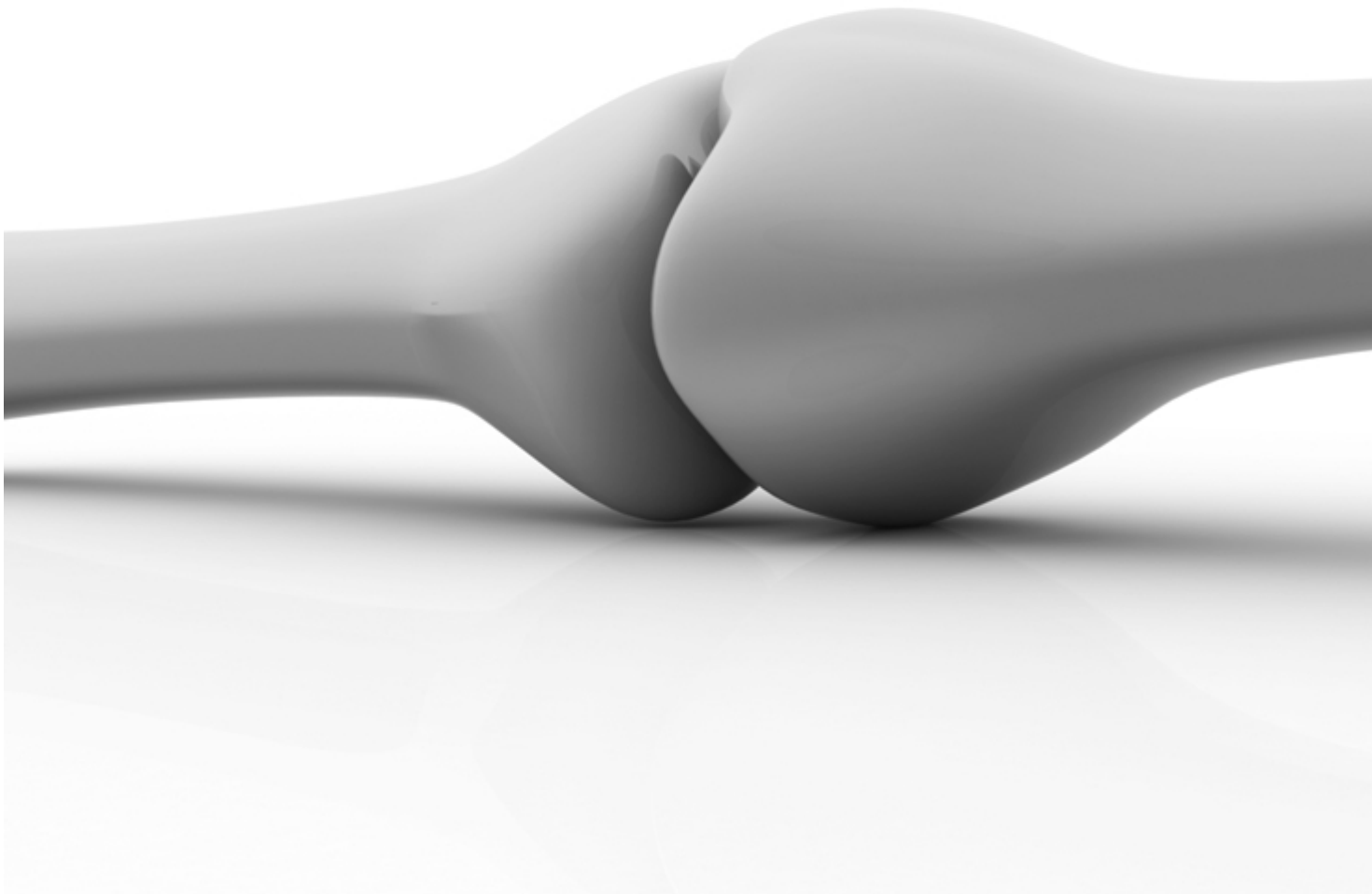


## Bone Health <sup>[1]</sup>

Submitted on Jun 20, 2014



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## The Importance of Healthy Bones

Bones play many important roles in your body. They support you and help you move. They protect your brain, heart, and other organs from injury. Bones also store minerals such as calcium and phosphorus.

Bones are living tissue and change during your life. Every day, your body removes old bone and adds new bone in its place. In young people, more bone is added than removed. After age 30, more bone is removed than added. This makes the bones lighter and more fragile, putting them at greater risk for injury.

