlanta

NIH Summit: The
Science of Eliminating
Health Disparities,
December 16-18,
National Harbor,
Maryland

**Tips for Talking With Your
Health Care Providers**

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- When you talk with your health care providers about CAM, make the most of the conversation. Bring a list of everything you use, keep a record of the information you receive, and ask questions if something is unclear.

About CAM

CAM refers to health-related products and practices that are not presently considered part of conventional medicine. Examples include herbal supplements, acupuncture, chiropractic manipulation, and many others.

**Reasons for Talking
With Your Health Care
Providers About CAM Use**

- Some CAM approaches can have an effect on conventional medicines. Talking with your health care providers about your CAM use will help ensure coordinated and safe care.
- Doctors, nurses, pharmacists, and other health care providers can help you decide whether a particular CAM therapy is right for you. They can answer questions, suggest reliable sources of information, and point out potential benefits and risks.
- You are an important part of a team that includes all of the health care providers you rely on to manage your health. Giving your team a complete picture of everything you do to take care of your health makes

them your fully informed partners—and it helps **you** stay in control of your own health care.

**Tips for Talking With Your
Health Care Providers
About CAM**

- Don't wait for your health care providers to ask about your CAM use. **Be proactive**—start the conversation.
- Keep a current list of all of your therapies and treatments, including over-the-counter and prescription medicines as well as any CAM products such as herbal and dietary supplements. Also note any medical

considering taking an herbal supplement, you might include:

- Why I want to take the supplement
- How I found out about it
- Is it safe for me to take? Will it interact with any of my medications?
- Is it likely to help me?
- What else should I know about it? Where can I find more information?
- Should I try this? If not, why not? Might something else be better?
- Take a notepad or tape recorder with you. Listen carefully and keep a record of what you find

Tell your health care providers about all of the complementary and alternative practices you use. Give them a full picture of what you do to manage your health.

- specialists or CAM practitioners you see. Take the list with you whenever you visit a health care provider. Be sure to tell your health care providers about all of your therapies and treatments. Also include all therapies and treatments on any patient history forms you fill out.
- Gather information on the CAM therapy you're interested in. You may want to take copies with you; that way, you and your health care provider can refer to them as you talk, and your health care provider can help you evaluate the information.
- Make a list of the things you want to talk about. For example, if you're

- out. You may want to ask a family member or friend to accompany you, so you can compare notes after your visit.
- If something is unclear to you, or if you want more information, don't be afraid to ask. Your health care providers may not be able to answer every question, but they can help you find the answers.

This article was adapted from a new fact sheet, Tips for Talking With Your Health Care Providers About CAM, available (including references) at nccam.nih.gov/health/talkingaboutcam.htm or from the NCCAM Clearinghouse (see box at left). To find out more about NCCAM's Time to Talk campaign and its free educational tools, go to nccam.nih.gov/timetotalk/. ❖

From the Director

During my first year as Director, I have been informed and enriched in my thinking about NCCAM's future directions by many conversations with our stakeholders interested in CAM research—including professional groups, patient advocacy organizations, industry representatives, CAM practitioners, members of NCCAM's advisory council, and colleagues at other NIH institutes and centers.

My primary goal is to build the evidence base on CAM therapies. Some of the most important elements, as I see them, are as follows:

- We need more evidence on **biological mechanisms**. We need to know more about what is going on in the body, from the levels of molecules and cells up to systems and whole organisms, when CAM therapies are utilized. This helps us to make the wisest and safest decisions we can about using them, and it yields important insights into the diseases and conditions under study as well.
- We need expansion of **translational tools** that help us “translate” discoveries made in

the laboratory and real world practices to rigorous research designs. For example, during NCCAM's meditation workshop in July, we discussed that in studies of meditative practices for health purposes, it is important to identify the quantity and quality of the meditation experience. We need more “instruments” (such as innovative questionnaires, biological markers, and computer-based feedback) to address such issues.

- Evidence from **efficacy studies**—on the ability of a treatment to produce a desired beneficial effect in people—has been important, and it will continue to be so.
- We need evidence from what I call “**real world**”

Pain management is an area of research where, I believe, CAM practices have great potential.



Josephine P. Briggs, M.D.

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studies in which, for example, a CAM therapy is studied under the type of “real world” conditions in which it is typically used.

Pain management is an area of research where, I believe, CAM practices have great potential. Chronic pain is a huge burden upon our nation's health, economically and in terms of suffering, and is difficult to manage and treat. We will be studying where CAM could potentially make a difference.

An important part of NCCAM's mission is to develop the kind of evidence that will be useful to the public and health care providers in making health care decisions; to the process of integrative medicine, which is going on all around us; and to health policy makers.

I look forward to informing you of our progress as we move further in these directions.

