

Osteoarthritis and Its Treatment: What You Need to Know

This booklet is based on a paper written for ACSH by

Gary W. Williams, M.D., Ph.D.

Chairman, Department of Medicine

Scripps Clinic Medical Group

*Vice President for Medicine Services
and Academic Affairs*

the Scripps Clinic Foundation, La Jolla, CA

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AMERICAN COUNCIL ON SCIENCE AND HEALTH

1995 Broadway, 2nd Floor, New York, NY 10023-5860

Phone: (212) 362-7044 • Fax: (212) 362-4919

URLs: <http://www.acsh.org> • <http://www.HealthFactsAndFears.com>

E-mail: acsh@acsh.org

KATHLEEN MEISTER, M.S., WROTE THIS BOOKLET, BASED ON AN EARLIER PAPER WRITTEN FOR ACSH BY GARY W. WILLIAMS, M.D., PH.D., WHICH WAS REVIEWED BY:

Steven Abramson, M.D.
*NYU School of Medicine
Hospital for Joint Diseases*

Karl E. Anderson, M.D., FACP
*University of Texas Medical
Branch*

Peter Barland, M.D.
*Albert Einstein College of
Medicine*

George E. Ehrlich, M.D.
*University of Pennsylvania/
NYU/WHO*

Allan Gibofsky, M.D., J.D., FACP,
FCLM
*Joan and Sanford Weill Medical
College of Cornell University*

Michael Kirsch, M.D., FACP
Highland Heights, OH

Joseph Markenson, M.D.
*Joan and Sanford Weill Medical
College of Cornell University*

Roland W. Moskowitz, M.D.
*Case Western Reserve University
School of Medicine*

Dennis L. Sprecher, M.D.
Cleveland Clinic Foundation

William B. White, M.D., FACP
*University of Connecticut School
of Medicine*

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Arthritis and other “rheumatic” (joint-related) conditions are the leading cause of disability in the United States. Between one sixth and one third of American adults — that is, somewhere between 40 and 70 million people — have some type of arthritis or chronic joint problem.¹ The most common type of arthritis is osteoarthritis; more than 20 million Americans have this condition.²

At the present time, osteoarthritis cannot be cured. However, much can be done to control its symptoms and maintain joint function. This report from the American Council on Science and Health provides a brief summary of the symptoms and causes of osteoarthritis and explains experts’ current views on the best ways to treat this disease.

Osteoarthritis Basics

The word *arthritis* literally means joint inflammation. In practice, the word is used to refer to a group of more than 100 diseases and conditions³ that can cause pain, stiffness, and swelling in the joints, including some conditions — such as osteoarthritis — in which inflammation is not necessarily apparent.

The word *osteoarthritis* refers to a group of disorders that affect the cartilage of the joints. Cartilage is the slippery tissue that covers the ends of the bones in a joint. When cartilage is healthy, it allows bones to glide over one another easily. It works as a shock absorber, helping to cushion the joint against damage from physical movement. When cartilage breaks down and wears away, however, as it does in osteoarthritis, the joint does not function well. The bones rub against each other directly, causing pain, swelling, stiffness, and difficulty in movement. Over time, the joint may lose its normal shape, bits of bone (bone spurs) may grow on the edges of the joint, and small pieces of bone or cartilage may break off and float inside the joint. All of these changes contribute to additional pain, loss of function, and joint damage.

¹ CDC Press Release, “Arthritis and Chronic Joint Conditions More Common Than Previously Thought,” 10/24/02.

² NIAMS fact sheet, “Handout on Health: Osteoarthritis” (referred to later as NIAMS 2002).

³ Lewis, C, Arthritis: timely treatments for an ageless disease, FDA Consumer, May-June 2000 (referred to later as FDA Consumer 2000).

Like other tissues in the body, cartilage is continually remade. Every day, some cartilage is broken down, and some new cartilage is formed. In osteoarthritis, there is an imbalance between the formation and breakdown of cartilage, so that the synthesis of new cartilage does not keep up with the wearing away of old cartilage. This is why the amount of cartilage in the joint decreases and the functioning of the joint becomes impaired.

Scientists have learned that the process by which cartilage deteriorates in osteoarthritis is very complex, involving multiple steps and the actions of many different body chemicals. Although this complexity makes the process difficult to understand, it also offers hope for the development of more effective treatments; drugs that inhibit any stage in the destructive process might be useful in relieving symptoms or slowing the progress of joint damage.

