Handout on Health: Osteoarthritis

May 2016

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This publication is for people who have osteoarthritis, their families, and others interested in learning more about the disorder. The publication describes osteoarthritis and its symptoms and contains information about diagnosis and treatment, as well as research efforts supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) and other components of the U.S. Department of Health and Human Services’ National Institutes of Health (NIH). It also discusses pain relief, exercise, and quality of life for people with osteoarthritis. At the end is a list of key words to help you understand the terms used in this publication. If you have further questions after reading this, you may wish to discuss them with your doctor.

What Is Osteoarthritis?

Osteoarthritis (AH-stee-oh-ar-THREYE-tis) is the most common type of arthritis and is seen especially among older people. Sometimes it is called degenerative joint disease. Osteoarthritis mostly affects cartilage (KAR-til-uj), the hard but slippery tissue that covers the ends of bones where they meet to form a joint. Healthy cartilage allows bones to glide over one another. It also absorbs energy from the shock of physical movement. In osteoarthritis, the surface layer of cartilage breaks and wears away. This allows bones under the cartilage to rub together, causing pain, swelling, and loss of motion of the joint. Over time, the joint may lose its normal shape. Also, small deposits of bone—called osteophytes or bone spurs—may grow on the edges of the joint. Bits of bone or cartilage can break off and float inside the joint space. This causes more pain and damage.

- Who Has Osteoarthritis?
People with osteoarthritis usually have joint pain and stiffness. Unlike some other forms of arthritis, such as rheumatoid arthritis, osteoarthritis affects only joint function. It does not affect skin tissue, the lungs, the eyes, or the blood vessels.

In rheumatoid arthritis, another common form of arthritis, the immune system attacks the tissues of the joints, leading to pain, inflammation, and eventually joint damage and malformation. It typically begins at a younger age than osteoarthritis, causes swelling and redness in joints, and may make people feel sick, tired, and feverish. Also, the joint involvement of rheumatoid arthritis is symmetrical; that is, if one joint is affected, the same joint on the opposite side of the body is usually similarly affected.

Osteoarthritis, on the other hand, can occur
in a single joint or can affect a joint on one side of the body much more severely.

Who Has Osteoarthritis?


Although osteoarthritis becomes more common with age, younger people can develop it, usually as the result of a joint injury, a joint malformation, or a genetic defect in joint cartilage. Both men and women have the disease. Before age 45, more men than women have osteoarthritis; after age 45, it is more common in women. It is also more likely to occur in people who are overweight and in those with jobs that stress particular joints.

How Does Osteoarthritis Affect People?

People with osteoarthritis usually experience joint pain and stiffness. The most commonly affected joints are those at the ends of the fingers (closest to the nail), thumbs, neck, lower back, knees, and hips.

Osteoarthritis affects different people differently. It may progress quickly, but for most people, joint damage develops gradually over years. In some people, osteoarthritis is relatively mild and interferes little with day-to-day life; in others, it causes significant pain and disability.

What Areas Does Osteoarthritis Affect?

[Handout on Health: Osteoarthritis](https://www.niams.nih.gov/Health_info/Osteoarthritis/default.asp)
Osteoarthritis most often occurs in the hands (at the ends of the fingers and thumbs), spine (neck and lower back), knees, and hips.

Osteoarthritis Basics: The Joint and Its Parts

A joint is the point where two or more bones are connected. With a few exceptions (in the skull and pelvis, for example), joints are designed to allow movement between the bones and to absorb shock from movements like walking or repetitive motions. These movable joints are made up of the following parts:

**Cartilage:** A hard but slippery coating on the end of each bone. Cartilage breaks down and wears away in osteoarthritis.

**Joint capsule:** A tough membrane sac that encloses all the bones and other joint parts.

**Synovium (sin-O-vee-um):** A thin membrane inside the joint capsule that secretes synovial fluid.

**Synovial fluid:** A fluid that lubricates the joint and keeps the cartilage smooth and healthy.

**Ligaments, tendons, and muscles:** Tissues that surround the bones and joints, and allow the joints to bend and move. Ligaments are
tough, cord-like tissues that connect one bone to another.

**Tendons**: Tough, fibrous cords that connect muscles to bones. Muscles are bundles of specialized cells that, when stimulated by nerves, either relax or contract to produce movement.

In a healthy joint, the ends of bones are encased in smooth cartilage. Together, they are protected by a joint capsule lined with a synovial membrane that produces synovial fluid. The capsule and fluid protect the cartilage, muscles, and connective tissues.

