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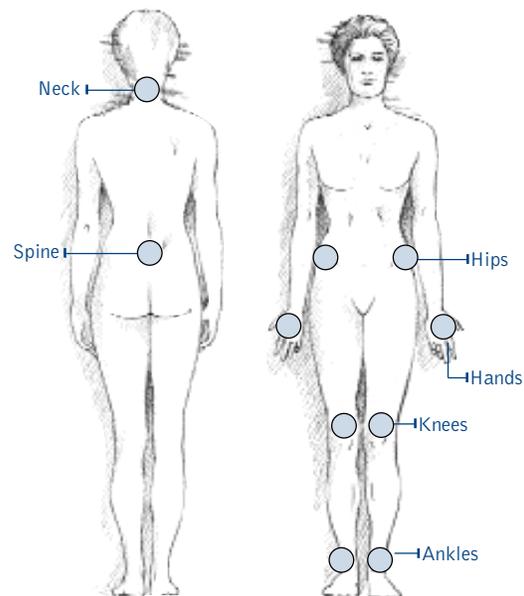
Osteoarthritis

WHAT IS OSTEOARTHRITIS?

Osteoarthritis, or OA, is the oldest and most common form of arthritis. In osteoarthritis, changes occur in both the cartilage and bone of joints that lead to joint pain, stiffness and swelling. OA also is known by many other names, such as degenerative joint disease, arthrosis, osteoarthrosis or hypertrophic arthritis. Risk factors for OA include being overweight, joint injury, muscle weakness, having other forms of arthritis, and heredity.

Osteoarthritis can affect any joint, but it occurs most often in knees, hips, spine, small joints of the fingers, and the base of the thumb and big toe. It rarely affects other joints, except as a result of previous injury to the joint or unusual stress on the joint.

Nearly 21 million people in the United States have osteoarthritis. Although OA affects millions of people, not everyone has joint symptoms because of it. Osteoarthritis can be a serious condition, but it is treatable – most people do get better with treatment. Getting a correct diagnosis and working with your doctor to design the best treatment plan is important.



Joints that may be affected by OA

WHAT HAPPENS IN OSTEOARTHRITIS?

In normal joints, a firm, rubbery material called *cartilage* covers the end of each bone. Cartilage provides a smooth, gliding surface for joint motion and acts as a cushion between the bones. In osteoarthritis, the cartilage between the joints breaks down, leading to symptoms such as pain, swelling and problems using the joint.

There are several phases in osteoarthritis:

1. Cartilage loses its elasticity and is more easily damaged by injury or excessive use. The timing and extent to which these changes occur also is influenced by heredity, trauma to the joint and other factors.
2. As the cartilage breaks down, changes occur in the underlying bone, which becomes thickened with the formation of bony growths called spurs, from the bone surface.
3. Fluid-filled cysts may form in the bone near the joint. Bits of bone or cartilage may float loosely in the joint space.
4. Finally, the synovium becomes inflamed as a result of the cartilage breakdown. This inflammation produces *cytokines* (inflammatory proteins) and enzymes that may damage the cartilage further.

In addition to the breakdown of cartilage and changes in the bone, the fluid in the joint called *synovial fluid* may play a role in osteoarthritis. In the joint, synovial fluid lubricates the joint and is needed for movement of the joint. Joint fluid is made up mostly of a substance called *hyaluronan*. In osteoarthritis, there may be more hyaluronan than usual, but it may be diluted. There also may be a change in the quality of the hyaluronan in joint fluid, which may reduce its protective function.

Symptoms

Usually joints affected by osteoarthritis hurt most after you've used them too much or too little. You probably will find it difficult to move the joint after first getting up in the morning or following more-than-usual use of the joint.

If you don't move and exercise, the muscles around the affected joint will become weaker

and sometimes even smaller in size. In turn, the weak muscles may not be able to support the joint as well. This may contribute to increased joint pain. You also may notice that your coordination, walking and posture become affected.

