Osteoporosis

Osteoporosis is a disease characterized by deterioration of bone tissue and loss of bone strength. The condition can progress over time and cause bone to become increasingly porous and weak and break more easily.

Your doctor may use x-ray, body CT, spine CT or a bone density scan to help diagnose your condition and assess your risk for fracture. Osteoporosis may cause vertebral compression fractures in the spine; if painful, these fractures may be treated with vertebroplasty or kyphoplasty.

What is osteoporosis?

Osteoporosis is a disease characterized by deterioration of bone tissue with loss of bone strength. Osteoporosis can progress over time. This can cause the bone to become increasingly porous (http://www.radiologyinfo.org) (as the name of the disease would suggest) and to break more easily. When viewed microscopically, healthy bone looks somewhat like a honeycomb. In cases where osteoporosis is present, the holes and spaces in the honeycomb appear much bigger than those found in a healthy bone.

Women and older adults are more at risk for developing osteoporosis. Heredity, low body weight, smoking, and chronic use of certain medications (such as steroids) are also risk factors for the disease.

Lifting, bending, bumping into furniture and even sneezing can cause a bone to break in people affected by osteoporosis. Fractures (http://www.radiologyinfo.org) of the hip, spine or wrist are most common, but other bones are also susceptible to breaks.

Osteoporosis can be present for years without any noticeable symptoms, but signs can include:

- Severe back pain
- Loss of height over time
- A stooped posture
- Bone fractures from minor injury

How is osteoporosis diagnosed and evaluated?

To diagnose osteoporosis and assess your risk of fracture and determine your need for treatment, your doctor will most likely order a bone density scan (https://www.radiologyinfo.org/en/info/dexa) .

This exam is used to measure bone mineral density (BMD). It is most commonly performed using dual-energy x-ray absorptiometry (DXA or DEXA) or bone densitometry (http://www.radiologyinfo.org) . The amount of x-rays absorbed by tissues and bone is measured by the DXA machine and correlates with bone mineral density.

The DXA machine converts bone density information to your T score and Z score. The T score measures the amount of bone you have in comparison to a normal population of younger people and is used to estimate your risk of developing a fracture and need for drug therapy. Your Z score measures the amount of bone you have in comparison to those in your age group. This number can

help indicate whether there is a need for further medical tests.

The following procedures can be performed to determine bone fractures due to osteoporosis:

- Bone x-ray (https://www.radiologyinfo.org/en/info/bonerad) *:* Bone x-ray produces images of bones within the body, including the hand, wrist, arm, elbow, shoulder, foot, ankle, leg (shin), knee, thigh, hip, pelvis or spine. It aids in the diagnosis of fractured bones, which are sometimes a result of osteoporosis.
- CT scan of the spine (https://www.radiologyinfo.org/en/info/spinect) *:* CT scanning of the spine is performed to assess for alignment and fractures. It can be used to measure bone density and determine whether vertebral fractures are likely to occur.
- MRI of the spine (https://www.radiologyinfo.org/en/info/spinemr) *:* Magnetic resonance imaging of the spine is performed to evaluate vertebral fractures for evidence of underlying disease, such as cancer, and to assess if the fracture is old or new. New fractures usually demonstrate a better response to treatment by vertebroplasty and kyphoplasty (https://www.radiologyinfo.org/en/info/vertebro) .

How might osteoporosis be treated?

There are many FDA-approved medications to choose from for the treatment of osteoporosis including:

- bisphosphonates
- calcitonin
- hormone therapy
- RANK ligand inhibitor
- selective estrogen receptor modulators (SERMs)
- parathyroid hormone analog.

A prescription is required for these medications and medical evaluation is required before treatment.

Compression fractures in the vertebra can occur as a result of osteoporosis. In these cases, vertebroplasty and kyphoplasty, performed by a radiologist, may be an option to treat painful spine fractures. With vertebroplasty, image guidance is used to inject a special cement mixture through a hollow needle into the fractured bone. In kyphoplasty, a balloon is inserted through the needle into the fractured bone to create a cavity. Once the balloon is removed, a cement mixture is injected into the cavity.

In some cases of compression fracture, surgical treatment may be required, especially if there is evidence of severe narrowing of your spinal canal.

Which test, procedure or treatment is best for me?

- *Inflammatory Back Pain - Known or Suspected Axial Spondyloarthritis (https://www.radiologyinfo.org/en/info/acs-inflammatory-back-pain)*
- *Low Back Pain (https://www.radiologyinfo.org/en/info/acs-low-back-pain)*
- *Osteoporosis and Bone Mineral Density (https://www.radiologyinfo.org/en/info/acs-osteoporosis-and-bmd)*

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