A Joint With Severe Osteoarthritis (Representation)
With osteoarthritis, the cartilage becomes worn away. Spurs grow out from the edge of the bone, and synovial fluid increases. Altogether, the joint feels stiff and sore.

How Do You Know if You Have Osteoarthritis?

Usually, osteoarthritis comes on slowly. Early in the disease, your joints may ache after physical work or exercise. Later on, joint pain may become more persistent. You may also experience joint stiffness, particularly when you first wake up in the morning or have been in one position for a long time.

Although osteoarthritis can occur in any joint, most often it affects the hands, knees, hips, and spine (either at the neck or lower back). Different characteristics of the disease can depend on the specific joint(s) affected. For information on the joints most often affected by osteoarthritis, see the following descriptions:

**Hands:** Osteoarthritis of the hands seems to have some hereditary characteristics; that is, it runs in families. If your mother or grandmother has or had osteoarthritis in their hands, you’re at greater-than-average risk of having it too. Women are more likely than men to have osteoarthritis in the hands. For most women, it develops after menopause.

**Knees:** The knees are among the joints most
commonly affected by osteoarthritis. Symptoms of knee osteoarthritis include stiffness, swelling, and pain, which make it hard to walk, climb, and get in and out of chairs and bathtubs. Osteoarthritis in the knees can lead to disability.

**Hips:** The hips are also common sites of osteoarthritis. As with knee osteoarthritis, symptoms of hip osteoarthritis include pain and stiffness of the joint itself. But sometimes pain is felt in the groin, inner thigh, buttocks, or even the knees. Osteoarthritis of the hip may limit moving and bending, making daily activities such as dressing and putting on shoes a challenge.

**Spine:** Osteoarthritis of the spine may show up as stiffness and pain in the neck or lower back. In some cases, arthritis-related changes in the spine can cause pressure on the nerves where they exit the spinal column, resulting in weakness, tingling, or numbness of the arms and legs. In severe cases, this can even affect bladder and bowel function.

**How Do Doctors Diagnose Osteoarthritis?**

No single test can diagnose osteoarthritis; however, sometimes doctors use tests to help confirm a diagnosis or rule out other conditions that could be causing your symptoms. Most doctors use a combination of the following methods:

**Clinical History**

The doctor begins by asking you to describe the symptoms, when and how the condition started, as well as how the symptoms have changed over time. The doctor will also ask about any other medical problems you and close family members have and about any medications you are taking.

**Physical Examination**

The doctor will check your reflexes and general health, including muscle strength. The doctor will also examine bothersome joints and observe your ability to walk, bend, and carry out activities of daily living.

**X Rays**

X rays can help doctors determine the form of arthritis a person has and how much joint damage has been done. X rays of the
affected joint can show such things as cartilage loss, bone damage, and bone spurs. But there often is a big difference between the severity of osteoarthritis as shown by the x-ray and the degree of pain and disability you feel. Also, x-rays may not show early osteoarthritis damage until much cartilage loss has taken place.

**Magnetic Resonance Imaging**

Also known as MRI, magnetic resonance imaging provides high-resolution computerized images of internal body tissues. This procedure uses a strong magnet that passes a force through the body to create these images. Doctors often use MRI tests if there is pain, if x-ray findings are minimal, and if the findings suggest damage to other joint tissues such as a ligament or the pad of connective tissue in the knee known as the meniscus.

**Other Tests**

The doctor may order blood tests to rule out other causes of symptoms. He or she may also order a joint aspiration, which involves drawing fluid from the joint through a needle and examining the fluid under a microscope. Joint fluid samples could reveal bacteria, indicating joint pain is caused by an infection or uric acid crystals, indicating gout.

Osteoarthritis is so common, especially in older people, that symptoms seemingly caused by the disease actually may be caused by other medical conditions. The doctor will try to find out what is causing the symptoms by ruling out other disorders and identifying conditions that may make the symptoms worse.

**How Is Osteoarthritis Treated?**

Most successful treatment programs involve a combination of approaches tailored to the patient’s needs, lifestyle, and health. Most programs include ways to manage pain and improve function. These approaches are described below.