OA IN THE HIPS

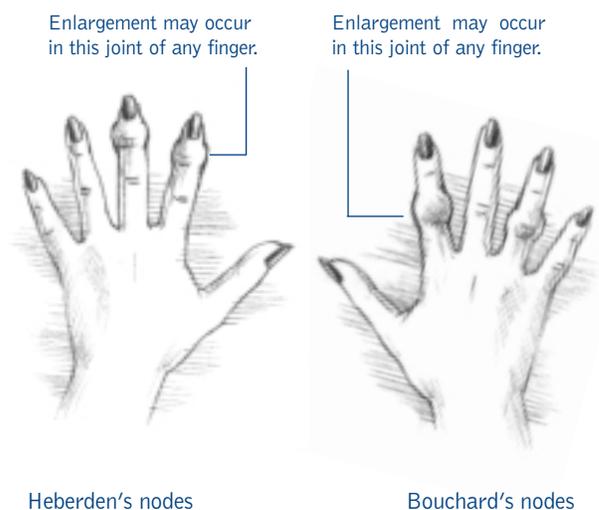
If your hips are affected by OA, you may feel pain in the groin, inner thigh or buttock. Some people feel *referred pain* in the knee or along the side of the thigh (that is, they perceive pain in an area that isn't actually affected by the condition). The pain may cause you to limp when you walk.

OA IN THE KNEES

You may feel pain especially when you move your knee. You may feel a "grating" or "catching" sensation in your knee when you move it. It may be painful to walk up or down stairs or to get up from a chair. If the pain prevents you from moving or exercising your leg, the large muscles in your thigh become weaker.

OA IN THE FINGERS

OA in the finger joints can cause pain, swelling and eventually bony growths (spurs) to form in



these joints. If these spurs occur in the end joints of the fingers, they are called Heberden's nodes. If they occur in the joints in the middle of the fingers, they are called Bouchard's nodes.

Both Heberden's and Bouchard's nodes may appear first in one or a few fingers and then develop in others. You may notice redness, swelling, tenderness and aching in the affected joint, especially in the early stages of osteoarthritis. Although these nodes may make your finger joints intermittently painful and the joints may appear enlarged, you'll probably still have good use of your hands.

OA IN THE FEET

If OA affects your feet, you may feel pain and tenderness in the large joint at the base of the big toe. Wearing tight shoes and high heels can worsen the pain.

OA IN THE SPINE

Chronic breakdown of discs in the spine and resulting bony overgrowth may cause stiffness and pain in the neck and back, and also may place extra pressure on the nerves in the spinal column. This is commonly referred to as pinched nerves. You may feel pain in your neck, shoulder, arm, lower back or into the legs. Such radiating pain also may be associated with weakness or numbness in your arms or legs, if nerves are being pinched.

Differences Between Osteoarthritis and Rheumatoid Arthritis

Some people confuse osteoarthritis with rheumatoid arthritis. As you'll see in the chart, these diseases are different. Some people can have both osteoarthritis and rheumatoid arthritis at the same time.

Some people also may confuse osteoarthritis with osteoporosis. Both diseases involve problems with bone (literally, *osteo* means bone), but they are not the same. Osteoporosis causes bones to lose mass and become brittle, which can lead to loss of height and painful fractures.

WHAT CAUSES OSTEOARTHRITIS?

The cause of osteoarthritis is not known, but researchers have shown that there are several factors that increase your risk of developing OA. These factors include heredity, obesity, injury to the joint, repeated overuse of certain joints, muscle weakness, nerve injury and aging. These factors are discussed on the following pages.