Josephine P. Briggs, M.D. ❖



Upcoming Talks by the Director

This column lists selected upcoming talks by Josephine P. Briggs, M.D., Director of NCCAM.

October 17, Chicago: Annual Conference, **American Association of Acupuncture and Oriental Medicine**

November 8, Toronto: Fifth Annual Research Symposium, the **Canadian Interdisciplinary Network for CAM Research (IN-CAM)**

November 12, Austin: Annual Meeting, **Consortium of Academic Health Centers for Integrative Medicine**

November 20, Atlanta: Fifth International Conference, **Society for Integrative Oncology**



Staff News

This column announces recent NCCAM staff changes that may be of interest to the scientific and medical communities.

New Appointment

Laura Moen, Ph.D., has been appointed as a health scientist administrator. She will manage a portfolio of program areas, including cardiovascular diseases (basic and preclinical research), type 2 diabetes/metabolic syndrome, drug interactions, and whole medical systems. Dr. Moen, who was formerly with the National Institute of General Medical Sciences, earned her Ph.D. in biochemistry from the University of Virginia.

Departure

Qi-Ying Liu, Ph.D., M.Sc., has left NCCAM after serving for over 4 years as a program officer in such topic areas as biologically based products, botanical-drug interactions, traditional Chinese medicine, and addictive disorders. ❖

Spotlight on Clinical Trials

The clinical trials below are among the many NCCAM-sponsored trials that were recruiting, or planning to start recruitment soon, at press time. To see others, go to nccam.nih.gov/clinicaltrials/alltrials.htm. Readers who do not have access to the Internet can inquire with the NCCAM Clearinghouse (see pg. 2).

Milk Thistle for Chronic Liver Disease

Among the people who have chronic hepatitis C infection (HCV), over half are ineligible for, or do not have a sustained response to, conventional interferon-based drugs used for this condition. Another chronic liver disease, non-alcoholic steatohepatitis (NASH), has no proven treatments. Patients from these two groups are participating in a phase II trial of a preparation of silymarin, the active ingredient in milk thistle. This randomized, double-



Milk thistle

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blind, placebo-controlled trial at four clinical centers is testing silymarin's safety and effectiveness as a treatment for HCV and NASH. The study

should also yield more basic information about silymarin. This study is cosponsored by NCCAM and the National Institute of Diabetes and Digestive and Kidney Diseases.

Principal investigators: Nezam Afdhal, M.D., Beth Israel Deaconess Medical Center, Boston; Michael Fried, M.D., University of North Carolina at Chapel Hill; Victor Navarro, M.D., Thomas Jefferson University, Philadelphia; Rajender Reddy, M.D., University of Pennsylvania, Philadelphia; and Steven Belle, Ph.D., University of Pittsburgh (data center)

More information: Go to www.clinicaltrials.gov and enter "NCT00680407" in the search box.

Yoga in Breast Cancer Survivors

A clinical trial at the University of California, Los Angeles, is looking at Iyengar yoga in a group of breast cancer survivors who have persistent fatigue related to their cancer. In addition to fatigue, the investigators are studying other outcomes such as sleep, depressed mood, pain, quality of life, and the activity of proinflammatory cytokines (a type of substance produced by the immune system). Yoga is being compared with a health education approach.

Principal investigator: Julienne Bower, Ph.D., University of California, Los Angeles

More information: Go to crisp.cit.nih.gov and enter "5U01AT003682-02" in the "grant number" box. ❖

NCCAM Hosts Meditation Workshop

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- specific disorders and populations.
- Pursuing a variety of study types and designs, from epidemiological and observational studies to investigations of effectiveness and safety.
- Increasing the array of validated and standardized measures, tools, and language that are available to investigators to define the meditative experience.

- Improving control group design.
- Supporting collaborative and interdisciplinary research teams. Relevant fields include basic and clinical science, translational science, contemplative practices, clinical trial design, medicine, and biostatistics.

"The shared focus in this workshop among participants with widely diverse backgrounds," says co-chair Susan Folkman, Ph.D., of the University of California,

San Francisco, "provided a clear framework for panel presentations and discussions and allowed ideas to evolve that led to useful recommendations." Co-chair Margaret A. Chesney, Ph.D., of the University of Maryland School of Medicine, Baltimore, said, "The workshop was a very effective, highly interactive forum. One of its important contributions was providing impetus for those present to agree that research is needed to build the evidence base, with

developmental work as an important prerequisite."

NCCAM's lead planner for the workshop, program officer Catherine M. Stoney, Ph.D., also noted the workshop's uniqueness and diversity as well as "the ability of non-meditation researchers to contribute quite valuable and relevant insights, which in turn were integrated into the final recommendations."

A more detailed executive summary of this workshop is posted at nccam.nih.gov/news/2008/070808.htm. ❖



Meet a Member of NACCAM



Margery L.S. Gass, M.D.