Many people have weak bones and do not know it. This is because bone loss often happens over a long period of time and does not hurt. For many people, a broken bone is the first sign that their bones have weakened. Bone weakness is often talked about in terms of low bone mass or low bone density. Bone mass or bone density refers to how much internal bone structure is in a given section of bone. More dense bone, for example, has more calcium and phosphorus ? two key minerals that make up bone ? per square inch of bone.

## Bone Loss and HIV

Bone loss and weakened bones occur more often in people living with HIV (HIV+). Experts are not exactly sure why. It could be due to HIV itself, HIV drugs, or HIV+ people getting older. There are three bone conditions which HIV+ people are more likely to get:

### Osteopenia

Osteopenia is caused by a loss of bone minerals that leads to lower-than-normal bone density. Most often, osteopenia has no symptoms. The only way to know if you have this condition is to get a bone density test done. If you do find you have osteopenia, there are things you can do (see below) to stop it and possibly even reverse it.

Having osteopenia does not mean that you will definitely develop osteoporosis; however, it does mean that you are more likely to develop it. Although bone loss with osteopenia is generally less severe than with osteoporosis, it does indicate that bones are weaker and may be more likely to break.

## Osteoporosis

Osteoporosis is a more serious condition than osteopenia, and refers to a loss of bone density and bone mass. Over time, breaking down more bone than is put back causes lower bone density, also called bone mineral density, which means there are lower-than-normal levels of minerals in the bones. Bones become weak and are more likely to break. People with osteoporosis most often break bones in the wrist, spine, and hip, and often break bones without having an injury to cause the break.

## Osteonecrosis (avascular necrosis)

Osteonecrosis means bone death. It is caused by a loss of blood supply to the bone. Osteonecrosis may cause pain at the affected joint. It usually affects the head of the femur, the ball-shaped part of the thigh bone that connects it to the hip.

## Risk Factors

In addition to HIV and HIV drugs, there are other things that can put you at risk for bone loss:

### Risk factors you can control

- Diet [2]: Getting too little calcium and vitamin D
- Physical activity [3]: Not being physically active, especially not doing weight-bearing or resistance activities
- Body weight: Being too thin
- Tobacco use [4]: Smoking, using snuff, or chewing tobacco
- Alcohol and coffee intake: Drinking a lot of alcohol [5] and/or caffeine
- Testosterone levels: Low testosterone levels in men
- Use of certain medicines: Long-term use of medicines including Depo-Provera (an injectable form of birth control), glucocorticosteroids (drugs such as prednisone and cortisone), thyroid hormones, anticonvulsants (anti-seizure medications), heparin, pentamidine, and ketoconazole

### Risk factors you cannot control

- Age: Your chances of getting osteoporosis increase as you get older
- Gender: Women have a greater chance of getting osteoporosis
- Menopause [6]: Women lose bone due to hormone changes that happen after menopause. While hormone replacement therapy is no longer routinely recommended, it is an effective therapy for bone loss that does not respond to other treatments.
- Ethnicity: Mexican American, non-Hispanic white, and Asian women are at higher risk; African-American women are also at risk, but less so

## How to Know if You Have Bone Problems

### Osteoporosis and Osteopenia

Bone mineral density (BMD) tests are the only way to find out if you have osteoporosis or osteopenia. The most widely used BMD test is a DEXA (Dual Energy X-ray Absorptiometry)

scan. The DEXA scan is a kind of x-ray, and is an easy and painless test that takes about 15 minutes.

## Osteonecrosis

Osteonecrosis can cause pain in the joints, usually in the hip area. At first the pain may only occur when you put weight on the joint. In more severe cases the pain can be constant. An MRI (magnetic resonance imaging) scan can spot early stages. X-rays and other scans can detect advanced osteonecrosis.

## Diet and Healthy Bones

Even though you cannot control all of the things that lead to bone disease, you can control your [diet](#) [2]. The [mineral](#) [7] calcium makes up a large part of your bones. This means that if you do not get enough calcium in your diet, your bones may get weaker.