OA and RA Differences

OSTEOARTHRITIS	RHEUMATOID ARTHRITIS
Usually begins after age 40	Usually begins between ages 25 and 50
Affects 21 million adult Americans	Affects 2.1 million adult Americans
Usually develops slowly, over many years	May develop suddenly, within weeks or months
Affects a few joints and may occur on both sides of the body	Usually affects many joints, primarily the small joints on both sides of the body
Joint redness, warmth and swelling are usually minimal. Morning stiffness is common and may be severe but brief (less than 20 minutes).	Causes redness, warmth, swelling and prolonged morning stiffness of the joints, often lasting for hours
Typically affects only certain joints, such as the hands, hips, knees and spine. Rarely affects wrists, elbows or ankles except after injury.	Affects many joints, including wrists, elbows and shoulders
Does not cause a general feeling of sickness	Often causes a general feeling of sickness and fatigue, as well as weight loss

Heredity

In some families, OA appears to be inherited and passed from one generation to another. This might occur as a result of abnormal genes that form cartilage and bone in joints or as a result of inherited traits that affect the shape or stability of joints. For example, there is some evidence that genes responsible for *collagen*, a major protein component of cartilage, may be associated with osteoarthritis. This might lead to weak cartilage that breaks down more easily. People born with slight defects that make their joints fit together incorrectly or move incorrectly, such as bowlegs or a congenitally abnormal hip, may be more likely to develop OA. Being born with *laxity* (too much motion on a joint) also may increase the tendency to develop osteoarthritis.

Obesity

Studies indicate that being overweight increases the risk for OA of the knees. Researchers have found that increased body weight affects a person's risk for developing knee osteoarthritis, particularly in the eight to 12 years before symptoms appear. Therefore, avoiding excess weight gain as you grow older or losing excess weight may help prevent osteoarthritis in the knee.

Muscle Weakness

Studies have shown that individuals with weak quadriceps (thigh) muscles may be more likely to develop OA of the knee than people who do not have muscle weakness.

Injury or Overuse

Some people may develop osteoarthritis in certain joints due to an injury or specific types of overuse. A history of significant injury to the knee or hip increases your risk for developing OA in these joints. For instance, football, soccer and

skiing increase the risk of OA, which often occurs much earlier in life. Avoiding trauma or injury to a joint and seeking medical help early following an injury may help prevent osteoarthritis.

Joints that are used repeatedly in certain jobs may develop osteoarthritis. Jobs that require repeated knee bending appear to increase the risk for OA in the knees. For instance, some studies indicate that miners and shipyard or dock workers have higher rates of OA in the knees. Fortunately, there are ways to modify jobs to prevent damage to joints from overuse.

Aging

Incidence of osteoarthritis increases with age, and it is most common in people over age 65. Osteoarthritis affects both men and women. Up to age 55, OA is more common in men; beyond that age, it is more common in women.

CAN OSTEOARTHRITIS BE PREVENTED?

Doctors believe that many cases of OA can be prevented. Some of the same techniques used to treat OA also can be used to help prevent it. Weight control and staying physically active are very important to help prevent OA of the knee. Being careful to avoid certain occupational and joint injuries also can help prevent OA.

HOW IS IT DIAGNOSED?

Your doctor usually diagnoses osteoarthritis based on your medical history and a physical examination. However, your doctor also may recommend additional procedures, such as X-rays, to help confirm the diagnosis, rule out other causes of pain, and determine how much joint damage has occurred. Joint aspiration, a procedure in which fluid is drained from the affected joints and examined, also may be used to rule out other diseases.

HOW CAN IT BE MANAGED?

A good treatment program can help you decrease joint pain and stiffness, improve joint movement and increase your ability to do everyday activities. A plan will be designed especially for you and should include a combination of physical and/or occupational therapy, exercise, weight control, patient education and medication. When these measures don't help, surgery may be considered.

Your treatment program will be based on how severe your disease is, which joints are affected, the nature of your symptoms and other medical problems. Your age, occupation and everyday activities also will be taken into consideration. You will work in partnership with your doctor and other health professionals, such as physical and occupational therapists, to make sure your program meets your needs.