Margery L.S. Gass, M.D., is a member of NCCAM's National Advisory Council for Complementary and Alternative Medicine (NACCAM). Dr. Gass is professor of clinical obstetrics and gynecology, and director of the University Hospital Menopause and Osteoporosis Center, in the Department of Obstetrics and Gynecology at the University of Cincinnati. She is also a principal investigator for the Women's Health Initiative—a major 15-year NIH research program studying cardiovascular disease, cancer, and osteoporosis in women. Dr. Gass received her M.D. degree from the University of Cincinnati College of Medicine.

Why do women try CAM for help with menopausal symptoms?

Most women view menopause as a normal and healthy phase of their lifespan. If they are experiencing mild-to-moderate menopausal symptoms, they often prefer to try lifestyle changes and CAM before proceeding with approaches that require an appointment with a provider or a prescription.

In addition, some women are philosophically opposed to using hormone therapy, and others have a medical reason for not using hormone therapy—such as a personal history of breast cancer. Making lifestyle changes and using CAM can be ways for women to take some control over their health and increase their quality of life. Lifestyle changes can include minimizing one's exposure to bright lights and to appliances that give off significant heat, in addition to avoiding bedding that traps body heat too well.

What are some things women can do, from midlife through their later years, to help improve their health and prevent disease?

The key for staying healthy at midlife and beyond is very much the same as in younger years, but doing it even more conscientiously: healthy eating, aerobic exercise, muscle toning, staying fit, and avoiding weight gain and unhealthy behaviors such as smoking.

Women should be aware that it gets harder to lose weight when they get older. It is better to get it under control as soon as possible.

Many women find they have to eat less and exercise more to maintain the same weight they always had.

They should also be aware that what a fitness trainer has young women do may not be appropriate for women at midlife and beyond. For example, doing a lot of "crunches" or sit-ups to improve your abdominal muscles may help flatten your abdomen but may also aggravate pelvic relaxation—a problem that begins for many women in midlife, when the supportive structures holding up the uterus and bladder begin to stretch out and weaken. This causes prolapse of these organs, a slipping down from normal position. Excessive abdominal exercises can actually worsen this prolapse. On the other hand, toning the muscles along the spine (called the spinal extensors) may help prevent some of the forward curvature of the spine that happens with age. Maintaining regular sexual activity helps keep intercourse more comfortable and enjoyable as a woman ages.

Most women view menopause as a normal and healthy phase of their lifespan.

— Dr. Gass



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Are there any areas in women's health that you think are especially compelling or promising for exploration of CAM therapies?

Dealing with the aches and pains of aging is a challenge. In addition, many women have osteoarthritis and fibromyalgia. Effective CAM approaches could have an important role in helping to ease pain and avoid the side effects of conventional medications. Alternatives to hormone therapy are very much needed for the alleviation of severe hot flashes in those women who cannot or do not want to take hormones.

From your service on Council, what do you see as the challenges in CAM research today?

From my perspective, the challenge for CAM research is to put the results of high-quality studies into a broader context. For example, a CAM therapy might not perform as well in a study as a prescription drug with regard

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Study Tests Theory About Prolotherapy Injections for Knee Pain

Ligament and tendon injuries—sprains and strains—are common, accounting for more than 5 million visits to hospital emergency departments in the United States each year. Often these injuries don't heal completely, and the result can be chronic pain, joint problems, and increased risk for osteoarthritis. Because people may not respond to standard treatments such as rest, nonsteroidal anti-inflammatory drugs (NSAIDs), and corticosteroid injections, prolotherapy is becoming increasingly popular as an alternative treatment.

Prolotherapy involves injections of “proliferant” solutions at the pain site. The proliferants are thought to strengthen and “reorganize” injured tissue and decrease pain by creating an irritation that alters the inflammatory process. In an NCCAM-funded study, researchers at the University of Wisconsin investigated whether the three most commonly used proliferants—D-glucose (dextrose), phenol-glucose-glycerine (P2G), and sodium morrhuate—cause an inflammatory response in knee ligaments. They injected the substances into the knees of laboratory rats and examined the tissue after 6, 24, and 72 hours. They also examined tissue from animals in three control groups: no injection, needlesticks, and saline injection.

Compared with no-injection controls, prolotherapy injections produced an inflammatory response, but the response was about the same as that for the needlestick and saline-injection controls. The researchers conclude that the proliferants



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themselves may not be responsible for the inflammatory effect. They suggest that future studies of prolotherapy in animals and people control for the effects of the injection itself.

Reference

Jensen KT, Rabago DP, Best TM, et al. Early inflammatory response of knee ligaments to prolotherapy in a rat model. *Journal of Orthopaedic Research*. 2008;26(6):816-823.