**Four Goals of Osteoarthritis Treatment**

- to control pain
- to improve joint function
Exercise

Research shows that exercise is one of the best treatments for osteoarthritis. Exercise can improve mood and outlook, decrease pain, increase flexibility, strengthen the heart and improve blood flow, maintain weight, and promote general physical fitness. Exercise is also inexpensive and, if done correctly, has few negative side effects. The amount and form of exercise prescribed will depend on which joints are involved, how stable the joints are, and whether a joint replacement has already been done. Walking, swimming, and water aerobics are a few popular types of exercise for people with osteoarthritis. Your doctor and/or physical therapist can recommend specific types of exercise depending on your particular situation. Attention to rest and periods of relief from stress on the joints is also important.

On the Move: Fighting Osteoarthritis With Exercise

You can use exercises to keep strong and limber, improve cardiovascular fitness, extend your joints’ range of motion, and reduce your weight. The following types of exercise are part of a well-rounded arthritis treatment.
Plan.

- **Strengthening exercises**: These exercises strengthen muscles that support joints affected by arthritis. They can be performed with weights or with exercise bands, inexpensive devices that add resistance.

- **Aerobic activities**: These are exercises, such as brisk walking or low-impact aerobics, that get your heart pumping and can keep your lungs and circulatory system in shape.

- **Range-of-motion activities**: These keep your joints limber.

- **Balance and agility exercises**: These help you maintain daily living skills.

Ask your doctor or physical therapist what exercises are best for you. Ask for guidelines on exercising.

**Weight Control**

If you are overweight or obese, you should try to lose weight. Weight loss can reduce stress on weight-bearing joints, limit further injury, increase mobility, and reduce the risk of associated health problems. A dietitian can help you develop healthy eating habits. A healthy diet and regular exercise help reduce weight.

**Nondrug Pain Relief and Alternative Therapies**

People with osteoarthritis may find many nondrug ways to relieve pain. Below are some examples:

**Heat and cold**: Heat or cold (or a combination of the two) can be useful for joint pain. Heat can be applied in a number of different ways—with warm towels, hot packs,
or a warm bath or shower—to increase blood flow and ease pain and stiffness. In some cases, cold packs (bags of ice or frozen vegetables wrapped in a towel), which reduce inflammation, can relieve pain or numb the sore area. (Check with a doctor or physical therapist to find out if heat or cold is the best treatment.)

Transcutaneous electrical nerve stimulation (TENS): TENS is a technique that uses a small electronic device to direct mild electric pulses to nerve endings that lie beneath the skin in the painful area. TENS may relieve some arthritis pain. It seems to work by blocking pain messages to the brain and by modifying pain perception.

Massage: In this pain-relief approach, a massage therapist will lightly stroke and/or knead the painful muscles. This may increase blood flow and bring warmth to a stressed area. However, arthritis-stressed joints are sensitive, so the therapist must be familiar with the problems of the disease.

Acupuncture: When conventional medical treatment doesn’t provide sufficient pain relief, people are more likely to try complementary and alternative therapies to treat osteoarthritis. Some people have found pain relief using acupuncture, a practice in which fine needles are inserted by a licensed acupuncture therapist at specific points on the skin. Scientists think the needles stimulate the release of natural, pain-relieving chemicals produced by the nervous system.

Nutritional supplements: Nutritional supplements such as glucosamine and chondroitin sulfate have been reported to improve symptoms in some people with osteoarthritis, as have certain vitamins. Additional studies have been carried out to further evaluate these claims (see “Research Highlights”). It is unknown whether they might change the course of disease.

Medications to Control Pain

Doctors prescribe medicines to eliminate or reduce pain and to improve functioning. Doctors consider a number of factors when choosing medicines for their patients with osteoarthritis. These include the intensity of pain, potential side effects of the medication, your medical history (other health problems you have or are at risk for), and other
medications you are taking.

Because some medications can interact with one another and certain health conditions put you at increased risk of drug side effects, it's important to discuss your medication and health history with your doctor before you start taking any new medication, and to see your doctor regularly while you are taking medication. By working together, you and your doctor can find the medication that best relieves your pain with the least risk of side effects.

The following types of medicines are commonly used in treating osteoarthritis:

2 All medicines can have side effects. Some side effects may be more severe than others. You should review the package insert that comes with your medicine and ask your health care provider or pharmacist if you have any questions about the possible side effects.

Over-the-counter pain relievers: Oral pain medications, such as acetaminophen, are often a first-line approach to relieve pain in people with osteoarthritis.