Physical and Occupational Therapy

You may find that OA limits certain activities, such as walking, bathing, dressing, stair climbing and doing household chores. Physical and occupational therapists can help improve your ability to perform these activities of daily living by:

- improving your joint range-of-motion and muscle strength;
- providing assistive devices such as canes, crutches, walkers, braces or shoe inserts;
- teaching you how properly to use heat therapy and cold therapy;
- fitting you with splints or braces;
- teaching you principles of proper joint use and energy conservation.

The benefits of physical and occupational therapy include less pain, greater ease in doing daily tasks and less stress on joints.

Stretching

Slow, gentle stretches can help prevent joint stiffness and make it easier to get moving in the morning. Some experts think alternative exercise such as yoga and tai chi can be beneficial for people with arthritis. These forms of exercise can improve flexibility, increase muscle strength and help you relax.

If you don't feel ready for a stretching class such as yoga or tai chi, your doctor or physical therapist can teach you gentle stretches that you can do at home.

Aerobic Exercise

Doing regular aerobic exercise is extremely important in successfully controlling OA. There are many benefits to exercise, including reduced pain and improved function.

Aerobic aquatic exercises and walking are less stressful on your joints and are good for your overall fitness. The Arthritis Foundation offers water exercise classes. For more information, contact your local office. Exercises that maintain strength in the muscles around affected joints also are important. Work with the members of your health-care team to design a program that is right for you.

Weight Control

Staying at your recommended weight or losing weight if you are overweight has a number of benefits, including living longer and helping prevent OA of the knees. If you already have osteoarthritis, losing weight or maintaining your recommended weight lessens pain by reducing stress on the weight-bearing joints (hips, knees, back and feet). It also helps you look and feel better.

The formula for losing weight is to eat fewer calories and increase your physical activity, especially activities like swimming and walking.

Work with your doctor to find the best weight-loss program for you.

Patient Education

Working in partnership with your health-care team involves taking a more active role in your own treatment. You may be able to manage your condition better if you:

- learn as much as you can about OA, and ask your doctor what changes you can expect;
- take time to “grieve” for those things you no longer can do, then focus on what you can do and discover new activities that give you joy and a sense of purpose;
- talk about your feelings and problems so your family and friends understand;
- learn to think positively.

Although your osteoarthritis won't go away, you can play a large part in controlling its symptoms.

Medication

Many people are able to treat their OA symptoms with exercise, physical therapy or the other techniques just discussed. Your doctor may recommend medications to help relieve pain. Some medications are taken on a daily basis; others are not. Your doctor will decide which medication and schedule is best for you. Many common OA medications are discussed here, and others are under study for possible use in the future.

NON-NARCOTIC AND NARCOTIC ANALGESICS

Analgesics are drugs that relieve pain. Acetaminophen (*Tylenol*) is a non-narcotic analgesic often used for pain relief. It does not reduce the inflammation or swelling that can sometimes be associated with OA, but is helpful when pain is

the main problem, and is safer than NSAIDs for most people (see below). Although relief may be limited, taking full doses of acetaminophen is worth trying as an initial therapy because of its cost and safety advantages.

Tramadol (*Ultram*) may help people with moderate to severe pain. Tramadol must be used with caution. It can cause seizures, dizziness, nausea and constipation. It also carries a small risk of drug dependence.

Propoxyphene hydrochloride (*Darvon*), a mild narcotic analgesic, may be helpful but may produce drug dependence if used over long periods of time. More potent narcotics such as codeine may occasionally be prescribed for severe pain, but their use should generally be limited.

NSAIDS

Nonsteroidal anti-inflammatory drugs, or NSAIDs, help reduce joint pain, stiffness and swelling. Besides aspirin, ibuprofen, naproxen sodium and ketoprofen, which are available over the counter, more than a dozen prescription NSAIDs are available to treat OA.

NSAIDs and aspirin can cause side effects such as stomach pain or even bleeding. If you experience these side effects, your doctor may prescribe additional medications that may help reduce the risk of these side effects or another medication for OA that has minimal effects on the stomach. Most physicians recommend that patients take NSAIDs with food to prevent symptoms related to stomach problems.