Prostate Genes Altered by Intensive Diet and Lifestyle Changes

A recent pilot study, conducted by researchers at the University of California, San Francisco, suggests that intensive lifestyle and diet changes may alter gene expression (the way a gene acts) in the prostate—possibly affecting the progression of prostate cancer. Although the study's findings suggest directions for future research, such lifestyle and diet changes are not a substitute for proven prostate cancer therapies.

This pilot study, known as Gene Expression Modulation by Intervention with Nutrition and Lifestyle (GEMINAL) and funded in part by NCCAM, included a group of 31 men with low-risk prostate cancer. These men declined immediate surgery, hormonal therapy, or radiation, and participated in an intensive 3-month nutritional and lifestyle intervention while researchers monitored their tumor progression. The men stuck to a low-fat, plant-based diet and took dietary supplements including fish oil, selenium, and vitamins C and E.



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They also participated in stress management activities such as yoga-based stretching, breathing, meditation, imagery, and progressive relaxation; did moderate aerobic exercise; and attended group support sessions.

The researchers created “gene expression profiles” and took samples of the men's RNA before and after the intervention. They found that there were changes in the men's RNA following the lifestyle and diet modifications. Certain RNA transcripts that play a critical role in tumor formation had “up-regulated”

(increased) and others “down-regulated” (decreased).

The researchers concluded that intensive nutrition and lifestyle changes may alter gene expression in the prostate. They believe that understanding how these changes affect the prostate may lead to more effective prevention and treatment for prostate cancer, and recommend larger, randomized controlled trials to confirm the results of this pilot study.

Reference

Ornish D, Magbanua MJ, Weidner G, et al. Changes in prostate gene expression in men undergoing an intensive nutrition and lifestyle intervention. *Proceedings of the National Academy of Sciences of the United States of America*. 2008;105(24):8369-8374.

Additional Resource

What you need to know about prostate cancer. National Cancer Institute Web site. Accessed at <http://www.cancer.gov/cancertopics/wyntk/prostate> on August 1, 2008.

“Research Digest” presents selections from recently published papers based on NCCAM-funded research. For more findings, go to nccam.nih.gov/research/results/. ❖

Researcher Explains Stress-Inflammation Link

Stress is an everyday fact of life for most people. It is becoming common knowledge, however, that stress at too-high “doses,” and/or for too-long periods of time, can cause health problems. Janice Kiecolt-Glaser, Ph.D., an NCCAM-funded researcher, discussed “How Stress Kills: New Perspectives on Stress and Inflammation” in a lecture at NIH on May 9, 2008, in Bethesda, Maryland.



Janice Kiecolt-Glaser, Ph.D.

Dr. Kiecolt-Glaser is well known for her research contributions to psychoneuroimmunology—an interdisciplinary field that studies the relationships among the endocrine system, the nervous system, and the immune system, and how those relationships affect health. She holds the S. Robert Davis Chair of Medicine at the Ohio State University College of Medicine, where she is also professor of psychiatry and psychology and director of the Division of Health Psychology in the Department of Psychiatry. Dr. Kiecolt-Glaser is a member of the National Academy of Sciences.

Cytokine Levels Are Key

Our bodies respond to infection or trauma by mounting an inflammatory response, Dr. Kiecolt-Glaser explained in her opening remarks. Part of this response is the release of proinflammatory cytokines—proteins that attract immune cells to injuries and turn on their healing response. But when a person has a level of proinflammatory cytokines

that is chronically high—as from a chronic or recurring infection or wound (such as a “fist-sized wound in the mouth” called gum disease, or repeated urinary tract infections)—the risk for getting certain age-related diseases and conditions goes up, too, including:

- Cardiovascular disease (heart disease and stroke)
- Type 2 diabetes

- Osteoporosis
- Arthritis
- Some cancers
- Frailty and functional decline.

The most likely culprit is a specific type of proinflammatory cytokine, interleukin 6 (IL-6).

The connection with stress? In a nutshell, stress, too, can raise the production of proinflammatory cytokines—substantially, and when such an increase is not biologically called for. Acute stress can provoke a temporary increase in levels of these cytokines, chronic stress a longer one. Some other factors that drive them up are the aging process, depressive symptoms, and clinical depression. In a double whammy, each also