Calcium is found naturally in some foods, and it is added to others. Some foods that contain calcium are:

- Dairy products, including milk, yogurt, and cheese
- Soy products: tofu, tempeh, soy milk
- Seeds: sesame seeds, chia seeds, and flax seeds
- Dark leafy greens: spinach, kale, chard, collard greens, turnip greens
- Broccoli
- Beans: black beans, navy beans
- Dried fruits and nuts: figs, almonds, brazil nuts
- Oranges and orange juice (especially calcium-fortified orange juice)
- Salmon or sardines with the bones

Some HIV+ people still need to take calcium pills every day even if their diet includes foods with calcium in them. A registered dietitian or other trained health care provider can help you decide if you should take calcium supplements. If you do take calcium supplements, it may be a good idea to take calcium pills with vitamin D in them, since your body cannot use calcium without vitamin D. According to the Office of Dietary Supplements at the National Institutes of Health, the recommended dietary allowances are:

- Girls and young women nine to 18 years old need 1,300 mg of calcium and 600 IU of vitamin D daily
- Women 19 to 50 need 1,000 mg of calcium and 600 IU of vitamin D daily
- Women 50 to 70 need 1,200 mg of calcium and 600 IU of vitamin D daily
- Women 71 and over need 1,200 mg of calcium and 800 IU of vitamin D daily
- Pregnant and breastfeeding teens need 1,300 mg of calcium and 600 IU of vitamin D daily
- Pregnant and breastfeeding adults need 1,000 mg of calcium and 600 IU of vitamin D daily

Talk to your health care provider before taking any [supplements](#) [7] and do not take more than these amounts unless instructed to by your health care provider.

## Physical Activity and Healthy Bones

If you do not have joint pain, it is important to be physically active [3] on a regular basis. When you exercise your muscles pull against your bones, which helps keep your bones healthy and strong. The best kind of physical activities to keep your bones strong are activities that use weight or resistance such as:

- Walking (you can use ankle weights)
- Working out with weights or weight machines
- Stair climbing
- Hiking
- Aerobics
- Jogging

If you cannot do high-impact weight-bearing activities, try lower-impact ones. For example, try walking or stair climbing instead of jogging. If you have not exercised regularly for a while, check with your health care provider before beginning a new exercise program.

Once you have your health care provider's approval, start your exercise routine slowly. Every week or two, make your routine five minutes longer. In the end, it is recommended that you do 150 minutes of moderate-level physical activity each week (e.g., five 30-minute workouts).

## Drugs to Treat Osteoporosis

Diet and exercise are best for keeping bone loss from occurring. They can also be helpful if you already have osteopenia or osteoporosis, but in some cases, your health care provider may also recommend treatment with medication.

Make sure to ask your health care provider about how to take the medication, possible side effects, and whether there are any interactions with HIV drugs you take. Some of the osteoporosis medications that are commonly used include:

### Bisphosphonates

These drugs are widely used to treat and prevent osteoporosis. They include:

- Fosamax (alendronate)
- Boniva (ibandronate)
- Actonel or Atelvia (risedronate)
- Zometa, Zomera, Aclasta and Reclast (zoledronic acid)

It is important to get enough calcium and vitamin D when you are taking a bisphosphonate.

### Hormones

- Estrogen: In women, replacing the hormone estrogen has shown to decrease the number of fractures. Sometimes estrogen is combined with another hormone called

progesterone. However, estrogen replacement therapy can increase the risk of developing other diseases, including certain cancers. Because of this, the US Food and Drug Administration (FDA) recommends using other osteoporosis medications. If estrogen/progesterone are used, the lowest possible doses should be considered.

- Testosterone: Testosterone therapy may be useful to slow or reverse decreased bone density and strength in men
- Miacalcin (calcitonin): This naturally occurring hormone slows bone loss and increases bone density in the spine
- Forteo (teriparatide): Forteo is a parathyroid hormone that has been shown to rebuild bone and increases bone mineral density, especially in the spine

## Selective Estrogen Receptor Modulators (SERMs)

Evista (raloxifene) is in a class of osteoporosis drugs called SERMs. Evista was developed to work like estrogen therapy, but with fewer side effects [8].

## Protect Your Bones

It is important that HIV+ women, especially those who have gone through menopause [6], pay careful attention to their bone health. Speak to your health care provider and follow these steps to help protect your bones:

- Ask your health care provider if you need a DEXA scan
- Follow a diet with plenty of calcium and vitamin D
- Seek the advice of a registered dietitian if you need help choosing the right foods
- Take calcium supplements if needed (talk to your health care provider first)
- Ask your health care provider what physical activity is safe for you, and start doing it
- Stop smoking and reduce your intake of caffeine and alcohol
- Tell your health care provider if you are experiencing joint pain, especially in the hip area

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## Additional Resources

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