

Osteoarthritis



Introduction



- **Osteoarthritis** is the most common disease in humans
 - Almost everyone experiences some effects by the age of 70
- It is a **natural inflammatory disease** of wear and tear that begins when joint cartilage starts to become worn
 - Cartilage works as a “shock absorber” to reduce stress on the joint
 - When it is worn away, increased stress on the joint causes pain and instability
 - As the cartilage continues to wear down, it may disappear altogether in some spots, leaving bone to grind against bone
- According to the American College of Rheumatology, the **goals** of osteoarthritis management are to:
 - Control pain
 - Minimize disability
 - Provide education to the public and teach persons with the disease about prevention and treatment
- Two other types of arthritis commonly found in people are **rheumatoid arthritis** and **gout**
 - Sometimes, people with arthritis are not sure what kind they have; differing types have different presentations, diagnoses and treatments
 - **Rheumatoid arthritis** is an infectious, as well as an inflammatory, disease that causes symptoms such as fever and general malaise over the whole body
 - Gout is caused by the build up of uric acid crystals in the joint, causing a lot of pain, warmth and swelling
 - Common joints affected by gout are in the big toe and ankle
 - People can have several forms of arthritis at the same time
 - If you have any joint pain, see your primary care provider to help prevent joint deformity and loss of joint use

Did You Know?

Over half of Americans over age 65 have osteoarthritis to some extent



Health Professionals Who Treat Osteoarthritis

Many types of health professionals care for people with osteoarthritis

Medical Doctors

- **Primary care physicians:** Treat patients before they are referred to specialists
- **Rheumatologists:** Specialize in treating arthritis and related conditions that affect joints, muscles and bones
- **Orthopaedists:** Specialize in treatment of and surgery for bone and joint disease
- **Physiatrists (rehabilitation specialists):** Help patients make the most of their physical potential

Other Health Care Professionals

- **Physical therapists:** Work with patients to improve joint function
- **Occupational therapists:** Teach ways to protect joints, minimize pain and conserve energy
- **Dietitians:** Teach ways to use diet to improve health and maintain healthy weight
- **Nurse educators:** Specialize in helping patients understand their overall condition and implement treatment plans
- **Licensed acupuncture therapists:** Reduce pain and improve function by inserting fine needles into the skin at various points
- **Psychologists:** Help patients cope with difficulties in the home and workplace
- **Social workers:** Assist patients with social challenges caused by disability, unemployment, financial hardships, home health care and other needs

Is It

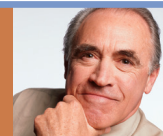
Osteoarthritis?



You may have osteoarthritis if:

- Your knees, hands, hips or back are often sore
 - Bending, kneeling, stair climbing are difficult
 - You have trouble opening jars, grasping objects
 - Joints are stiff and painful at the end of day
 - Joints may occasionally seem to give way
- You are stiff after periods of inactivity, but movement decreases stiffness
- You notice slight swelling and enlargement of joints
 - You notice bony lumps on the middle or end joints of your fingers or the base of your thumb
- Joints may not move as far or as freely as before
- There is discomfort in a joint before or during a change in the weather (a drop in barometric pressure)

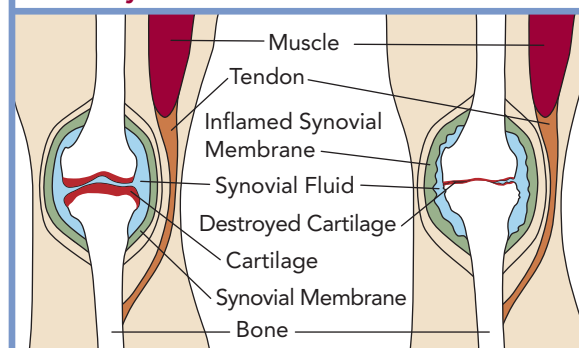
What Is Osteoarthritis?