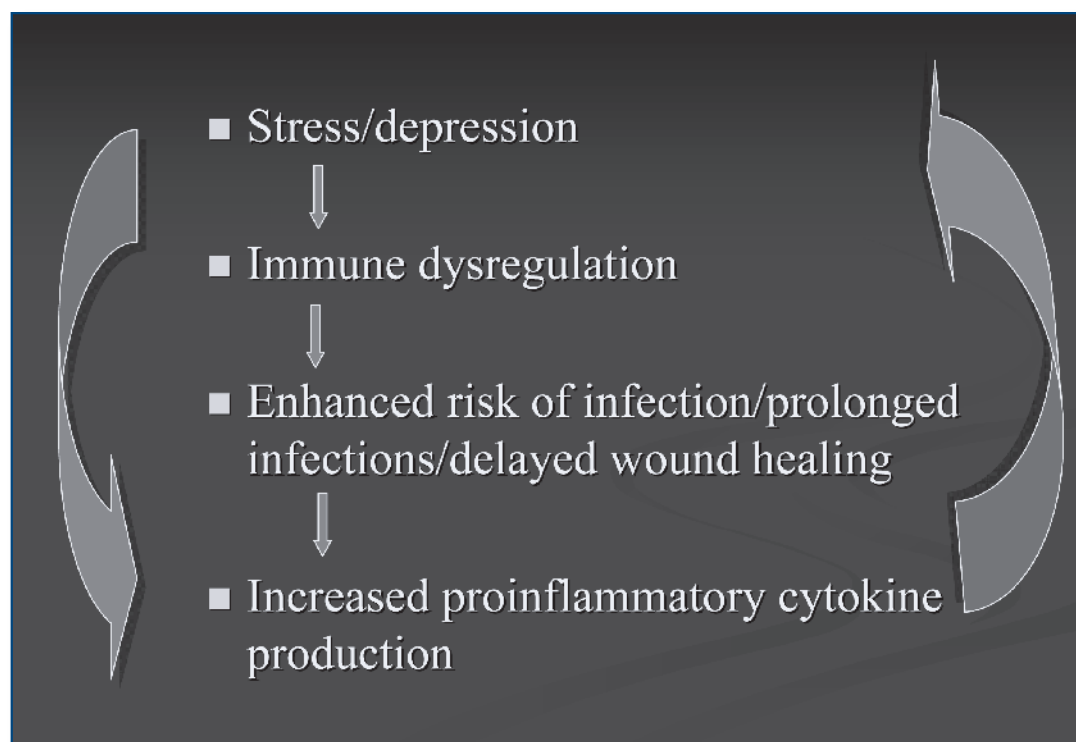
decreases the production of proinflammatory cytokines in places where they are most needed—the sites of wounds and infections.

Dementia Caregiving as a Stressor

Dr. Kiecolt-Glaser discussed her work in some models of states of stress. One consists of caregiving spouses of people who have a progressive dementia disease, such as Alzheimer’s disease. This caregiving is “an important and chronic stressor that takes a large toll on the body,” she said. “It is, actually, a process of living bereavement.”

Her team has found lowered immune function and impaired wound

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A chain of events that begins with stress and/or depression can lead to increased production of proinflammatory cytokines, thus raising the risk for certain diseases and conditions linked to inflammation. Step 4 can lead back to Step 1, thereby increasing stress and depression and potentially creating a cycle.

Janice Kiecolt-Glaser, Ph.D., used by permission

Researcher Explains Stress-Inflammation Link

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healing in study groups of these caregivers. In one study, when given a flu shot, the caregivers had poorer antibody and virus-specific T-cell responses to the shot than did a control group of noncaregivers. This difference widened significantly after age 70. Lowered immunity—and a vulnerability to depression and loneliness—persisted for caregivers for up to 3 years after their ill spouse had died and their caregiving burden had ended. In another study in this population, caregivers took about 24 percent longer than noncaregiving controls to heal a minor puncture wound.

Dr. Kiecolt-Glaser believes that chronic stressors may “prematurely age” the immune response. “Age interacts with stress,” she

Chronic stressors may prematurely age the immune response...and the older you are, the more that stress really matters.

— Dr. Kiecolt-Glaser

said. “The older you are, the more that stress really matters.”

Other Stressed Populations

Dr. Kiecolt-Glaser has observed similar effects in other groups, too. For example, her team administered a small puncture wound to a group of dental school students, doing so once during an exam period and then again during a vacation period. They examined how the wounds healed. All the students took longer (on average, 3 days longer) to heal their wounds during exams than during

vacation; the researchers attribute this to stress. An earlier study in medical students of their response to a hepatitis B vaccine also found indications of lower immune function during exam periods.

“If you’re wounded and you’re stressed,” Dr. Kiecolt-Glaser commented, “you take longer to heal. You also have a greater chance of infection.”

Looking At Other Factors

Dr. Kiecolt-Glaser also discussed the link between stress, proinflammatory cytokines, inflammation, and a number of other health factors:

- **Symptoms of depression:** In some studies, major depression has been found to be associated with increased secretion of these cytokines, and depressive symptoms with increased levels of IL-6.
- **Sleep problems:** Being deprived of sleep alters the body’s secretion of IL-6 by night and day, throwing off the immune system and decreasing the sense of well-being.
- **Health behaviors:** Certain health-compromising behaviors—such as eating a higher-fat diet, getting less exercise, and smoking—have been found to increase IL-6 levels.