NSAIDs (nonsteroidal anti-inflammatory drugs): A large class of medications useful against both pain and inflammation, (NSAIDs) are a common arthritis treatment. Aspirin and ibuprofen are examples of NSAIDs.

3 Warning: Side effects of NSAIDs include stomach problems; skin rashes; high blood pressure; fluid retention; and liver, kidney, and heart problems. The longer a person uses NSAIDs, the more likely he or she is to have side effects, ranging from mild to serious. Many other drugs cannot be taken when a patient is being treated with NSAIDs, because NSAIDs alter the way the body uses or eliminates these other drugs. Check with your health care provider or pharmacist before you take NSAIDs. NSAIDs should only be used at the lowest dose possible for the shortest time needed.

Some NSAIDs are available over the counter, while more than a dozen others, including a subclass called COX-2 inhibitors, are available only with a prescription.

Narcotic or central acting agents:
Prescription pain relievers are sometimes prescribed when over-the-counter medications don't provide sufficient relief or when people have certain medical problems that would make traditional NSAIDs or other first-line therapies unsafe. These medications can carry risks, including the potential for addiction.

**Corticosteroids**: Corticosteroids are powerful anti-inflammatory hormones made naturally in the body or man-made for use as medicine. They may be injected into the affected joints to temporarily relieve pain. This is a short-term measure, generally not recommended for more than two to four treatments per year. Oral corticosteroids are not routinely used to treat osteoarthritis. They are occasionally used for inflammatory flares.

**Hyaluronic acid substitutes**: Sometimes called viscosupplements, hyaluronic acid substitutes are designed to replace a normal component of the joint involved in joint lubrication and nutrition. Depending on the particular product your doctor prescribes, it will be given in a series of three to five injections. These products are approved only for osteoarthritis of the knee.

**Other medications**: Doctors may prescribe several other medicines for osteoarthritis. They include topical pain-relieving creams, rubs, and sprays, which are applied directly to the skin over painful joints.

**Surgery**

For many people, surgery helps relieve the pain and disability of osteoarthritis. Surgery may be performed to achieve one or more of the following:

- Removal of loose pieces of bone and cartilage from the joint if they are causing symptoms of buckling or locking (arthroscopic debridement).
- Repositioning of bones (osteotomy).
- Resurfacing (smoothing out) bones (joint resurfacing).

Surgeons may replace affected joints with artificial joints called prostheses. These joints can be made from metal alloys, high-density plastic, and ceramic material. Some prostheses are joined to bone surfaces with special cements. Others have porous
surfaces and rely on the growth of bone into that surface (a process called biologic fixation) to hold them in place. Artificial joints can last 10 to 15 years or longer. Surgeons choose the design and components of prostheses according to their patient’s weight, sex, age, activity level, and other medical conditions.

Joint replacement advances have included the ability, in some cases, to replace only the damaged part of the knee joint, leaving undamaged parts of the joint intact, and the ability to perform hip replacement through much smaller incisions than previously possible.

The decision to use surgery depends on several factors, including the patient’s age, occupation, level of disability, pain intensity, and the degree to which arthritis interferes with his or her lifestyle. After surgery and rehabilitation, the patient usually feels less pain and swelling and can move more easily.

Who Provides Care for People With Osteoarthritis?

Treating arthritis often requires a multidisciplinary or team approach. Many types of health professionals care for people with arthritis. You may choose a few or more of the following professionals to be part of your health care team:

**Primary care physicians:** Doctors who treat patients before they are referred to other specialists in the health care system. Often a primary care physician will be the main doctor to treat your arthritis. Primary care physicians also handle other medical problems and coordinate the care you receive from other physicians and health care providers.

**Rheumatologists:** Doctors who specialize in treating arthritis and related conditions that affect joints, muscles, and bones.

**Orthopaedists:** Surgeons who specialize in the treatment of, and surgery for, bone and joint diseases.

**Physical therapists:** Health professionals who work with patients to improve joint function.

**Occupational therapists:** Health professionals who teach ways to protect
joints, minimize pain, perform activities of daily living, and conserve energy.

**Dietitians:** Health professionals who teach ways to use a good diet to improve health and maintain a healthy weight.

**Nurse educators:** Nurses who specialize in helping patients understand their overall condition and implement their treatment plans.

**Physiatrists (rehabilitation specialists):** Medical doctors who help patients make the most of their physical potential.

**Licensed acupuncture therapists:** Health professionals who reduce pain and improve physical functioning by inserting fine needles into the skin at specific points on the body.