- Osteoarthritis (OS-tee-oh-are-THRY-tis) (OA), also known as **degenerative joint disease**, is one of the most common types of arthritis
- Occurs when the cartilage cushioning the joint **breaks down**, causing bones to rub against each other, creating pain, swelling, bone spurs (tiny growths of new bone) and loss of movement
- Most commonly affecting middle-aged and older people
- Scientists don't know if it is a single disease or many disorders with a similar final presentation
- The **most common joint** affected is the knee joint, the second most common is the hip joint
 - Fingers, spine, the temporomandibular joint (TMJ) of the jaw and shoulders are other commonly affected joints

Healthy Joint

Arthritic Joint



6 Facts about Osteoarthritis

- 1 7 million people in the U.S. visit their health care provider each year for symptoms of osteoarthritis
- 2 80% of people with osteoarthritis report some limitations in activity
- 3 Osteoarthritis is the leading cause of disability in the U.S.
- 4 Knee osteoarthritis is often as disabling as any cardiovascular disease, except stroke
- 5 About 50% of persons with osteoarthritis do not know what type of arthritis they have and, as a result, cannot make informed decisions about their care
- 6 Musculoskeletal disease, like osteoarthritis, costs the U.S. economy nearly \$87 million per year in direct expenses, and lost wages and production

Clinical Features of Osteoarthritis

- **Chronic pain** that may last long after the inflammation of the disease has resolved
- **Stiffness:** On arising in the morning and after inactivity
 - This can be especially problematic for elders who are sedentary or can't move about
- **Tenderness** on pressure to the affected area
- **Bony swelling and crepitus** (a grating or crackling sound or sensation) - related to irregularity of the joint and loss of cartilage
- Bony swelling of the hands and joint deformity cause **Heberden's nodes**, or large, painful nodules of the joints at the end of the fingers
- **Loss of movement** and limited range of motion of the affected joints
- **Instability** of the affected joints, making falls common in older adults
- **Loss of function:** Inability to use hands, walk and bend
- **Depression and physical isolation** because of loss of function and pain
 - Many persons with severe osteoarthritis become unable to participate in family and community activities, causing social isolation and depression

Did You Know?

Osteoarthritis can affect the mind and emotions as much as the body and joints



Who Gets Osteoarthritis?



- Most often affects middle to older-aged adults
- 20 million Americans have symptoms
- 75% of women 60-70 years old have osteoarthritis in the joints of their hands
- Osteoarthritis of all joints occurs more often in women than men
- Osteoarthritis is more common in Europeans and Americans, and less common in African Americans, Asians, Indians and Chinese
- By age 80, there is a decline in the incidence of osteoarthritis in both men and women
- In a 2003 study, 30% of patients did not take prescribed medications for osteoarthritis; 27% did not do prescribed exercises
- 67% of patients advised to use an assistive device, such as a cane or walker, did not do so – leading to increased falls, fractures and negative outcomes

The Knee

- Most commonly affected joint
- Overloading the knee joint can cause cartilage breakdown and failure of the ligaments
 - For every 1 pound weight increase, the overall force across the knee in a single leg stance increases 2-3 pounds
- Knee laxity is a mechanical displacement or rotation of the tibial bone in relation to the femur bone; increases with age; greater in women than men
- **Proprioception** is the conscious and unconscious perception of joint position and movement

- Critical to joint stability
- Proprioceptive accuracy in the knee declines with age, worsens with inactivity

Most common causes of osteoarthritis of the knee include:

- Obesity (more destructive in women than in men)
- Genetic tendency
- Joint overuse or injury



Primary Causes of Osteoarthritis

- **Age** – with use, joints begin to deteriorate and the cartilage wears away
- **Menopausal** women have higher rates of osteoarthritis; may have lower estrogen levels, predisposing them to osteoarthritis
- **Higher bone density** increases the risk for osteoarthritis, decreases the risk for osteoporosis
- **Genetic factors** account for at least 50% of cases of osteoarthritis of the hands and hips (with a smaller percentage for knee osteoarthritis); some are born with defective cartilage or slight defects in the way the joints fit together
- **Lack of exercise** (the “use it or lose it” principal)
- **Joint injury** (athletic injury, sprain or strain to ligaments and tendons puts more stress on the joint itself)

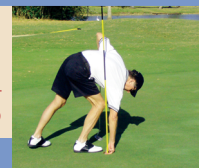
When Your Joints Are Sore



- Rest the painful joint
- Take **acetaminophen** - 500mg every 4-6 hours
- Ice pack the area to reduce inflammation

If the pain persists for more than 48 hours, call your health care provider

Diagnosing



- Physical examination shows **decreased movement** within the joint
- A history of **pain, stiffness and instability** in the joint that worsens with disuse
- X-ray will show that the spaces between the bones of the joint are smaller than they should be