The joints most often affected by osteoarthritis are in the hands, knees, hips, and spine.⁴ The problem usually develops gradually; joint pain is the first symptom, and the pain is made worse by repetitive use of the joint.⁵ Some people have osteoarthritis in only one joint; in other individuals, many joints may be affected.

Older people are most at risk for osteoarthritis. The joints in the human body are under a great deal of stress, and cartilage has only a limited ability to repair itself. Thus, as people get older, the accumulation of many years of wear and tear on the joints increases the chances that osteoarthritis will develop. Aging is also associated with decreases in muscle mass and strength and with changes in bone, which may put additional stress on the cartilage of the joints.

Age is not the only risk factor for osteoarthritis, however. The disease can occur even in young people as a result of injury to a joint — generally from repeated trauma from recreational or other activities. Obesity is a major contributing factor in osteoarthritis of the knee, especially in women. Genetic factors are also believed to play a role. Osteoarthritis runs in some families. In addition, some people have hereditary conditions, such as hemochromatosis (an inherited disorder in which excessive amounts of iron accumulate in the body) that predispose them to osteoarthritis.

⁴ NIAMS 2002.

⁵ FDA Consumer 2000.

How Doctors Diagnose Osteoarthritis

When patients go to a doctor because of concern about joint pain or other joint symptoms, the doctor will need to determine whether the problem is due to osteoarthritis or to other causes. Many different conditions can cause joint pain; because these conditions require different types of treatment, it is important to distinguish among them.

There is no specific diagnostic test for osteoarthritis, but the physician can usually diagnose the problem through a physical examination and medical history (asking the patient about the symptoms and when they occur). X-rays are often taken. In some instances, particularly in patients who have inflammation (swelling of or fluid in the joint, and/or redness, and/or heat) along with joint pain and stiffness, blood tests or other diagnostic tests may be needed to distinguish osteoarthritis from other diseases such as rheumatoid arthritis. In patients with osteoarthritis, the results of the tests will be normal; in those with other diseases, they may not be.

Self-Treatment of Osteoarthritis

Most of the rest of this report will discuss the ways in which doctors treat osteoarthritis. It's important to note, though, that before patients see a doctor, they have usually been aware of their joint problems for some time and have taken steps to deal with the symptoms by using nonprescription medicines, devices, and/or dietary supplements. Many patients do not discuss their joint problems with a doctor until they reach the point where nonprescription remedies no longer relieve their symptoms.

Although self-treatment can be an appropriate way to deal with minor, occasional health problems, it is important for patients to realize that remedies available without a prescription are not necessarily risk-free. Also, people who use nonprescription products to treat joint symptoms may be delaying obtaining a correct diagnosis and thus appropriate medical care — joint pain may be caused by a number of illnesses other than arthritis — so an accurate diagnosis is important.

Those who decide to continue self-medicating should take the following precautions:

1. Always read and follow the directions on the product label.
2. If you take prescription medication or have any type of medical problem (even something unrelated to arthritis), consult your doctor before using any over-the-counter drug or dietary supplement. Some products sold without a prescription may not be safe for you or may interfere with your medications. For example, recent research indicates that ibuprofen (sold under many brand names including Advil and Motrin), which is commonly used to relieve mild arthritis pain and is available over the counter, may interfere with the protective effect of low-dose aspirin against heart attacks.
3. Be aware that, unlike over-the-counter drugs, dietary supplements do not need to be proven safe or effective before they can be sold. Many of these products have received little formal scientific scrutiny, and their risks and benefits may be uncertain. Dietary supplements may also be inconsistent in quality and purity.
4. If you need to treat yourself for joint symptoms frequently, it would be a good idea to consult your doctor even if you are still obtaining satisfactory results from nonprescription remedies. Your doctor may be able to recommend or prescribe treatments that are safer or more effective than those that you have been using on your own.

Forms of Treatment for Osteoarthritis

The currently available forms of treatment for arthritis do not cure or modify the course of the disease. Instead, the goal of therapy is to control pain and maintain or improve joint function.

Two professional organizations, the American College of Rheumatology (the organization of U.S. physicians who specialize in arthritis care) and the American Pain Society (an organization of scientists and physicians specializing in research on and treatment of pain), have issued treatment guidelines for osteoarthritis. The goal of these guidelines is to ensure that the safest treatments are used first, with forms of therapy that are most likely to produce troublesome side effects reserved for cases in which the preferred treatments did not produce adequate relief of symptoms.