- **Fatty acids:** People’s intake of omega-3 and omega-6 fatty acids, including the ratios at which they take them, is an intriguing area, Dr. Kiecolt-Glaser said, and may reflect in part certain historical changes in the American diet.

Currently, Dr. Kiecolt-Glaser is conducting two studies with NCCAM support investigating the effects of omega-3 supplementation and of selected hatha yoga postures traditionally used for the immune system and general restoration; both studies are looking at measures related to stress and well-being.

Dr. Kiecolt-Glaser also conducts other NIH-sponsored research. Her May 9 lecture was sponsored by the National Institute on Dental and Craniofacial Research.

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Meet a Member of NACCAM

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to the main outcome, but the participants using the CAM treatment might have fewer side effects, fewer tests, and more peace of mind. Some women would prefer the CAM scenario to that of the prescription drug where there may be greater efficacy but also more office visits, tests, and side effects. It may not be possible to do this in all studies, but it would be helpful to patients and providers if CAM research can go beyond the primary outcome and capture all aspects of the treatment that patients value.

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- McKenzie M, Sikon AL, Thacker HL, Gass ML. Putting the latest data into practice: case studies and clinical considerations in menopausal management. *Cleveland Clinic Journal of Medicine*. 2008;75(S4):S25-S33. ❖

Of Meditation, Monks, and Music: Dr. Davidson Speaks on Systematic Mind-Body Training

Can people increase their level of happiness—and experience associated benefits to health—by learning and practicing meditation as a skill? The answer appears to be yes, says Richard J. Davidson, Ph.D., of the University of Wisconsin (UW)-Madison. Based on his research, Dr. Davidson likens meditation to certain other trainable skills that produce changes in the brain and body, such as playing a musical instrument or being proficient in a sport. His research group has studied meditation extensively in subjects ranging from Tibetan Buddhist monks who have meditated intensively for decades to college students with no previous meditation experience.

Dr. Davidson spoke at the June 2008 meeting of the National Advisory Council for Complementary and Alternative Medicine. He is Vilas Professor of Psychology and Psychiatry at UW-Madison, and director of that university's Laboratory for Affective Neuroscience and Waisman Laboratory for Brain Imaging and Behavior.

Can Happiness Be Enhanced?

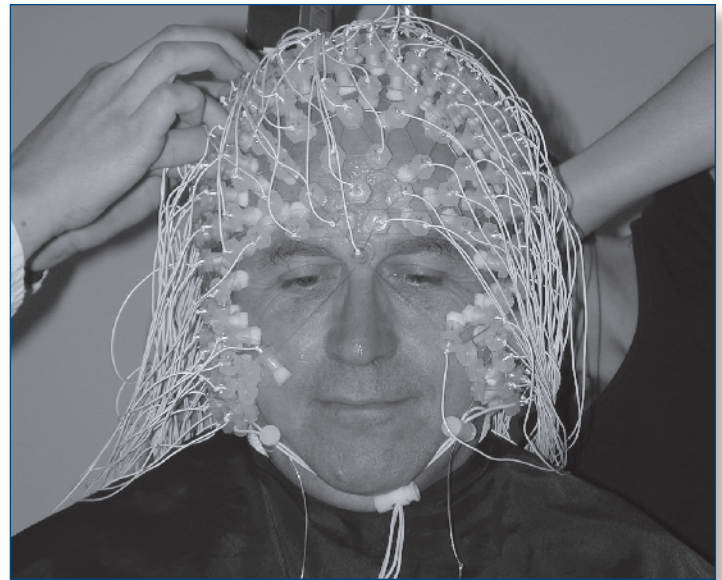
Happiness, Dr. Davidson said in his opening remarks, is an important concern in the United States, with its pursuit guaranteed in our Constitution. It is, he said, "a state, a trait, and a skill." It appears to be health enhancing and to have underlying biological characteristics in the brain and body. But, is biology destiny, where happiness is concerned? Are people stuck at a "set point" for happiness beyond which they cannot move? And, if many things widely believed to produce happiness (such as material

Among his studies' participants are a group of long-term Tibetan Buddhist meditators from Nepal and India.

things) are unreliable in producing it, are there other approaches to consider?

Dr. Davidson believes, based on research, that levels of happiness **can** be changed—significantly—as a result of certain types of systematic training that bring about changes in the brain and body. For this, we can thank the fact that the brain is adaptable and changeable—a property called neuroplasticity. Types of training that aid neuroplasticity, he says, include meditation, musical training, training in a motor skill (such as juggling), physical exercise, and receiving maternal nurturing behavior.