**Psychologists:** Health professionals who seek to help patients cope with difficulties in the home and workplace resulting from their medical conditions.

**Social workers:** Professionals who assist patients with social challenges caused by disability, unemployment, financial hardships, home health care, and other needs resulting from their medical conditions.

**Chiropractors:** Health professionals who focus treatment on the relationship between the body's structure—mainly the spine—and its functioning.

**Massage therapists:** Health professionals who press, rub, and otherwise manipulate the muscles and other soft tissues of the body. They most often use their hands and fingers, but may use their forearms, elbows, or feet.

**Research Highlights**

The leading role in osteoarthritis research is played by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), part of the National Institutes of Health (NIH). The NIAMS funds many researchers across the United States to study osteoarthritis.

One area of focus of osteoarthritis research in recent years has been the potential role of inflammation in the disease. One NIAMS-supported study found that a pathway called the complement system, which is a major component of the innate immune system, is critical to the development of osteoarthritis.
Researchers found that expression and activation of complement is abnormally high in people with osteoarthritis. The researchers confirmed the role of the pathway in mice, which are an animal model for osteoarthritis.

If these findings about the complement's role hold true in people, blocking a part of the complement system may be an effective treatment for early osteoarthritis. Other key areas of research supported by the NIAMS and other institutes within NIH include the following:

**Biomarkers**

The Osteoarthritis Initiative (OAI) is a multicenter, longitudinal, prospective, observational study of knee osteoarthritis that was launched by NIH in 2002. The overall aim of the OAI is to develop a public-domain research resource to facilitate the scientific evaluation of biomarkers for osteoarthritis as potential surrogate endpoints for disease onset and progression. The goals of the OAI were to enroll approximately 5,000 volunteers with risk factors for early knee osteoarthritis, and to collect clinical and imaging data and biological specimens from these participants for originally 4, and now a total of 8 years of follow up.

This study is expected to advance our understanding of how modifiable and nonmodifiable risk factors are linked to development and worsening of knee osteoarthritis. Such findings may, in turn, lead to improved strategies for prevention of disease and identification of novel treatment targets, which could result in prevention of later-life disability in individuals with knee osteoarthritis.

**Diagnostic Tools**

Scientists are exploring various methods to detect and monitor cartilage changes that could eventually enable doctors to diagnose osteoarthritis long before traditional x rays would show damage. It could also allow clinicians the opportunity to monitor the impact of therapeutic interventions very early in the disease process.

**Pharmacologic Treatments**

Researchers are looking for drugs that would prevent, slow down, or reverse joint damage.
For example, researchers supported by the NIAMS have shown that teriparatide, a form of human parathyroid hormone that triggers new bone formation and is approved to treat osteoporosis, can restore cartilage in a mouse model of injury-induced osteoarthritis of the knee. More studies are needed.

**Complementary and Alternative Therapies**

The Glucosamine/Chondroitin Arthritis Intervention Trial (GAIT), which was cosponsored by the National Center for Complementary and Alternative Medicine (NCCAM) and the NIAMS, assessed the effectiveness and safety of these nutritional supplements when taken together or separately. The trial found that the combination of glucosamine and chondroitin sulfate did not provide significant relief from osteoarthritis pain among all participants. However, a subgroup of study participants with moderate-to-severe pain showed significant relief with the combined supplements. The 4-year trial was conducted at 16 sites across the United States.

**Healing Joint Injuries and Cartilage Damage**

When the anterior cruciate ligament (ACL)—one of the main ligaments of the knee, which connects the shin bone to the thigh—is torn, it doesn’t heal the way other tissues do. Unless the tear is repaired, the knee can become unstable, resulting in damage to the joint surfaces and the eventual development of knee osteoarthritis. Traditionally, repair has involved replacing the ligament with ligament or tendon graft, but NIAMS-funded research shows that filling the tear with a collagen- and platelet-rich gel material may enable it to heal, making a graft unnecessary. Physicians believe that preserving the patient’s own ACL (if it becomes possible) would likely better protect the mechanics of the knee.

Other NIAMS-supported scientists are researching a way to patch damaged cartilage that will allow new cartilage to grow in and repair the damage. Using a unique weaving machine of their own design, the researchers have created a three-dimensional fabric scaffold patch. In laboratory tests, the scaffold had the same mechanical properties as native cartilage.
Genetic Studies

Osteoarthritis in all its various forms appears to have a strong but complex genetic connection. Gene mutations may be a factor in predisposing individuals to develop osteoarthritis. For example, scientists have identified a mutation (a gene defect) affecting collagen, an important part of cartilage, in patients with an inherited kind of osteoarthritis that starts at an early age. The mutation weakens collagen protein, which may break or tear more easily under stress.

