

Osteonecrosis, Osteopenia, and Osteoporosis

What is osteonecrosis, and what are its symptoms?

Osteonecrosis means "bone death." Bone can die if its blood supply is cut off and it can't get the right nutrients; this is called *avascular necrosis*.

Osteonecrosis has been observed in the hip bones of some people with HIV, but doctors aren't sure why it occurs. It is not clear if osteonecrosis occurs because of HIV infection itself or as a side effect of the medications used to treat HIV.

Symptoms of osteonecrosis include:

- pain in the affected area of the body
- limited range of motion, joint stiffness, or limping
- muscle spasms
- progressive bone damage leading to bone collapse

How is osteonecrosis diagnosed?

If you have symptoms of osteonecrosis, early diagnosis is best made by **magnetic resonance imaging (MRI)** of the bone. MRI is able to detect osteonecrosis before bone is significantly damaged and before abnormalities can be seen on an x-ray. X-rays and CT scans may also be used to look for osteonecrotic bone damage.

What is the treatment for osteonecrosis?

While some treatments may provide relief from the pain associated with osteonecrosis, surgical removal of the dead bone and joint replacement are the only effective treatments for people who have serious osteonecrosis. If you are diagnosed with osteonecrosis, you may benefit from:

- Surgery – options range from minor outpatient procedures to reinforce bone, to partial or total hip replacement.

Terms Used in This Fact Sheet:

Dual energy x-ray absorptiometry (DEXA) scan: a test that uses low energy x-rays to measure the mineral content of bones. A DEXA scan uses less radiation than a standard chest x-ray.

Magnetic resonance imaging (MRI): a way to take pictures of the inside of the body. MRI uses magnetic fields and radio waves instead of x-rays. MRIs are particularly useful for taking pictures of the body's soft tissues and organs.

Protease inhibitor (PI): class of anti-HIV medication. PIs work by blocking protease, a protein that HIV needs to make copies of itself. The PIs approved by the FDA are Agenerase, Crixivan, Fortovase, Invirase, Kaletra, Lexiva, Norvir, Reyataz, and Viracept.

- Medications – **non-steroidal anti-inflammatory drugs (NSAIDs)** such as aspirin or ibuprofen may decrease the pain of osteonecrosis.
- Assistive devices – canes, crutches, or a walker may lessen the pain associated with bone disorders and may reduce the risk of falls.

What are osteopenia and osteoporosis, and what are their symptoms?

Bones are made of minerals like calcium and phosphate. *Osteopenia* is a condition in which the bones lose these minerals and become less dense. This makes the bones weaker. When bone loss becomes more severe, the condition is referred to as *osteoporosis*.

There are no obvious symptoms in the early stages of osteopenia and osteoporosis. However, fractures may occur if bone loss continues. The most common fractures involve the spine, wrists, or hips. Fractures may cause:

- neck or low back pain
- bone pain or tenderness
- loss of height
- stooped posture

Osteonecrosis, Osteopenia, and Osteoporosis (continued)

Who is at risk of developing osteopenia and osteoporosis?

Anyone can develop osteopenia and osteoporosis. You may be at increased risk if you take HIV **protease inhibitors (PIs)**. You may also be at increased risk if you:

- are female
- take steroids or certain other medications
- smoke
- drink excessive amounts of alcohol
- have low body weight

Anti-HIV medications can cause negative side effects that may increase your risk of osteopenia and osteoporosis. These side effects include:

- *Lipodystrophy* (also known as fat maldistribution) – a disturbance in the way the body produces, uses, and distributes fat (see [Lipodystrophy Fact Sheet](#))
- *Hyperlipidemia* – high levels of cholesterol and triglycerides in the blood (see [Hyperlipidemia Fact Sheet](#))

How are osteopenia and osteoporosis diagnosed?

A **dual energy x-ray absorptiometry (DEXA)** scan is used to diagnose osteopenia and osteoporosis. A DEXA scan is a painless, noninvasive procedure to determine your bone mineral density. Your bone density is then compared to people of your age and health to determine if your bones are weaker than they should be.

Although there are currently no specific guidelines for how often HIV positive people should have a DEXA scan, you should talk with your doctor about your risk factors for osteopenia and osteoporosis.

What are the treatments for osteopenia and osteoporosis?

If you are diagnosed with osteopenia or osteoporosis, you may benefit from:

- Dietary supplements – Calcium and vitamin D supplements are often recommended for people with osteopenia and osteoporosis.
- Medications – Bisphosphonates (Fosamax and Actonel) and raloxifene (Evista) are prescription drugs used to prevent and treat osteoporosis. Calcitonin (Miacalcin and Calcimar) and hormone replacement therapy for post-menopausal women may also be prescribed to slow bone loss and reduce the risk of fractures.
- Assistive devices – Canes, crutches, or a walker may lessen the pain associated with osteoporosis and reduce the risk of falls.

How can I prevent bone disorders from occurring?

Some things you can do to lower your risk of bone problems:

- Consume adequate calcium and vitamin D in your diet – High-calcium foods include low-fat milk, yogurt, and leafy green vegetables. Calcium supplements with vitamin D are another source of calcium. Adults should consume 1,000 to 1,500 mg of calcium each day.
- Get weight-bearing exercise – Walking, jogging, playing tennis, dancing, and other physical activities strengthen bone.
- Don't drink excessive alcohol or smoke – These behaviors accelerate bone loss.
- Prevent falls – Bone breaks or fractures increase your risk of osteonecrosis.

For more information:

Contact your doctor or an *AIDSinfo* Health Information Specialist at 1-800-448-0440 or <http://aidsinfo.nih.gov>.