Prevention



- Adequate vitamin C levels reduce the risk for osteoarthritis by 33%
- Adequate vitamin D levels will slow the progression of the disease, especially in the case of osteoarthritis of the hip
- Antioxidants provide defense against tissue injury and protect the cartilage from deterioration

Treatments for Osteoarthritis



Pharmacologic Therapy

- Hyaluronic acid injections provide a lubricating fluid to the joint; decrease the rubbing of bone on bone and reduce inflammation
- Pharmacologic therapies for pain reduction are discussed in the section on pain management

Questions To Ask Your Doctor or Pharmacist About Medicines

- How often should I take this medicine?
- Should I take this medicine with food or between meals?
- What side effects can I expect?
- Should I take this medicine with other prescription medicines I take?
- Should I take this medicine with over-the-counter medicines I take?

Non-pharmacologic Therapy

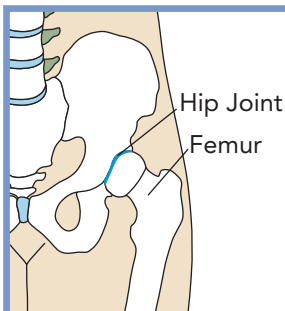
- **Physical therapy:** Promotes strength of muscle surrounding the joint; prevents further deterioration
- **Isometric exercises** increase strength
- **Weight loss:** Reduces stress on the joint, especially knee and hip joints

Surgical Therapy

- Surgery may be performed to:
 - Remove loose pieces of bone and cartilage from the joint if they are causing mechanical symptoms (buckling or locking)
 - Resurface (smooth out) bones
 - Reposition bones
 - Replace joints

Arthroplasty:

- The process that removes the cartilage debris resulting from osteoarthritis
- Highest success rate in knee osteoarthritis
- Also removes rough surfaces of bone spurs that accumulate late in osteoarthritis and removes inflamed parts of the synovium
- Can reduce pain and inflammation, but does not stop the progression of osteoarthritis
- Joint replacement
 - Goal is to relieve the pain in the joint caused by osteoarthritis to the cartilage - the pain from the loss of cartilage and inflammation may be so severe, a person will avoid using the joint, weakening the muscles around the joint and making it even more difficult to move
 - Total joint replacement will be considered if other treatment options will not relieve the pain and disability
 - After the joint has been replaced, physical therapy will be essential to full recovery
 - Osteoarthritis often affects the hip joint; instability of the joint can cause persons to fall and fracture the femur; primary reason for joint replacement or stabilization at the hip



Managing the Pain



- Major **psychological** and **social** factors contribute to the pain, including depression and social isolation
- **Cognitive behavioral therapy** can be affective for osteoarthritis pain, including distraction, goal-setting and affirmations
- **Education** to modify patients' behavior, increase understanding, make informed decisions about therapy, and adhere to treatment plans
- **Total joint replacement**
- **Acetaminophen** (such as Tylenol®) for mild pain has been shown to be as effective and better tolerated as any anti-inflammatory medication
- **Non-steroidal antiinflammatory (NSAID)** medications are often prescribed for osteoarthritis; inhibit the production of prostaglandins at the cyclooxygenase (COX) enzyme (prostaglandins are responsible for the signs and symptoms of inflammation, including pain)
- **Tramadol** (Ultram®) is a non-narcotic analgesic used alone or with acetaminophen; a combination of tramadol and acetaminophen, called Ultracet®, acts quickly and has a longer duration than Ultram® alone. Tramadol has few side effects and will not cause constipation.
 - **Tramadol should not be taken by persons who have experienced a seizure or are at risk for seizure.**
- When other pain relief measures are ineffective, **narcotic analgesics** may be necessary
 - Morphine, fentanyl or methadones are preferred narcotic analgesics; they have fewer side effects than codeine preparations
 - Meperidine (Demerol®) is ineffective in oral doses
- Topical agents include topical capsaicin, which depletes substance P, a pain-causing neurotransmitter

The Dangers of Non-Steroidal Anti-inflammatory Drugs (NSAIDs)