Both sets of guidelines begin by recommending non-drug therapies,

such as weight loss (particularly valuable for patients with osteoarthritis of the knee) and appropriate exercises to strengthen muscles. These forms of treatment are safe when performed properly, and they may allow patients with mild or intermittent joint symptoms to avoid the use of drugs (and therefore the potential side effects of drug therapy).

Drug Therapy

If non-drug therapies don't produce sufficient relief, the use of drugs is the next step in osteoarthritis therapy. For patients with mild joint pain, the first drug recommended in both sets of guidelines is acetaminophen (the active ingredient in Tylenol and many other brands of non-aspirin pain reliever). The advantages of this drug include its relatively low cost, widespread over-the-counter availability, and general safety. For patients whose arthritis pain is too severe to be relieved by acetaminophen, the recommendations are more complex. To understand the reasoning behind them, it is helpful to take a brief look at the types of drugs used to treat osteoarthritis and how they work.

The drugs most commonly used to treat osteoarthritis are non-steroidal anti-inflammatory drugs (NSAIDs). These drugs work in the body by inhibiting the actions of enzymes called cyclooxygenases (COX), which contribute to pain and inflammation. There are at least two kinds of COX enzymes in the body: COX-1 and COX-2. Research indicates that the COX-2 enzyme is the one that's important in causing pain and inflammation. COX-1 is more of a "housekeeping" enzyme; it plays roles in the normal functioning of several body organs and, in particular, seems to have a protective role in the digestive tract.

Traditional NSAIDs, such as ibuprofen (Advil, Motrin, etc.), naproxen (Anaprox, Aleve, Naprosyn), ketoprofen (Orudis, Oruvail), and indomethacin (Indocin), inhibit both COX-1 and COX-2. These drugs are effective against pain and inflammation, but they also tend to have side effects in the digestive tract, especially when they're used on a regular basis, as they often are by patients with osteoarthritis. The side effects sometimes include serious problems, such as ulcers and bleeding.

Some newer drugs, called COX-2-selective agents, are also used in the treatment of osteoarthritis. This group of drugs includes celecoxib (Celebrex), rofecoxib (Vioxx), and valdecoxib (Bextra). These drugs are NSAIDs, but they inhibit COX-2 only; they don't affect COX-1. Research has indicated that they work as well as the traditional

nonselective NSAIDs do in reducing pain and inflammation. Apparently, COX-2 is the important enzyme when it comes to pain; whether or not a drug inhibits COX-1 seems to be irrelevant in terms of the drug's effectiveness against arthritis pain.

The COX-2–selective agents have fewer gastrointestinal side effects than do traditional nonselective NSAIDs, suggesting that the side effects of the traditional drugs are due primarily to their impact on COX-1. COX-2–selective agents are not entirely free from side effects (no drug is), but they do have a safety advantage over traditional nonselective NSAIDs in terms of their most common adverse effect, bleeding in the stomach and related areas. The lower risk of stomach effects is not absolute. These drugs should also be used with caution in those who have had any episode of internal bleeding. Kidney and liver damage can also be made worse by COX-2–selective drugs.

One recently-approved COX-2–selective agent, rofecoxib, was found in one large study to have a negative effect on the risk of heart attack, especially in those using a higher dose. Thus, practitioners have been advised by the FDA to bear this in mind before prescribing this agent to patients with cardiovascular disease.

Because COX-2–selective agents work as well as traditional nonselective NSAIDs do but produce fewer troublesome side effects, both sets of official guidelines recommend the COX-2–selective agents as the preferred drugs for patients who need something stronger than acetaminophen to treat their osteoarthritis. When expense is not an issue — the newer COX-2 selective agents are more expensive — traditional nonselective NSAIDs should be used only if the newer agents are not effective. In that instance, patients who are judged to be at risk for digestive tract problems may need to take an additional drug to protect the stomach and GI tract along with the traditional nonselective NSAID to reduce the risk of these problems.

It should also be noted that those patients taking aspirin to protect themselves against heart disease must continue to take it if they are also prescribed any of the NSAIDs discussed here, since none of the anti-arthritis drugs (COX-2 selective or not) offer that same protection. While taking both aspirin and a NSAID the risk of stomach or other internal bleeding is increased — thus, it is most important that the patient's doctor be informed if this is the case.

