



Osteonecrosis

The bones and bone marrow of the human body are made up of living cells that need a steady blood supply to stay healthy. If blood flow to these cells greatly decreases, the cells may die, causing the bone to collapse. This process is called *osteonecrosis*. Osteonecrosis can lead to pain, arthritis and limited use of affected joints. Some people may even need joint replacement surgery.

Fast facts

- Osteonecrosis can cause severe pain and disability, much like arthritis does.
- More than 90 percent of cases of osteonecrosis result from use of glucocorticoid (sometimes called corticosteroid) medicine or from drinking too much alcohol.
- Though osteonecrosis can occur in almost any bone of the body, the hips, knees and shoulders are the most common sites affected.
- It is easier to prevent osteonecrosis than it is to treat it.
- The cause and treatment for osteonecrosis of the jaw differs from that for osteonecrosis found elsewhere.



What is osteonecrosis?

Osteonecrosis, which is also called *avascular necrosis* or *aseptic necrosis*, is the death of bone cells due to decreased blood flow. It can lead to pain and collapse of areas of bone. This collapse of bone, in turn, can lead to degenerative arthritis (also called [osteoarthritis](#)) of nearby joints, most often the hips and knees. Less often affected spots are the shoulders, hands and feet.

Rarely, osteonecrosis can occur in the jaw. This can result in ulcers (sores) of gum tissue, exposed jaw bone and pain.

What causes osteonecrosis?

The most common causes of osteonecrosis are:

- Serious trauma (injury), which interrupts a bone's blood supply
- Corticosteroid medications (such as prednisone, cortisone or methylprednisolone), mainly when used for a long time or at a high dose
- Excess alcohol consumption

Other less common risk factors for osteonecrosis include:

- [Lupus](#)
- Decompression disease (also called the "bends" that occur with scuba diving)
- Blood disorders such as sickle cell anemia
- [HIV infection](#) (the virus that causes AIDS)
- Radiation therapy
- Bisphosphonates, which are linked to [osteonecrosis of the jaw](#)

Who gets osteonecrosis?

Most of the 10,000 to 20,000 Americans who develop osteonecrosis each year are between the ages of 20 and 50. These people most often have a history of serious trauma, corticosteroid use, excess alcohol intake or one of the other risk factors listed in "What causes osteonecrosis?"

Osteonecrosis of the jaw may occur as a rare complication of treatment with medications called *bisphosphonates*. It mainly occurs in patients with certain types of cancer who are receiving frequent doses of intravenous (often called IV) bisphosphonates such as zoledronate or pamidronate. Most often, this problem occurred in people who recently had a dental procedure or had dental disease.

How is osteonecrosis diagnosed?

Doctors suspect osteonecrosis when a person with risk factors for it feels bone pain that is "localized" (limited to a small area). Patients with hip pain due to osteonecrosis often feel pain in the groin. Pain due to hip or knee osteonecrosis is most often worse with weight-bearing or walking.



The next step in diagnosis is to get an X-ray of the painful area. Because these X-rays may look normal in the early stages of disease, your doctor may schedule other imaging studies. These include bone scans or magnetic resonance images (often referred to as MRIs). MRI is excellent at helping detect very early osteonecrosis.

Osteonecrosis of the jaw is found by seeing exposed bone during an exam of the mouth.

How is osteonecrosis treated?

Unfortunately, there is no clear proof showing the best way to treat osteonecrosis, but starting treatment early—before collapse of bone—is best.

Early treatment. Often, treatment starts with pain medications and by limiting weight-bearing (such as walking) on affected areas. This type of conservative treatment may work well for patients with early osteonecrosis in small areas of bone. Yet, it does not work for those with hip or knee osteonecrosis who are facing worsening disease and bone collapse.

Instead, these patients may need surgical procedures to relieve pain and try to prevent bone collapse.

Surgery. Patients whose osteonecrosis is getting worse may need a procedure called *core decompression*. It removes a piece (core) of bone from the affected area, to try to improve blood flow.

More advanced cases may need a procedure called *osteotomy*. During this operation, surgeons remove dead bone and re-position the remaining bone so that healthy bone supports the weight-bearing joint surface.

If bone collapse at the joint has already occurred, these patients often need total [joint replacement](#) (*arthroplasty*) of the hip or knee. This operation should improve pain and function.

Another surgery option for advanced cases is bone *grafting*. This involves taking a small piece of a person's own healthy leg bone and grafting (transplanting) it to the area of dead bone. Bone grafting improves blood flow and support of the surrounding bone.



Surgical procedures may be done to relieve pain and try to prevent bone collapse.



Medicine. There is no proven medical therapy for osteonecrosis. Some studies suggest that short-term bisphosphonate treatment may slow, improve or even prevent bone collapse. Yet, anyone with osteonecrosis of the jaw should stop taking bisphosphonates.

Treatment of jaw osteonecrosis. Most cases of osteonecrosis of the jaw improve with conservative treatment. This includes limited débridement (removing dead tissue) and use of antibiotics and medicated mouthwash.

Prevention

The key ways to prevent osteonecrosis are to avoid too much alcohol intake and avoid tobacco use, as smoking also raises the risk of osteonecrosis. Also, if you have to take corticosteroids, such as prednisone, work with your doctor to take the smallest dose for the shortest time possible that will control your symptoms.

Prevent osteonecrosis of the jaw with good dental hygiene. If you need any dental work, complete that before starting bisphosphonate treatment or as soon afterward as possible. See your dentist right away if you have any sign of dental infection (jaw pain or pain, swelling or redness of the gums).

Living with osteonecrosis

Some people will develop osteoarthritis (also called degenerative arthritis or “wear and tear” of the joints) as a result of osteonecrosis. Working with a physical therapist on an exercise program may be helpful in treating the pain and stiffness from osteoarthritis.

Points to remember

- Work closely with your health care provider to limit corticosteroid use.
- Limit alcohol intake.
- Early diagnosis and early treatment may improve the outcome.

The role of the rheumatologist in treating osteonecrosis

Rheumatologists are doctors who are experts in diagnosing and treating diseases of the joints, muscles and bones. Thus, they are qualified to make a proper diagnosis of osteonecrosis. They can also advise patients about the best treatment options.

To find a rheumatologist

For more information about rheumatologists, [click here](#).

For a listing of rheumatologists in your area, [click here](#).

For more information

The American College of Rheumatology has compiled this list to give you a starting point for your own additional research. The ACR does not endorse or maintain these Web sites, and is not responsible for any information or claims provided on them. It is always best to talk with your rheumatologist for more information and before making any decisions about your care.



MedlinePlus (National Institutes of Health)

www.nlm.nih.gov/medlineplus/osteonecrosis.html

National Institute of Arthritis and Musculoskeletal and Skin Diseases Information Clearinghouse

www.niams.nih.gov/health_info/osteonecrosis

American College of Rheumatology Research and Education Foundation

Learn how the ACR Research and Education Foundation advances research and training to improve the health of people with rheumatic diseases.

www.rheumatology.org/REF

Updated April 2012

Written by Susan Hylland, MD, and reviewed by the American College of Rheumatology Communications and Marketing Committee.

This patient fact sheet is provided for general education only. Individuals should consult a qualified health care provider for professional medical advice, diagnosis and treatment of a medical or health condition.

© 2012 American College of Rheumatology