

Pillars

of strength

Protect your bones from premature aging

Dr. Silvia Guillemi

Like most people, you probably think frail bones are the stuff of little old ladies. Think again. Bone loss and the subsequent risk of fracture is a growing concern for many people living with HIV, especially those who have other risk factors for osteoporosis or other bone disorders. As they say, an ounce of prevention is worth a pound of cure, so learn how to care for your bones before it's too late.

Gradual loss of bone strength is, to some extent, a normal part of aging. Though it affects people of all ages and both sexes, osteoporosis is two to three times more common in women than in men. Having osteoporosis means the bones are weaker and more likely to break from even the slightest trauma. Osteopenia is a lesser degree of bone loss that often precedes osteoporosis.

We all start to lose bone at age 35 at a rate of 0.5 to 1% every year, but women lose bone more rapidly after menopause. In the general population, one in four women and one in eight men over the age of 50 have osteoporosis.

Recently, doctors have begun noticing signs of accelerated bone loss in people living with HIV. Oddly enough, they're finding that men in their 40s or even younger are being affected, at a rate of up to 58% in people who have never taken antiretroviral therapy (HAART) and up to 83% in those on HAART.

Bone loss and HIV

Scientists aren't yet sure why this is happening. There are several known risk factors for osteoporosis — such as advanced age, early menopause and past fractures — in the general population, which also apply to people living with HIV. Many people have more than one risk factor that can predispose to bone loss.

HIV infection itself seems to put people at increased risk of osteoporosis. Throughout our lives, bone is continually being formed and lost at a balanced rate, and this delicate balance is somehow disrupted in people living with HIV. Some of the problems that come with chronic HIV illness like severe weight loss, hormone deficiencies and improper nutrient absorption can alter bone **metabolism** and accelerate bone loss.

Among people living with HIV, older men with lower body weight seem to be most at risk of premature bone loss. A recent study of 105 HIV-positive adults in the U.S. found 58% had osteopenia and 13% had osteoporosis. In this study, people whose CD4 cell count had ever been below 50 cells/mm³ were about twice as likely to have bone loss.

Antiretrovirals

Antiretroviral drugs (ARVs) may also contribute to premature bone loss in people living with HIV. The type of medication a person is taking, how long they're on it and the side effects associated with those particular drugs may all play a part. Lipodystrophy and **lactic acidosis**, two side effects of certain ARVs, are being investigated as potential causes.

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In the same study mentioned above, the researchers found that people treated with protease inhibitors (PIs) were two to three times more likely to have decreased bone density. In another study that included 40 HIV-positive women aged 35-55 years, osteopenia was seen in 60% of women who received a PI, compared to only 13% of those who received a regimen without a PI.

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On the other hand, some recent studies have found just the opposite. One group of researchers found no evidence of accelerated bone loss in people who were taking a PI as part of their drug regimen. The authors concluded that different protease inhibitors may have different effects on bone formation.

Other types of ARVs have also been linked to bone loss. The nucleotide reverse transcriptase inhibitor tenofovir (Viread®), for example, was shown to cause more bone loss in some areas of the body than stavudine (Zerit®) over three years of use.

Still other studies have found that ARV therapy doesn't reduce bone density at all, and may even improve it. This makes sense if HIV itself is affecting the bones. By controlling the virus and increasing CD4 cell counts, ARV therapy may actually be beneficial in increasing or maintaining adequate bone density.

All things considered, it appears that taking HAART is probably better for your bones than not taking it. We don't yet know enough about each drug's effects on bone to recommend specific ARVs or a change in your regimen based on concerns about osteoporosis.

Other medications

Other medications, some of which are commonly used in people living with HIV, can also have an effect on bone. Corticosteroids, pentamidine (a drug used to prevent or treat *Pneumocystis pneumonia*) and the antifungal ketoconazole (Nizoral®) have all been associated with bone loss.

Measuring bone loss

Osteopenia and osteoporosis are diagnosed by assessing your **bone mineral density (BMD)**,





a measurement of the strength of your bones. There are a few different ways to do this. A type of X-ray called a DEXA scan (for dual-energy X-ray absorptiometry) is the most widely used method because it's the best at predicting the risk of fracture associated with bone loss. DEXA scans usually look at the spine or hip and the result is called a t-score. Osteopenia (t-score between -1 and -2.5) means your risk of fracture is double that of a person who has a score in the normal range. Osteoporosis (t-score less than -2.5) carries a four to five times greater fracture risk.

Although it's less commonly used, a heel ultrasound is another good way to predict fracture risk. Much like the ultrasounds done on pregnant women, a heel ultrasound relies on high frequency sound waves to assess bone mineral density as well as bone structure. Finally, certain blood tests can help determine if the rate of bone loss is higher than normal.

If you have any of the following, ask your doctor to check your bone density:

- Sex hormone deficiencies (hypogonadism)
- Poor calcium intake or illness that alters its absorption
- Early menopause
- Long-term oral glucocorticoid therapy
- Primary hyperparathyroidism (an enlargement of the parathyroid gland, which causes abnormally high levels of blood calcium)
- A strong family history of osteoporosis

Not everyone living with HIV needs to be tested for osteoporosis. However, you may want to consider having your BMD measured if you have other known risk factors for osteoporosis (see sidebar).

For strong bones

The first step in preventing or treating osteoporosis is taking calcium and vitamin D supplements. In men, testosterone therapy may also improve BMD.

A group of drugs known as bisphosphonates may be useful for rebuilding bone strength. In combination with vitamin D and calcium, weekly doses of a bisphosphonate called alendronate (Fosamax®) have been shown to improve BMD in people living with HIV more than vitamin D and calcium alone, but larger and longer studies are still needed. Other bisphosphonates are available but haven't been specifically tested in people living with HIV.

For now, optimizing your calcium and vitamin D intake is the best way to prevent or deal with bone loss.

Of course, it's always better to try and avoid the problem in the first place. There are lots of ways to keep your bones healthy and strong:

- Get plenty of calcium and vitamin D — drink milk, eat dairy products, and take supplements if advised by your doctor or nutritionist
- Maintain a normal body weight
- Don't smoke
- Avoid excessive alcohol
- Exercise! Weight-bearing exercise (any activity that works your bones and muscles against gravity) like walking, running or lifting weights helps build and maintain strong bones. **R**