Other Drugs and Therapies

In addition to the drugs discussed above, several other forms of therapy are sometimes used in patients with osteoarthritis. These include:

- **Topical agents** — A few creams, rubs, or sprays that are applied directly to the skin may be helpful in relieving mild pain due to osteoarthritis. However, these should be discussed thoroughly with your doctor as there are many so-called “alternative” remedies that come in these forms and are of no value whatsoever.
- **Hyaluronates** — This is a substance that can be injected into an arthritic joint. It has a lubricating effect and may have other beneficial effects as well. It is usually used to treat osteoarthritis of the knee, and it may work well enough to allow patients to discontinue oral medication for a period of time.
- **Corticosteroids** — This is another type of medication that may be injected into an arthritic joint. Corticosteroids take effect more quickly and cost less than hyaluronic acid does, but there has been some controversy about possible harmful effects if they are used too often.
- **Narcotics or a non-narcotic pain reliever called tramadol (Ultram)** — These strong pain relievers may be used to relieve osteoarthritis pain when other drugs fail, but they are considered only a last resort because they pose a serious risk of becoming habit-forming.⁶ As a rule, narcotic drugs should only be used in the short period while surgery is being contemplated.
- **Surgery** — When other measures fail, joint replacement surgery is often performed in patients with advanced osteoarthritis. Since the first such procedures were performed around 40 years ago, the techniques have improved to such a degree that the large majority of patients who undergo joint replacement surgery are largely relieved of pain while experiencing improved function and mobility.

Glucosamine and Chondroitin

Two dietary supplements usually used in combination, glucosamine sulfate and chondroitin sulfate, are probably the most widely used alterna-

⁶ NIAMS 2002.

tive therapy for osteoarthritis. Glucosamine and chondroitin are important constituents of cartilage, and the basis for their use is the hope that taking them as dietary supplements might help to replenish and restore cartilage.

The results of several scientific studies suggest that glucosamine may indeed be helpful in relieving symptoms of osteoarthritis. This agent seems to work better than inactive placebos do, and may even produce results as good as those seen with NSAIDs in some patients. However, it is important to remember that glucosamine is a “dietary supplement,” not an FDA-approved drug, and therefore is not subject to the stringent safety, efficacy, and quality standards applied to drugs. Further scientific study of glucosamine (and chondroitin) is needed. Patients with osteoarthritis who plan to try these products should tell their doctors that they intend to do so. As with all drugs and dietary supplements, side effects and interactions with other agents are possible, so it is important for the physician to be aware of all substances that the patient is using.

Future Drug Therapies for Osteoarthritis

At the present time, drugs that actually modify the course of osteoarthritis are not available. However, efforts are being made to develop drugs of this type. It seems reasonable to assume that such drugs can be developed; in fact, disease-modifying drugs have long existed for another major form of arthritis, rheumatoid arthritis. If drugs that modify the course of osteoarthritis come onto the market, they might drastically alter the treatment of this disease, making joint preservation, rather than symptom control, the principal goal of therapy.

Summary

Osteoarthritis, a type of arthritis caused by breakdown of cartilage in the joints, is a very common medical problem, affecting more than 20 million Americans. The joints most often affected are the hands, knees, hips, and spine. Older people are most at risk, but even young people can develop osteoarthritis as a result of joint injury. The disease is usually diagnosed on the basis of the patient’s symptoms and medical history; no specific diagnostic test exists, although X-rays are often highly suggestive, but various tests may be conducted to rule out other diseases of the joints.

It is common for people with mild or occasional joint symptoms to treat themselves using nonprescription remedies. While this is not necessarily inappropriate, ACSH urges people with persistent or frequent joint problems to consult a physician. People who take prescription medication or have any type of medical problem should consult a doctor before using any over-the-counter drug or dietary supplement to treat joint symptoms.

