Boning Up on Bone Health

Growing evidence suggests that people with HIV may be at risk of bone-related problems. Derek Thaczuk and Debbie Koenig report on what you need to know.

THE RESULTS of David Vereschagin’s first-ever bone scan, performed in 2009, threw him for a loop. At age 52, he was told that he had the spine of a 70-year-old. He was cautioned against activities that might strain the bones of his spine because they could fracture.

This unsettling news was all the more surprising because Vereschagin had experienced very few health problems since testing HIV positive in 1995. In fact, for 10 years after his diagnosis he remained healthy without anti-HIV medications, beginning treatment only in 2005, when his CD4 count fell below 300 — had he waited until his count fell below 200, he would have been at risk of life-threatening complications. Since starting treatment, his CD4 count had risen and until that bone scan his only other setback had been a bout of kidney stones, a problem that was mostly under control.

Unfortunately, the caution against “spine-straining” activities included the gym workouts he had come to love. The warning “really put a fear of weight training into me,” Vereschagin recalls, “like one day I was going to lift too much and suddenly hear my spine snap.” His workouts were a significant part of his healthy living routine and Vereschagin couldn’t give them up: “I just did it with a lot more anxiety.”

In the meantime, his HIV specialist muddied the waters with a surprising opinion: She “wouldn’t have bothered” with the scan, because “nobody knows what to do” with the information scans provide. Vereschagin recalls feeling caught in the middle of these conflicting points of view and “hopelessly muddled” by this extra twist.

What exactly is going on with people with HIV/AIDS (PHAs) and their bones? Is it possible to find some answers without anxiety and confusion? Let’s give it a shot.

Hold on to your bones

Bones are strong, but they aren’t solid — their texture is dense in some spots but spongy in others. Bone mineral density (BMD) is the measurement that doctors use to evaluate the density, and by extension the sturdiness, of a bone. Bone density can vary between bones (for example, Vereschagin was told he had low spine BMD but that his hips were fine) and it changes over time. That’s because bones are living parts of your body, constantly being worn away and rebuilt. From our mid- to late-20s (when bones are at their strongest) into old age, bones erode slightly faster than they are replaced, gradually weakening the skeletal structure.

In other words, losing bone density is a normal part of aging and is not a problem when the degree of loss is small. Healthy bones are so sturdy that we can afford to lose quite a bit of bone density without any serious risk of breaking them. Loss of a moderate amount of BMD is called osteopenia. If the loss continues, bones become porous, fragile and prone to breaking — a more serious condition known as osteoporosis. Neither condition typically causes any noticeable symptoms, so they can easily go undetected until a bone breaks.

Dr. Jason Szabo, assistant professor of family medicine at McGill University, suggests that the best way to think of bone density is “as a bank account. You build it up when you’re young, with good nutrition and exercise. Then
Traditionally, in people without HIV, bone problems are most common in postmenopausal women because hormonal changes lead to a significant decline in BMD. But men with HIV are developing bone problems at an unusually early age, and postmenopausal women with HIV are more likely to develop osteoporosis and osteopenia than their HIV-negative counterparts. Figures vary, but studies suggest that osteoporosis may affect about one in 10 PHAs. And many studies have found that osteopenia (less severe bone loss) affects 30 percent or more of PHAs.

A bone of contention

The next question is: Does osteoporosis translate into an increased risk of breaking bones for PHAs? That’s certainly the case in postmenopausal women with osteoporosis, with or without HIV, so it might seem a foregone conclusion for PHAs as well. But some experts (like Vereschagin’s specialist) argue that the studies we have so far are not conclusive and that we need to do more research before we can say for sure.

Dr. Szabo is less optimistic. “We know, because of several large observational studies, that HIV greatly increases the risk of osteoporosis. Prospective studies — the kind that tell us about the outcomes [of a disease or treatment] — are much more limited. But some data do suggest that osteoporosis in people with HIV is a risk factor for fractures. I suspect that as years go on, we’ll see greater numbers of osteoporotic fractures in our HIV-positive patients.”

One study found that HIV, independent of other risk factors, increased the risk of broken bones in men by about 40 percent. While this does not appear to be the case in younger HIV-positive women, more research on older women with HIV is needed to say whether they are at higher risk of breaking a bone due to their HIV status.

What’s behind the bone loss?

What causes one person to develop bone disease and another to maintain strong healthy bones into old age?

Traditional risk factors for osteoporosis include:

- a family history of the disease
- being 65 or older
- low body mass (i.e. having a very small or thin frame)
- smoking
- heavy alcohol consumption
- long-term use of certain medications, such as glucocorticoids (for example, prednisone) for more than three months
- conditions that inhibit the body’s absorption of nutrients, such as Crohn’s and celiac disease
- a sedentary lifestyle
- hyperthyroidism
- low calcium intake
- early menopause in women (before age 45)
- low testosterone in men

People with HIV have additional risk factors for osteoporosis, including HIV infection itself: the degree of BMD loss has been shown to increase with the duration of infection. But evidence also suggests that some anti-HIV drugs, such as protease inhibitors, may be a risk factor for osteoporosis. Some studies have also suggested that the anti-HIV drug tenofovir (Viread, also in Truvada and Atripla) might have an impact on bone density, but this is not so simple. Studies found that in the year after starting the nuke, people showed rapid loss of bone density, but after this initial decline, the rate of bone loss stabilized. The take-home message: If you are taking protease inhibitors or tenofovir, you probably shouldn’t switch away from them purely because of concerns about bone loss. If you are on tenofovir and see a significant loss of BMD, you should talk to your doctor about getting tested for phosphate wasting, as tenofovir use can lead to low levels of phosphate, a mineral needed to keep your bones healthy.