The Johnston County Osteoarthritis Project, a NIAMS-supported University of North Carolina study focusing on a group of 5,000 adults, age 45 or older, identified six genes—ABCG2, GDF5, IL1RN, IL6, and VDR—that appear to increase susceptibility to knee osteoarthritis.

Patient Education and Self-Management

When patients understand and feel that they have some control over their chronic disease, the course of their disease is often improved. Researchers are investigating a variety of self-management approaches in people with osteoarthritis, including coping skills training, exercise training, patient education, and social support. These strategies have shown some success in managing pain and improving function.

Exercise and Weight Reduction

Exercise and weight reduction/management play a key part in a comprehensive treatment plan. Researchers are studying exercise in greater detail and finding out just how to use it in treating or preventing osteoarthritis. Studies have shown that losing extra weight can help people who already have osteoarthritis. Moreover, overweight or obese people who do not have osteoarthritis may reduce their risk of developing the disease by losing weight.

More information on research is available from the following websites:

- [NIH Clinical Research Trials and You](https://www.niams.nih.gov/Health_info/Osteoarthritis/default.asp) was designed to help people learn more about clinical trials, why they matter, and how to participate. Visitors to the website will find
information about the basics of participating in a clinical trial, first-hand stories from clinical trial volunteers, explanations from researchers, and links on how to search for a trial or enroll in a research-matching program.

- **ClinicalTrials.gov** offers up-to-date information for locating federally and privately supported clinical trials for a wide range of diseases and conditions.

- **NIH RePORTER** is an electronic tool that allows users to search a repository of both intramural and extramural NIH-funded research projects from the past 25 years and access publications (since 1985) and patents resulting from NIH funding.

- **PubMed** is a free service of the U.S. National Library of Medicine that lets you search millions of journal citations and abstracts in the fields of medicine, nursing, dentistry, veterinary medicine, the health care system, and preclinical sciences.

### Hope for the Future

Research is opening up new avenues of treatment for people with osteoarthritis. A balanced, comprehensive approach is still the key to staying active and healthy with the disease. People with osteoarthritis should combine exercise, relaxation, education, social support, and medications in their treatment strategies. Meanwhile, as scientists unravel the complexities of the disease, new treatments and prevention methods should become apparent. Such developments are expected to improve the quality of life for people with osteoarthritis and their families.

### For More Information

**National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)**  
Information Clearinghouse  
National Institutes of Health

1 AMS Circle  
Bethesda, MD 20892-3675  
Phone: 301-495-4484  
Toll free: 877-22-NIAMS (877-226-4267)  
TTY: 301-565-2966  
Fax: 301-718-6366
Email: NIAMSinfo@mail.nih.gov
Website: https://www.niams.nih.gov

If you need more information about available resources in your language or another language, please visit our website or contact the NIAMS Information Clearinghouse at NIAMSinfo@mail.nih.gov.

Other Resources

NIH Osteoporosis and Related Bone Diseases ~ National Resource Center

2 AMS Circle
Bethesda, MD 20892-3676
Phone: 202-223-0344
Toll free: 800-624-BONE (2663)
TTY: 202-466-4315
Fax: 202-293-2356
Email: NIHBoneInfo@mail.nih.gov
Website: http://www.bones.nih.gov

National Institute on Aging
Website: http://www.nia.nih.gov/

American Academy of Orthopaedic Surgeons
Website: http://www.aaos.org (con información en español)

American College of Rheumatology
Website: http://www.rheumatology.org

American Physical Therapy Association
Website: http://www.apta.org (con información en español)

Arthritis Foundation
Website: http://www.arthritis.org

Key Words

Biomarkers. Physical signs or biological substances that indicate changes in bone or cartilage. Doctors believe they may one day be able to use biomarkers for diagnosing osteoarthritis before it causes noticeable joint damage and for monitoring the progression of the disease and its responsiveness to treatment.

Bone spurs. Small growths of bone that can occur on the edges of a joint affected by osteoarthritis. These growths are also known
as osteophytes.

**Cartilage.** A hard but slippery coating on the end of each bone. The breakdown of joint cartilage is the primary feature of osteoarthritis.