Two major professional organizations, the American College of Rheumatology and the American Pain Society, have issued treatment guidelines for osteoarthritis. These guidelines state that:

1. Non-drug therapies such as exercise and weight loss should be tried first.
2. Acetaminophen is recommended as a first-choice drug for mild joint pain.
3. For moderate or severe joint pain, the COX-2-selective agents are the first-choice drugs. The effectiveness of these drugs is comparable to that of traditional nonselective NSAIDs, but the COX-2-selective agents have the advantage of a lower risk of gastrointestinal side effects. In addition, they may also be less likely to interfere with the protective effect of aspirin against heart attacks.
4. COX-2-selective agents are expensive, however.
5. In instances in which COX-2-selective agents do not produce sufficient relief of symptoms, traditional nonselective NSAIDs may be used, but patients should be evaluated for the risk of digestive tract side effects, and additional medications to reduce the risk of such side effects may be needed.
6. Other forms of therapy that may be used in selected cases include topical agents, hyaluronic acid joint injections, glucosamine, corticosteroid joint injections, narcotic pain relievers, tramadol, and surgery.
7. The treatments currently available only relieve symptoms of osteoarthritis without modifying the course of the disease. However, efforts are currently being made to develop disease-modifying drugs.

Robert M. Hollingworth, Ph.D. <i>Michigan State University</i>	Brian A. Larkins, Ph.D. <i>University of Arizona</i>	Ian C. Munro, F.A.T.S., Ph.D., FRCPPath <i>Cantox Health Sciences International</i>	Bill D. Reebuck, Ph.D., D.A.B.T. <i>Dartmouth Medical School</i>	Judith S. Stern, Sc.D., R.D. <i>University of California, Davis</i>
Edward S. Horton, M.D. <i>Joslin Diabetes Center</i>	Larry Laudan, Ph.D. <i>National Autonomous University of Mexico</i>	Kevin B. Murphy <i>Merrill Lynch, Pierce, Fenner & Smith</i>	David B. Roll, Ph.D. <i>University of Utah</i>	Ronald D. Stewart, O.C., M.D., FRCP <i>Dalhousie University</i>
Joseph H. Hotchkiss, Ph.D. <i>Cornell University</i>	Tom B. Leamon, Ph.D. <i>Liberty Mutual Insurance Company</i>	Harris M. Nagler, M.D. <i>Beth Israel Medical Center</i>	Dale R. Romsos, Ph.D. <i>Michigan State University</i>	Martha Barnes Stone, Ph.D. <i>Colorado State University</i>
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Susanne L. Huttner, Ph.D. <i>University of California, Berkeley</i>	Brian C. Lentle, M.D., FRCP, DMRD <i>University of British Columbia</i>	Philip E. Nelson, Ph.D. <i>Purdue University</i>	Steven T. Rosens, M.D. <i>Northwestern University Medical School</i>	Michael M. Sveda, Ph.D. <i>Gaithersburg, MD</i>
Robert H. Imrie, D.V.M. <i>Seattle, WA</i>	Floy Lilley, J.D. <i>Amelia Island, FL</i>	Malden C. Nesheim, Ph.D. <i>Cornell University</i>	Kenneth J. Rothman, Dr.P.H. <i>Cornell University</i>	Glenn Swogger, Jr., M.D. <i>Topeka, KS</i>
Lucien R. Jacobs, M.D. <i>University of California, Los Angeles</i>	Paul J. Liou, Ph.D. <i>UMDNJ-Robert Wood Johnson Medical School</i>	Joyce A. Nettleton, D.Sc., R.D. <i>Aurora, Co</i>	Stanley Rothman, Ph.D. <i>Smith College</i>	Sita R. Tatin, Ph.D. <i>University of Minnesota</i>
Alejandro R. Jadad, M.D., D.Phil., F.R.C.P.C. <i>University of Toronto, Canada</i>	William M. London, Ed.D., M.P.H. <i>Walden University</i>	John S. Neuberger, Dr.P.H. <i>University of Kansas School of Medicine</i>	Edward C. A. Runge, Ph.D. <i>Texas A&M University</i>	Steve L. Taylor, Ph.D. <i>University of Nebraska, Lincoln</i>