Taken in full doses, the various NSAIDs and aspirin usually have similar levels of anti-inflammatory and pain-relieving effects. One of the added benefits of using NSAIDs or aspirin in OA is that they provide some protection against heart attacks or strokes. You should not take aspirin while taking another NSAID or combine

different NSAIDs unless advised to do so by your physician. New NSAIDs with less potential to harm the stomach also are available.

COX-2 inhibitors, such as celecoxib (*Celebrex*) and rofecoxib (*Vioxx*), are a subcategory of NSAIDs that may be safer for the stomach. All NSAIDs work by blocking the production of substances called *prostaglandins*. Traditional NSAIDs, however, not only block prostaglandins at the site of inflammation, but also in organs such as the stomach where the prostaglandins provide protection from irritation.

COX-2 inhibitors block production of prostaglandins at the inflammation site, but do not affect prostaglandins in other sites in the body such as the stomach. As a result, there is a reduced risk of stomach problems such as pain or bleeding with the COX-2 inhibitors. COX-2s don't affect platelets or blood vessels, and therefore do not provide protection against strokes or heart attacks, and low-dose aspirin therapy may need to be added for patients at risk for heart attacks or strokes. All NSAIDs, including COX-2s, occasionally can cause a decline in kidney function.

INJECTABLE GLUCOCORTICOIDS

Glucocorticoids are related to cortisone, a natural body hormone. They may be injected into the joint following joint aspiration to relieve the pain and swelling associated with OA. Glucocorticoid injections in the same joint usually are limited to three or four per year because repeated joint injections, especially in weight-bearing joints, such as the knees, can result in cartilage damage.

HYALURONIC ACID THERAPY

Hyaluronic acid therapy is a new treatment for the pain of osteoarthritis of the knee in people who have not responded to basic treatment programs and the use of mild analgesics.

It may be considered, in particular, for patients who can't tolerate or don't respond to NSAIDs. The procedure involves injecting the knee joint with hyaluronan, a substance found naturally in joint fluid that helps to lubricate and cushion the joint. In people with knee OA, inflammation causes hyaluronan to break down.

Hyaluronan (*Hyalgan*) and hylan G-F 20 (*Synvisc*) are two kinds of hyaluronic acid therapy that are approved by the FDA to treat OA of the knee. Hyaluronan injections are given directly into the knee joint once a week for three to five weeks, depending on which product is used. Pain relief following hyaluronan treatments can last for months. Studies have shown that these injections may be as effective in relieving knee pain as NSAID therapy.

Most studies show that hyaluronic acid therapy is most effective for patients with mild to moderate osteoarthritis. Side effects are uncommon, but may include pain, swelling and localized redness at the injection site.

TOPICAL ANALGESICS

Topical analgesics are pain-relieving medications in the form of creams, rubs or sprays applied on the skin over a painful joint. They contain combinations of salicylates, skin irritants and local anesthetics to relieve pain.

Salicylates, such as methylsalicylate, work by stimulating blood flow. Irritants stimulate nerve endings in the skin to cause feelings of cold or warmth, which distract attention from the actual pain.

Topical pain relievers containing capsaicin work by reducing the amount of substance P, which sends pain signals to the brain. Some people may at first feel a burning sensation at the place where capsaicin is applied, but this usually goes away with repeated applications.

NUTRITIONAL SUPPLEMENTS

Some nutritional supplements, such as glucosamine and chondroitin sulfate, have been popularized as treatments for osteoarthritis. Glucosamine and chondroitin sulfate are natural substances found within cartilage. Some researchers think these substances may help repair and maintain cartilage. Some studies have shown that these supplements provide the same pain relief as NSAIDs.

A study done at the University of Liege in Belgium showed that glucosamine slows the progression of osteoarthritis of the knee. In the study, people with mild to moderate osteoarthritis of the knee who took glucosamine once a day for three years had X-ray evidence that the drug slowed the loss of cartilage.