* In the third reference listed on pg. 11, the authors note that numerous contemplative traditions define compassion as "the wish to relieve others' suffering" and define loving kindness as "the wish of happiness for others."



Matthieu Ricard—a geneticist, Buddhist monk, author, and photographer—comes to Madison from Nepal to be studied by Dr. Davidson's team. Here, he has been fitted with a "net" of EEG electrodes.

Waisman Brain Imaging Lab

There is also evidence that levels of some "virtuous qualities" that appear to be associated with happiness—such as compassion,* "loving kindness," and clarity of attention—can also be raised through meditation, Dr. Davidson said.

An Unusual Group of Experts

His team's wide-ranging work has included studies of monks, meditation teachers, and other long-term practitioners of meditation who live in Nepal and India. They travel to Madison periodically to be hooked up to an assortment of high-technology equipment so that the electrical and hemodynamic (blood-

circulation) activity in their brains can be observed during meditative and non-meditative states. They have also collaborated with the scientists in the design of these experiments. Each expert has at least 10,000 hours of meditation practice, with some having as high as 50,000. In their tradition, they practice a type of Tibetan Buddhist meditation called "pure compassion" or "non-referential compassion" in which the intent is to generate a state of being that is permeated with compassion.

"My colleagues and I are especially interested," Dr. Davidson commented, "in practices that are explicitly designed to cultivate compassion voluntarily. This is a central message of the Dalai Lama," whom he

(continued on pg. 10)

Of Meditation, Monks, and Music

(continued from pg. 9)

cited as the inspiration and moving force behind this series of studies.

Dr. Davidson's first study of these practitioners, published in 2004, used EEG (electroencephalogram, a test that studies the brain's electrical activity through electrodes placed on the scalp) to observe as the meditators alternated

amplitude, synchronized oscillations in the [brain's] gamma-frequency range," Dr. Davidson said. "These shifts were very dramatic and pronounced, and are not entirely explained by muscle activity. This pattern of gamma-signal activity is seen [in people in general] during focused attention and other kinds of specific perceptual tasks. However, previously it was observed only for very short periods of time, less than 1 second. In these

to observe brain activity in an NCCAM-funded study of these long-term practitioners when they were presented, during meditation and rest states, with a series of emotional sounds. A control group was used that had learned a similar meditation technique and practiced it for 2 weeks before being tested. All participants were exposed to sounds that had either positive emotional content (a baby laughing), negative content

may change the brain and increase tendencies for compassion, kindness, and attentiveness to others, and also that longer training in meditation may lead to greater capacity for empathy.

Dr. Davidson's team is conducting another study, with NCCAM support, on whether neural responses (i.e., the responses of the nervous system) to stimuli with emotional content are affected by short-term use of compassion meditation. This study also includes a dimension looking at altruistic behavior. The results are currently being analyzed, but "our preliminary evidence suggests that even short-term training in meditation can change the brain," he said.

Other Effects From Meditation

Dr. Davidson's group has also studied meditation practitioners with regard to how their practice affects attention—a mental faculty important to processes such as mental focus, perception, memory, and consciousness—and the brain's circuitry involved.

An NCCAM-funded study by Dr. Davidson and his colleagues looked at the effects of meditation on a task challenging attention and on related brain activity. The type of meditation studied was concentration meditation, which may be described as focusing sustained attention on an object such as the breath or on a small visual stimulus. One group practiced this meditation as part of an intensive retreat, for



Richard Davidson (left) and Matthieu Ricard (right), following an MRI scan

between periods of meditation and a neutral state. They were compared with a control group that had no prior experience with meditation, but were taught a similar meditation technique that they practiced for 1 week.

As the long-term practitioners shifted from a neutral state to a meditative state, unlike the control group, they showed "a very sharp transition to prolonged periods of high-

practitioners, we saw it displayed for minutes.

"We also saw synchrony [coordination] between distant EEG sites," he continued. "The results suggest that this form of meditation induces strong connectivity among disparate brain circuits, and show what the brain is capable of doing during a voluntary mental task."

His team used a different tool, functional magnetic resonance imaging (fMRI),†

(a woman screaming in distress), or neutral content (background noise in a restaurant).

The investigators found that each participant, when exposed to the emotional sounds while meditating, had increased activity in several regions of the brain important in detecting feelings and emotions. However, the expert meditators showed much more of this type of activity than the novices, especially when they heard the negative sounds. The researchers concluded that this type of meditation

† With fMRI, researchers look at functioning in the brain or other organs by detecting changes in the chemical composition and/or blood flow in these areas.

3 months and 10 hours per day. They were compared with a control group that had just learned a similar technique and practiced it 20 minutes daily for 1 week. The task on which all participants were tested, before and after their meditation experiences, challenged attention and memory using a rapid series of letters and numbers. All participants improved on this task following meditation, the investigators found. The longer term practitioners, however, improved much more and also showed more efficient use of brain resources important to the task.