**Chondroitin sulfate.** A naturally existing substance in joint cartilage that is believed to draw fluid into the cartilage. Chondroitin is often taken in supplement form along with glucosamine as a treatment for osteoarthritis. See the "nutritional supplements" section under “Complementary and Alternative Therapies” for more information.

**Collagen.** A family of fibrous proteins that are components of cartilage. Collagens are the building blocks of skin, tendon, bone, and other connective tissues.

**Corticosteroids.** Powerful anti-inflammatory hormones made naturally in the body or man-made for use as medicine. Corticosteroids may be injected into the affected joints to temporarily reduce inflammation and relieve pain.

**COX-2 inhibitors.** A relatively new class of nonsteroidal anti-inflammatory drugs (NSAIDs) that are formulated to relieve pain and inflammation. For information about the risk posed by NSAIDs, see “NSAIDs” in the “How Is Osteoarthritis Treated?” section.

**Glucosamine.** A substance that occurs naturally in the body, providing the building blocks to make and repair cartilage. See the “nutritional supplements” section under “Complementary and Alternative Therapies” for more information.

**Hyaluronic acid.** A substance that gives healthy joint fluid its viscous (slippery) property and that may be reduced in people with osteoarthritis. For some people with osteoarthritis of the knee, replacing hyaluronic acid with injections of agents referred to as viscosupplements is useful for increasing lubrication, reducing pain, and improving function.

**Joint capsule.** A tough membrane sac that holds the bones and other joint parts together.

**Joint resurfacing.** A procedure in which the damaged cartilage surfaces are replaced while the rest of the joint is left intact.
Ligaments. Tough bands of connective tissue that attach bones to each other, providing stability.

Magnetic resonance imaging (MRI). Provides high-resolution computerized images of internal body tissues. This procedure uses a strong magnet that passes a force through the body to create these images.

Muscles. Bundles of specialized cells that contract and relax to produce movement when stimulated by nerves.

Nonsteroidal anti-inflammatory drugs (NSAIDs). A class of medications available over the counter or with a prescription that ease pain and inflammation. Commonly used NSAIDs include ibuprofen, naproxen sodium, and ketoprofen. For information about the risks posed by NSAIDs, see “NSAIDs” in the “How Is Osteoarthritis Treated?” section.

Osteoarthritis. The most common form of arthritis. It is characterized by the breakdown of joint cartilage, leading to pain, stiffness, and disability.

Osteophytes. Small growths of bone that can appear on the edges of a joint affected by osteoarthritis. These growths are also known as bone spurs.

Osteotomy. A procedure that involves cutting and realigning bone, to shift the weight from a damaged and painful bone surface to a healthier one.

Rheumatoid arthritis. A form of arthritis in which the immune system attacks the tissues of the joints, leading to pain, inflammation, and eventually joint damage and malformation. It typically begins at a younger age than osteoarthritis does, causes swelling and redness in joints, and may make people feel sick, tired, and feverish. Rheumatoid arthritis may also affect skin tissue, the lungs, the eyes, or the blood vessels.

Synovium. A thin membrane inside the joint capsule that secretes synovial fluid.

Synovial fluid. A fluid secreted by the synovium that lubricates the joint and keeps the cartilage smooth and healthy.

Tendons. Tough, fibrous cords that connect muscles to bones.
Transcutaneous electrical nerve stimulation (TENS). A technique that uses a small electronic device to direct mild electric pulses to nerve endings that lie beneath the skin in a painful area. TENS may relieve some arthritis pain. It seems to work by blocking pain messages to the brain and by modifying pain perception.

X ray. A procedure in which low-level radiation is passed through the body to produce a picture called a radiograph. X rays of joints affected by osteoarthritis can show such things as cartilage loss, bone damage, and bone spurs.

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The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), a part of the U.S. Department of Health and Human Services’ National Institutes of Health (NIH), is to support research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases; the training of basic and clinical scientists to carry out this research; and the dissemination of information on research progress in these diseases. The NIAMS Information Clearinghouse is a public service sponsored by the NIAMS that provides health information and information sources. Additional information can be found on the NIAMS website at www.niams.nih.gov.

For Your Information

This publication contains information about
medications used to treat the health condition discussed here. When this publication was developed, we included the most up-to-date (accurate) information available. Occasionally, new information on medication is released.

For updates and for any questions about any medications you are taking, please contact

**U.S. Food and Drug Administration**

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