- **GI toxicity:** NSAIDs work by inhibiting the body process that produces prostaglandins (inflammation builders) but also protects the stomach lining from erosion; an estimated 16,500 elders die each year due to the GI toxicity of NSAIDs
 - COX-2 NSAIDs are selective to just the prostaglandin side of the process, so the stomach-protective side of the process stays intact; COX-2 NSAIDs are a common cause of renal failure, especially in the elderly (renal failure associated with COX-2 NSAID use produces significant mortality in this age group)
 - The NSAIDs as a group also increase blood pressure from 3-6 mmHg, increasing risk for stroke, renal disease or heart failure
 - When these drugs are prescribed by your health care provider and side effects are monitored to maintain overall health, they can be very useful
 - As with all other drugs, NSAIDs should be taken as directed
- NSAIDs cannot be used or should be used with extra caution in these cases:**
- Allergy to aspirin or any NSAID
 - During pregnancy
 - During breast feeding
 - If you are on blood-thinning agents (anticoagulants), such as coumadin
 - If there is a defect of the blood-clotting system
 - Active peptic ulcer
 - Asthma
 - Kidney impairment
 - Heart impairment
 - Liver impairment

Alternative & Complementary Therapies



All alternative and complementary therapies should be discussed with your health care provider before use

- While most are safe and effective, some may interfere with other medications or cause undesirable side effects
- It is important to make sure providers of some therapies (like acupuncture and massage) are certified

Acupuncture

A traditional Chinese medicine involving stimulation of special points on the body

- Fine needles are used to stimulate 360 acupuncture points in the body
- Between four and 10 needles are normally used at each session
- Studies show acupuncture can relieve certain conditions; according to traditional Chinese medicine, the body is controlled by a life force known as "Qi," and acupuncture points are used to change the flow of Qi that has been disrupted by illness
- Acupuncture has proven an effective tool for osteoarthritis pain and inflammation

Glucosamine

In clinical studies, the use of glucosamine reduced pain and reduced the need for NSAIDs and other analgesic medications

Chondroitin

A combination of molecules found in cartilage; the use of oral chondroitin may decrease osteoarthritis pain and reduce the need for other analgesic medications

Massage

Reduces musculoskeletal pain of osteoarthritis and surrounding muscles while increasing the relaxation response, reducing the levels of substance P and pain-inducing neurotransmitters

- Increases the level of endorphins (the body's natural pain relievers) in the body



Herbal Therapies

Angelica root compress: Add five drops of the oil to a hot bath to reduce muscle spasms

Boswellia: Anti-inflammatory

Castor oil hot packs: Apply to affected joints for pain relief

Cayenne (capsaicin): Used topically to relieve arthritis pain

Celery seed: Anti-inflammatory

Cherries, hawthorn berries and blueberries: Contain anthocyanidins and proanthocyanidins, flavonoids that enhance collagen and the structure of joints

Devil's claw (*Harpagophytum procumbens*): Analgesic, anti-inflammatory; dosage 1-2 grams three times daily

Fenugreek packs: For acute inflammation, place seeds in a warm, moist compact surrounding the area

Ginger (*zingiber officinale*): Anti-inflammatory; dosage 0.5 – 1 mg of powdered ginger daily

Phytodolor (*populus tremula, fraxinus excelsior and solidago virgaurea*): Anti-inflammatory; shown to reduce pain of osteoarthritis as well as low doses of NSAIDs

Turmeric (*curcumin longa*): Anti-inflammatory; dosage 400 mg three times daily

White willow: Anti-inflammatory and pain-relieving effects; slow-acting but as effective as aspirin; patients should take enough to equal 100 mg of salicin (the active ingredient in white willow) per day

Yucca: Pain relief

See QuickStudy® guides **Vitamins & Minerals** and **Herbal Therapy** for more information on natural remedies



Further Information

The following are reputable and well-developed sites that provide information that has been studied and found to be helpful for osteoarthritis

National Institute for Arthritis and Musculoskeletal and Skin Disease NIAMS Information Clearing House

1 AMS Circle
Bethesda, Maryland 20892-3675
(301) 495-4484
Fax: (310) 718-6366
<http://www.niams.nih.gov>

American College of Rheumatology/Association of Rheumatology Health Professionals

1800 Century Place
Suite 250
Atlanta, GA 30345-4300
(404) 633-3777
Fax: 404-633-1870
<http://www.rheumatology.org>

Arthritis Foundation

P.O. Box 7669
Atlanta Georgia 30357-0669
1-800-283-7800; you may want to check your directory for a local chapter
Fax: 404-872-0457
<http://www.arthritis.org>

For more information on health and aging, contact:

National Institute on Aging Information Center

P.O. Box 8057
Gaithersburg, MD 20898-8057
1-800-222-2225
<http://www.niapublications.org>

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