

# Osteopenia and Osteoporosis

Arlene Evans-De Beverly, PA-C

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**What is osteopenia and how is it related to osteoporosis?** To begin to answer that question, we must define osteopenia. Osteopenia is the thinning of bone mass. While this decrease in bone mass is not usually considered "severe", it is considered a serious risk factor for the development of osteoporosis. The difference between osteopenia and osteoporosis is the measure of bone mineral density.

Osteoporosis, the "fragile bone disease," is characterized by a loss of bone mass caused by a deficiency in calcium, vitamin D, magnesium and other vitamins and minerals.

Osteoporosis can lead to loss of height, humpback, fractures and long term pain.

According to the National Osteoporosis Foundation (NOF), osteoporosis affects at least 10 million Americans, mostly women. Thirty-four million more Americans are estimated to have developed osteopenia (low bone mass), putting them at risk for osteoporosis.

## What are the risk factors for osteoporosis?

In young healthy adult women, bones reach their greatest strength around ages 20 to 35 years of age. After that, bones tend to slowly become weaker as you get older.

The risk of osteoporosis increases with age. Osteoporosis is more common in women after menopause. Women have less bone mass than men and lose bone mass earlier and more rapidly than men. After menopause women produce much less of the hormone estrogen. Estrogen helps women's bones stay strong. Low levels of estrogen can lead to lowered bone density.

Osteoporosis is most common in Caucasian and Asian women, especially if they have a small frame and are slender, but it can occur in women of any race. In any given ethnic group, older women have about twice the risk for osteoporosis as older men. Women are also at higher risk if there is a family history of osteoporosis.

In addition to aging, some other causes of osteoporosis are:

- Low levels of vitamin D
- Current cigarette smoking
- Low body weight
- Long term use of certain drugs such prednisone, heparin, some but not all anti-seizure drugs and the very commonly used medications to treat acid reflux disease (examples are Nexium and Previcid)
- Medical conditions that impair absorption of nutrients
- Overly active thyroid or parathyroid glands
- Alcoholism
- Severe liver disease
- Kidney failure
- Too little calcium in the diet
- Inadequate weight-bearing exercise such as walking, dancing, or weight lifting
- Intense exercise (such as marathon running), which reduces estrogen levels
- Long periods of bed rest during serious illness, which speeds up the loss of calcium from bones
- Eating disorders or too much dieting which can result in low calcium intake and/or low estrogen levels

### **How does it occur?**

Bone density in later life depends on peak mass achieved in youth and, later on, the rate of bone loss. Bone mass is the highest in your 30s and depends mainly on diet (calcium and vitamin D), physical activity, and genetics. Although we all have gradual decline in bone density after middle age, most women during the first few years after menopause have a faster rate of bone loss.

### **What are the symptoms?**

You may have no symptoms until a bone breaks. Broken bones are the most common problem for people with osteoporosis. Often it's the hip, arm, or wrist that breaks. If you want to prevent or treat osteoporosis, the goal is to avoid fracture.

All bones can be affected by osteoporosis, but the worst osteoporotic fractures occur in the vertebrae of the spine and in the hip. Vertebral fractures can cause back pain, loss of height, curved spine, and stooped posture. Many vertebral fractures do not, however, cause any pain. A hip fracture almost always requires hospitalization and surgery. About half of women who have a hip fracture spend at least some time in a nursing home. About half of those (or a quarter of women with hip fractures) require long term nursing care. One in five persons who have an osteoporotic hip fracture die within the following year as a result of complications caused by the hip fracture.

### **How is it diagnosed?**

Your health care provider may suspect that you have osteoporosis based on your risk factors, loss of height, or even from an x-ray taken for some other problem. There are no practical methods to assess overall bone strength, but bone mineral density (which can be measured) accounts for about 70% of bone strength and is currently the recommended method of predicting fracture risk.