Getting scanned

Knowing the risk factors for osteoporosis can help you avoid some of them and may flag a potential problem before
it occurs. However, it’s entirely possible to have several risk factors and never develop osteoporosis. Many experts believe that the best way to know for sure if there is bone loss is to get a bone scan. A bone scan is a painless, non-invasive procedure that can identify whether you have experienced significant bone loss, whether there is early loss (that may or may not worsen), or whether there is nothing to worry about. A bone scan also provides a baseline against which to compare future results.

Current guidelines recommend measuring BMD in all women and men age 65 and older; in adults 50 and over who have certain risk factors for fracture (such as long-term use of certain medications, smoking and high alcohol intake, or a fragility fracture); and in men and women under the age of 50 if they have a disease or condition associated with bone loss (such as a chronic inflammatory condition or uncontrolled hyperthyroidism). There are currently no guidelines for the use of bone scans in PHAs, but many experts believe that HIV should be added as a risk factor for osteoporosis and that PHAs 50 and over should go for bone scans every few years.

Keep in mind that the BMD results of a scan are only one of several risk factors for fracture and that many people diagnosed with osteoporosis never break a bone. Although not all experts agree on what should be done with the results from a bone scan, there are some things you can do to live well with osteoporosis.

**Treatment options**

Prevention is the best medicine when it comes to your bone health. And many of the things you can do to prevent osteoporosis also prevent bone loss in people who already have osteopenia or osteoporosis. Basically, you’re never too young or too old to start strengthening your bones.

Vitamin D₃ and calcium are essential for healthy bones. Almost every part of your body needs calcium to function properly. When you don’t get enough, the body takes it from your bones. So, if you aren’t getting enough calcium from your diet, you may want to consider supplements. For your body to absorb calcium and other minerals, it needs vitamin D₃. The sunshine vitamin is now widely touted due to widespread deficiency among Canadians and its many health benefits. (To find out about the daily recommended amounts, see CATIE’s [Practical Guide to Nutrition for People Living with HIV](https://www.catie.ca), available online and through the [CATIE Ordering Centre](https://www.catie.ca).)

Exercise makes bones denser and improves posture and balance, especially weight-bearing exercises (such as walking and Tai chi) and those that enhance core stability and strengthen muscles — all good for preventing falls and fractures. People with severe bone loss should be careful not to overstrain their bones and should check in with a doctor or sports therapist to determine the “right amount” of strain for them.

Do your bones a big favour: Avoid smoking and limit caffeine and alcohol intake.

Take precautions to prevent falls. For example, use salt or sand when the ground is icy, clear stairs, avoid walking on smooth surfaces with stockinged feet, secure loose rugs and cables.

Get checked for secondary causes. Dr. Szabo recommends getting a thorough evaluation for “secondary causes” — treatable conditions besides HIV that may contribute to the decline in BMD. For example, an overactive parathyroid gland (hyperparathyroidism) or low levels of sex hormones (hypogonadism) can contribute to bone loss. If your testosterone is low, as it is in many HIV-positive men, or if you are a woman with low estrogen due to early menopause or an eating disorder, replacement hormone therapy is available.

Finally, medication may be an option. A class of drugs called bisphosphonates can inhibit the breakdown of bone and, in some cases, increase bone mass. To date, few studies have looked specifically at the effectiveness of these drug treatments in PHAs.

**A balancing act**

Shortly after David Vereschagin’s diagnosis of osteoporosis two years ago, his family doctor recommended that he take a combination of calcium, vitamin D₃ and the bisphosphonate risedronate (Actonel). Vereschagin found that within two months of starting this regimen, his urine became very cloudy. Wondering if this could be the calcium passing through him, he brought it up with his kidney specialist, who ordered more blood and urine tests and an ultrasound that revealed possible kidney toxicity. So he stopped taking the calcium supplements. A bout of kidney stones while still taking calcium supplements and again shortly after stopping suggested that the supplements may
indeed have caused problems for his kidneys.

For Vereschagin, this episode served as a reminder of how interconnected health issues can often be. “Most of us with HIV don’t have just one health problem,” he says. Dealing with his HIV diagnosis was one hurdle, but “it’s an ongoing process. I’ve had to continually educate myself about HIV, about kidneys, about osteoporosis… everything is interconnected. You have to find what’s right for you.”

For most people, there is no reason to avoid calcium supplements or vitamin D\textsubscript{3}, but if you have a history of kidney stones or other kidney problems, it’s worth talking to your doctor to evaluate your situation thoroughly.

It seems that Vereschagin has found what’s right for him and his bones. Results of his kidney function tests are stable and his most recent bone scan suggests that his practice of weight training, yoga, avoiding calcium supplements and taking risedronate is working: It showed a five to six percent increase in spinal bone density. Also, he has had no further problems from kidney stones since that last episode. So he’s set aside his anxiety and continues to exercise, with a renewed confidence that he’s got the backbone to get him through his workouts. Score one for empowered, holistic living.

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