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P. Andrew Karam, Ph.D., CHP <i>University of Rochester</i>	Howard D. Maccabee, Ph.D., M.D. <i>Radiation Oncology Center</i>	Deborah L. O'Connor, Ph.D. <i>University of Toronto/The Hospital for Sick Children</i>	Herbert P. Sarett, Ph.D. <i>Sarasota, FL</i>	Mark J. Utell, M.D. <i>University of Rochester Medical Center</i>
Philip G. Keeney, Ph.D. <i>Pennsylvania State University</i>	Janet E. Macheleddt, M.D., M.S., M.P.H. <i>Houston, TX</i>	John Patrick O'Grady, M.D. <i>Tufts University School of Medicine</i>	Sally L. Satal, M.D. <i>American Enterprise Institute</i>	Shashi B. Verma, Ph.D. <i>University of Nebraska, Lincoln</i>
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Kathryn E. Kelly, Dr.PH. <i>Delta Toxicology</i>	Henry G. Manne, J.S.D. <i>George Mason University Law School</i>	Stanley T. Omaye, Ph.D., F-A.T.S., FACN, C.N.S. <i>University of Nevada, Reno</i>	Jeffrey Wyatt Savell <i>Texas A&M University</i>	Donald M. Watkin, M.D., M.P.H., F.A.C.P. <i>George Washington University</i>
George R. Kerr, M.D. <i>University of Texas, Houston</i>	Karl Maramorosch, Ph.D. <i>Rutgers University, Cook College</i>	Michael T. Osterholm, Ph.D., M.P.H. <i>University of Minnesota</i>	Marvin J. Schissel, D.D.S. <i>Roslyn Heights, NY</i>	Miles Weinberger, M.D. <i>University of Iowa Hospitals and Clinics</i>
George A. Keyworth II, Ph.D. <i>Progress and Freedom Foundation</i>	Judith A. Marlett, Ph.D., R.D. <i>University of Wisconsin, Madison</i>	M. Alice Ottoboni, Ph.D. <i>Sparks, NV</i>	Lawrence J. Schneiderman, M.D. <i>University of California, San Diego</i>	Lynn Waitswell, Ph.D., CHES <i>University of Medicine and Dentistry of New Jersey</i>
Michael Kirsch, M.D. <i>Highland Heights, OH</i>	James R. Marshall, Ph.D. <i>Roswell Park Cancer Institute</i>	Michael W. Pariza, Ph.D. <i>University of Wisconsin, Madison</i>	Edgar J. Schoen, M.D. <i>Kaiser Permanente Medical Center</i>	Janet S. Weiss, M.D. <i>University of California at San Francisco</i>
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Ronald E. Kleinman, M.D. <i>Massachusetts General Hospital</i>	Mary H. McGrath, M.D., M.P.H. <i>Loyola University Medical Center</i>	James Marc Perrin, M.D. <i>Mass General Hospital for Children</i>	Joel M. Schwartz, M.S. <i>Rosen Public Policy Institute</i>	Steven D. Wexner, M.D. <i>Cleveland Clinic Florida</i>
Leslie M. Klevay, M.D., S.D.in Hyg. <i>University of North Dakota School of Medicine</i>	Alan G. McHughen, D.Phil. <i>University of California, Riverside</i>	Timothy Dukes Phillips, Ph.D. <i>Texas A&M University</i>	David E. Seidemann, Ph.D. <i>Brooklyn College/Yale University</i>	Joel Elliot White, M.D., F.A.C.R. <i>John Muir Comprehensive Cancer Center</i>
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James S. Koopman, M.D., M.P.H. <i>University of Michigan</i>	Donald J. McNamara, Ph.D. <i>Egg Nutrition Center</i>	Thomas T. Poleman, Ph.D. <i>Cornell University</i>	Sidney Shindell, M.D., LL.B. <i>University of Wisconsin</i>	Mark L. Willenbring, M.D. <i>Veterans Affairs Medical Center</i>
Alan R. Kristal, Dr.PH. <i>Fred Hutchinson Cancer Research Center</i>	Michael H. Merson, M.D. <i>University School of Medicine</i>	Charles Poole, M.P.H., Sc.D <i>University of North Carolina School of Public Health</i>	Sarah Short, Ph.D., Ed.D., R.D. <i>Syracuse University</i>	Carl K. Winter, Ph.D. <i>University of California, Davis</i>