A PIXI (Peripheral Instantaneous X-ray Imaging) screening test of the heel or wrist may provide helpful information about bone density. It is generally considered to be more accurate in women who are less than 65 years of age. If the PIXI is abnormal, a DEXA [Dual Emission X-ray Absorptiometry] diagnostic test of the spine and/or hip is most often used and is a better test to predict bone mineral density. A DEXA scan uses x-rays, but instead of creating a picture by exposing film, it uses a detector and a computer to calculate bone density. The test is painless and typically takes less than 10 minutes. The radiation exposure per site tested is approximately the same as that in daily background radiation.

Among several numbers produced from a DEXA scan, T-scores are most often used for interpretation. A T-score compares your bone density to that of healthy young adult:

#### **T-score What the score means**

2.5 to -1 is Normal bone density

Between -1 and -2.4 is Osteopenia (low bone density)

-2.5 and below is Osteoporosis

Osteopenia suggests moderate fracture risk and osteoporosis suggests high fracture risk. Deciding when and how to treat depends both on an individual's T-score and risk factors.

### **How is it prevented and treated?**

To maintain good bone health and prevent osteoporosis you should eat a balanced diet that includes adequate calcium and vitamin D (using supplements when necessary), engage in regular physical activity, refrain from smoking, limit caffeine and avoid carbonated beverages. Heavy alcohol use (maximum 1 drink/day for women or 2 drinks/day for men) can also harm the bones. It is important to consume enough calcium and vitamin D throughout your life, in order to achieve maximal peak bone density in early and middle years and to maintain bone in later years. For most adults, a daily intake of calcium 1200 and 1500 mg, Vitamin D<sub>3</sub> 1000 IU to 2000 IU and magnesium 400 mg is

both safe and effective. It is important to know that your body can not absorb more than 500 mg to 600 mg of calcium at one time. Divide your calcium supplements into two or three doses spread throughout the day. Weight-bearing exercise, such as walking or stair climbing, also helps keep your bones strong.

### **What medications are used?**

If you have low bone density but not osteoporosis, a medication to reduce risk of developing osteoporosis and fracture may be prescribed. Most treatments do not cure osteoporosis but can slow down the loss of bone and may cause an increase in bone density. One treatment that is available actually builds new bone. The goal of treatment is to avoid fracture. You should continue (or begin) to consume adequate amounts of calcium and vitamin D and magnesium. To further reduce risk of fracture your health care provider may suggest a medication, although the exact recommendation will depend on your situation.

### **How long will the effects last?**

The risk of a broken bone resulting from osteoporosis increases with age. Once menopause begins, most women, especially Caucasian and Asian women, need to take precautions for the rest of their lives to prevent osteoporosis.

### **If I have osteoporosis, what can I do to reduce my risk of injury?**

You can reduce the risk of injury and broken bones if you:

- Increase your activity level gradually (but avoid unusually high impact sports)
- Wear supportive shoes with low heels and non-slippery soles
- Use support for walking, such as a cane, if you need it
- Maintain a safe, well-lit, and uncluttered home to help prevent falls
- Avoid throw rugs on your floors at home
- Avoid icy, wet, or slippery surfaces, especially in the bathroom
- Use nonskid mats in the shower and bathtub

### **Where can I get more information about osteoporosis?**

Osteoporosis and Related Bone Diseases National Resource Center (ORBD-NRC)  
1232 22nd Street, NW  
Washington, DC 20037-1292  
Phone: (202) 223-0344  
Toll-free: (800) 624-BONE (2663)

E-mail: [orbdnrc@nof.org](mailto:orbdnrc@nof.org)  
<http://www.osteoporosis.org/>  
National Osteoporosis Foundation  
1232 22nd Street NW  
Washington, DC 20037-1292  
Phone: (202) 223-2226  
E-mail: [patientinfo@nof.org](mailto:patientinfo@nof.org)  
<http://www.nof.org/>  
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