Ancient Practices, Future Possibilities

Dr. Davidson sees potential effects for meditation not only for individuals and their health but at a more global level as well: “The growing body of evidence on compassion, loving kindness, attention, and other related characteristics; on mental training that could enhance them; and on the effects of such training on the brain and body, all provide a scientific underpinning for the contemplative practices of many of the great classical meditation traditions,” he said. “This development could also lead to a more widespread incorporation of these practices into society, including social institutions.”

To see many recently published NCCAM-funded studies on meditation, go to www.ncbi.nlm.nih.gov/pubmed/ and enter “meditation AND nccam [gr]” in the search box.

An Interview With Richard J. Davidson, Ph.D.

As you consider the scientific evidence on happiness, do you think American society is largely on track or off track in terms of its pursuit?

In my own view, we’re largely off track, as a culture. The scientific research suggests that people are quite poor at predicting what will make them happy. People often believe that material things—the new car, the new home—will have a lasting effect on their happiness, but the evidence suggests they don’t. I think we have not done a great job in fostering a deeper understanding of what will produce more sustained increases in happiness, which, in my view, will not come from a change in external conditions, at least within the majority of our culture. That is not to say that people who are living in abject poverty, who can’t get adequate nutrition, won’t see a direct impact on happiness from a change in external conditions.... I think that the most important lesson I’ve gleaned about happiness is that it is best regarded as a skill that can be enhanced and trained.

If people feel intimidated by the prospect of learning meditation, or too busy, or unsure which of the many types to choose, do you have any suggestions?

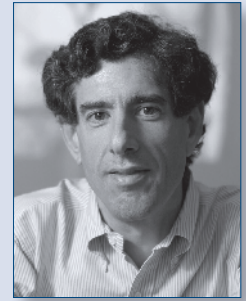
Some people are intimidated by the number of hours of practice of some of our long-term practitioners. However, preliminary findings from our lab indicate that as little as 2 weeks of meditation practice can produce reliable changes in measures of both brain and behavior. With regard to finding time, I would use an analogy. Many people believe that exercise is beneficial to their health, and they make time for it in their weekly routine. I think if we can be convinced that **mental** exercise,

of the kind that meditation represents, is as important to our health as physical exercise, people would create the time. Even 15 minutes per day of meditation is helpful. You can sleep 15 minutes less! But, I have found that most people can find the time elsewhere.

As for “which type,” I think that that’s a very difficult problem and an area in which scientific research is critically needed. I think it is best to not think of meditation as “one size fits all.” I suggest that people find a group or teacher whom they believe is honest and ethical and with whom they feel some kind of rapport. I also suggest that they practice the technique regularly for 3 months minimum before they decide whether it’s for them. Then they can either try to continue it, or try another approach.

Do you have an interest in how any specific population groups might benefit from meditative practices?

My interest is wide ranging in the application of meditation to physical and psychiatric disorders and to many different age groups. For example, I am leading a group studying its application to kids in the K-12 years—especially the middle school years, the pre- to early adolescent period. We know that that’s a time of huge increase in all kinds of disorders that occur during adolescence. If a kid is going to make a wrong turn, it’s often at that time, and it can have devastating consequences. If we can help children, through meditation, to stay on track and minimize bad choices, it would be a great contribution. ❖



Richard J. Davidson, Ph.D.

Jeff Miller, University of Wisconsin-Madison

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 **Calendar of Events**

This calendar lists CAM-related events in which NCCAM or other components of NIH are sponsors or participants. It includes information available at press time and Web sites for further information.

October 2008

Building the NIH Toolbox: Research in Cognition, Sensation, Emotion and Motor Function: October 27. *Location:* Bethesda, Maryland; www.nihtoolbox.org

December 2008

NIH Summit: The Science of Eliminating Health Disparities: December 16-18. *Location:* National Harbor, Maryland; www.ncmhd.nih.gov

February 2009

Meeting of the National Advisory Council for Complementary and Alternative Medicine: February 6. *Location:* Neuroscience Center Building, 6001 Executive Blvd., Rockville, Maryland; nccam.nih.gov/about/advisory/naccam/

May 2009

North American Research Conference on Complementary and Integrative Medicine: Collaboration to Promote Scientific Discovery and Health: May 12-16. *Location:* Minneapolis; www.imconsortium-conference.org/

More Information

The following **new NCCAM publications** are available on the Web and from the NCCAM Clearinghouse: *Herbs at a Glance: A Quick Guide to Herbal Supplements* and *CAM and Diabetes: A Focus on Dietary Supplements*.

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The **"NCCAM Grantsmanship Workshop"** held June 3-5, 2008, is available for viewing on the Internet at nccam.nih.gov/news/2007/110707.htm.