David Kritchevsky, Ph.D. <i>The Wistar Institute</i>	Patrick J. Michaels, Ph.D. <i>University of Virginia</i>	Stuart Patton, Ph.D. <i>University of California, San Diego</i>	A. J. Siedler, Ph.D. <i>University of Illinois, Urbana-Champaign</i>	Lloyd D. Witter, Ph.D. <i>University of Illinois, Urbana-Champaign</i>
Stephen B. Kritchevsky, Ph.D. <i>Wake Forest University Health Sciences</i>	Thomas H. Milby, M.D., M.P.H. <i>Walnut Creek, CA</i>	James Marc Perrin, M.D. <i>Mass General Hospital for Children</i>	Lee M. Silver, Ph.D. <i>Princeton University</i>	James J. Workman, Ph.D. <i>Rochester Institute of Technology</i>
Mitzi R. Krocovker, M.D. <i>Humana, Inc.</i>	Joseph M. Miller, M.D., M.P.H. <i>University of New Hampshire</i>	Timothy Dukes Phillips, Ph.D. <i>Texas A&M University</i>	Michael S. Simon, M.D., M.P.H. <i>Wayne State University</i>	Russell S. Worrall, O.D. <i>University of California, Berkeley</i>
Manfred Kroger, Ph.D. <i>Pennsylvania State University</i>	William J. Miller, Ph.D. <i>University of Georgia</i>	Mary Frances Picciano, Ph.D. <i>National Institutes of Health</i>	S. Fred Singer, Ph.D. <i>Science & Environmental Policy Project</i>	Panayiotis M. Zavas, Ph.D., Ed.S. <i>University of Kentucky</i>
Laurence J. Kulp, Ph.D. <i>University of Washington</i>	Dade W. Moeller, Ph.D. <i>Harvard University</i>	David R. Pike, Ph.D. <i>University of Illinois, Urbana-Champaign</i>	Robert B. Sklaroff, M.D. <i>Elkins Park, PA</i>	Steven H. Zeisel, M.D., Ph.D. <i>The Ohio State University</i>
Sandford F. Kuvin, M.D. <i>University of Miami</i>	Grace P. Monaco, J.D. <i>Medical Care Management Corp.</i>	Thomas T. Poleman, Ph.D. <i>Cornell University</i>	Anne M. Smith, Ph.D., R.D., L.D. <i>The Ohio State University</i>	Michael B. Zemel, Ph.D. <i>Nutrition Institute, University of Tennessee</i>
Carolyn J. Lackey, Ph.D., R.D. <i>North Carolina State University</i>	Brian E. Mondell, M.D. <i>Baltimore Headache Institute</i>	Charles Poole, M.P.H., Sc.D <i>University of North Carolina School of Public Health</i>	Gary C. Smith, Ph.D. <i>Colorado State University</i>	Eckhard E. Ziegler, M.D. <i>University of Iowa</i>
Pagona Lagiou, M.D., DrMedSci <i>University of Athens Medical School</i>	Eric W. Mood, LL.D., M.P.H. <i>Yale University School of Medicine</i>	Gary P. Posner, M.D. <i>Tampa, FL</i>	John N. Sofos, Ph.D. <i>Colorado State University</i>	
J. Clayburn LaForce, Ph.D. <i>University of California, Los Angeles</i>	John W. Morgan, Dr.PH. <i>California Cancer Registry</i>	John J. Powers, Ph.D. <i>University of Georgia</i>	Roy F. Spalding, Ph.D. <i>University of Nebraska, Lincoln</i>	
James C. Lamb, IV, Ph.D., J.D. <i>Blastland, Bouck & Lee</i>	W. K. C. Morgan, M.D. <i>University of Western Ontario</i>	William D. Powrie, Ph.D. <i>University of British Columbia</i>	Leonard T. Sperry, M.D., Ph.D. <i>Barry University</i>	
Lawrence E. Lamb, M.D. <i>San Antonio, TX</i>	Stephen J. Moss, D.D.S., M.S. <i>Health Education Enterprises, Inc.</i>	C.S. Prakash, Ph.D. <i>Tokegee University</i>	Robert A. Squire, D.V.M., Ph.D. <i>Johns Hopkins University</i>	
William E. M. Lands, Ph.D. <i>College Park, MD</i>	Brooke T. Mossman, Ph.D. <i>University of Vermont College of Medicine</i>	Grace P. Monaco, J.D. <i>Medical Care Management Corp.</i>	Ronald T. Stanko, M.D. <i>University of Pittsburgh Medical Center</i>	
Lillian Langseth, Dr.PH. <i>Lyda Associates, Inc.</i>	Allison A. Muller, Pharm.D <i>The Children's Hospital of Philadelphia</i>	Brian E. Mondell, M.D. <i>Baltimore Headache Institute</i>	James H. Steele, D.V.M., M.P.H. <i>University of Texas, Houston</i>	
		Marvin P. Pritts, Ph.D. <i>Cornell University</i>	Robert D. Steele, Ph.D. <i>Pennsylvania State University</i>	