An in-depth clinical study of chondroitin sulfate and the combination of glucosamine and chondroitin sulfate in people with knee OA is now being carried out with support from the National Institutes of Health. The study will provide additional information about the role of these supplements in OA management.

Surgery

Most people with OA will never need surgery. However, surgery may be helpful when there is major joint damage, persistent joint pain and disabilities brought about because of limitations in joint movement.

Osteotomy corrects limb malalignment by cutting and repositioning the bone, then resetting it in a better position. Osteotomy of the tibia (shinbone) is performed to change the weight-bearing position of the leg to put more weight on the undamaged cartilage and reduce knee pain.

Total joint arthroplasty involves replacing the joint surfaces destroyed by arthritis.

Surgeons can replace damaged joints with

artificial joints made of metal, plastic or ceramic. There are man-made replacements available for most of the major joints. Some replacement joints are attached to the bones with a type of bone cement. More recently, new artificial joints that don't need this bone cement are being used. The joint pieces have tiny holes, rough surfaces or a special coating to allow the bone to attach to the joint. It takes longer to recover from surgery with this type of joint, but because these joints last longer, they may be of special value in younger people.

Arthroscopy allows the surgeon directly to examine the inside of the joint to determine the extent of cartilage damage. In addition, arthroscopy also may be used to remove parts of the damaged cartilage in the early stages of arthritis or to remove loose particles. These procedures and/or the flushing that is performed during the arthroscopy may reduce pain and improve function for people with knee OA.

Cartilage transplant is being performed in people who have a very localized cartilage defect, typically due to an injury. It is not yet approved for use in OA where the cartilage thinning and loss is much more extensive.

Acupuncture

There is some evidence that acupuncture may be useful to ease the pain of OA. Clinical studies are under way to determine if it is an effective treatment for OA of the knee. Speak with your doctor if you are considering trying acupuncture, and be sure the practitioner you plan to see is certified or licensed.

Ongoing Communication with Your Health-Care Team

A number of health-care professionals play an active role in your care. Studies indicate that such

a multi-disciplinary approach results in improved function and reduced pain for the patient.

Ongoing and open communication with your doctor and other health-care professionals can go a long way in the successful management of osteoarthritis. Keep a health log, so you'll be prepared to discuss such issues as joint pain, drug reactions, doses and treatment compliance with your doctor.

THE ARTHRITIS FOUNDATION

The mission of the Arthritis Foundation is to improve lives through leadership in the prevention, control and cure of arthritis and related diseases.

The Arthritis Foundation supports research with the greatest potential for advances and has invested more than \$320 million in these efforts since its inception in 1948. Additionally, the Arthritis Foundation supports key public policy and advocacy efforts at a local and national level

in order to make a difference on behalf of 70 million people living with arthritis.

As your partner in taking greater control of arthritis, the Arthritis Foundation also offers a large number of programs and services nationwide to make life with arthritis easier and less painful and to help you become an active partner in your own health care.

Contact us at (800) 283-7800 or visit us on the Web at www.arthritis.org to become an Arthritis Advocate or to find out how you can become involved.

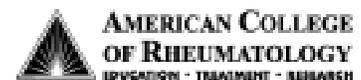
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For more information: The Arthritis Foundation offers a wide variety of books, brochures and videos about different forms of arthritis, treatment and self-management techniques to help you take control of your arthritis. To order any of these products, become an Arthritis Foundation member or to subscribe to the Arthritis Foundation's award-winning consumer health magazine, *Arthritis Today*, call (800) 283-7800. Call or visit our Web site (www.arthritis.org) to find out how you can take control of your arthritis and start living better today!

MISSION STATEMENT:

The mission of the Arthritis Foundation is to improve lives through leadership in the prevention, control and cure of arthritis and related diseases.

This brochure has been reviewed by the AMERICAN COLLEGE OF RHEUMATOLOGY.



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