



Living a Normal Life with HIV

Understanding Osteoporosis

Osteoporosis is a medical condition that describes weak bones. The bones in your body are made up of living tissue that is constantly being removed and replaced. For bones to remain healthy and strong you need normal hormone levels, calcium, Vitamin D, proteins and weight bearing/strengthening exercise to keep them healthy.

Often osteoporosis arises because people lose more bone than normal and this causes bone to become fragile and to fracture more easily. The most common bones to fracture in people with osteoporosis are the hip, spine and wrist, but any bone can be affected.

Bone mineral density (BMD)

Low bone mineral density (BMD) means that the bone tissue in the skeleton is less dense and therefore potentially weaker. BMD is one of the measures used to determine if you have osteoporosis. Testing for low BMD can be done by having a simple and painless DXA scan of certain bones in your body, normally the spine and hips. The result of this test – your ‘T-score’ can help your doctor decide whether or not you have osteoporosis and also estimate your risk of having a fracture. These estimates enable the doctor to best determine what treatment plan is right for you.

Who is at risk of fracture?

There are many factors in addition to low BMD that contribute to an increased risk for fracture. Chronic illness, as well as long-term treatments can lead to reduced bone health, your general health state and how frail you are can also increase your risks of falls and fractures. However there are other factors, such as smoking, diet and exercise, which are things that we can manage as individuals.

Factors that contribute to an increased risk of fracture:

- Older age
- Family history of falls/hip fractures
- Low body weight
- Gastrointestinal disorders (such as Crohn’s, Coeliac or Ulcerative Colitis)
- Some forms of chronic arthritis, such as rheumatoid arthritis
- Some hormone disorders such as thyroid problems and diabetes
- Medications, such as high doses of steroids and some chemotherapies
- Smoking or excess alcohol intake
- A diet that is low in Calcium and Vitamin D
- Lack of regular, weight-bearing exercise





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How is BMD affected by HIV?

Low bone mineral density is common in patients with HIV. While many risk factors such as smoking, weight loss and poor nutrition, can lead to low BMD, HIV infection itself is thought to contribute to low bone density in people with HIV, through a number of factors, including chronic inflammation.

Some treatments may also contribute to loss of bone density, especially in the early period after treatment is initiated. Right now, we do not fully understand whether these reductions are due to improvements in the immune system affecting bone, a direct effect of antiretroviral medications on bone or both.

As more people with HIV live longer with effective therapy, it is important to understand why people with HIV have lower BMD so that we can prevent the unwanted side effect of low BMD such as fractures. This is an important research focus of the HMRG.

The HMRG coordinates the 'UPBEAT' study which examines the pathogenesis of osteoporosis and low bone mineral density in people with HIV. UPBEAT, one of the largest studies of its kind internationally, has followed a cohort of people both with and without HIV for the past five years and has come up with several important findings.

Since 2011, the HIV UPBEAT study has enrolled over 500 individuals, approximately half of whom are living with HIV, over a period of 5 years to compare their BMD and other tests related to bone health. Once a year, participants complete a questionnaire about their health, they receive a DXA scan and laboratory testing.

By comparing the results we have so far, we found that people with HIV have lower bone mineral density and higher bone turnover, a test that shows how much the tissue in bone leaves the skeleton. However, a more recent analysis has shown that bone density in those with HIV changes at the same rate as those without HIV, which is reassuring that once people with HIV are on stable antiretroviral treatment that they do not seem to lose bone at any faster rate than those without HIV.

As we continue this important study, we hope to learn more about the connection between HIV and bone health. This information will help healthcare providers better understand how to prevent, test and treat low BMD in people living with HIV so that we can maintain health over the long term.

The HMRG is also investigating novel treatments to prevent bone loss in people with HIV. The APART Study is an international, multisite study funded by the Health Research Board that aims to explore whether a commonly used cheap treatment to prevent bone loss can stop bone loss with initiation of antiretroviral therapy in people with HIV. This study hopes to report findings in 2018.





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How to lower risk of osteoporosis

Healthy Eating: A well-balanced diet and adequate daily fluids (2 litres) each day – preferably water!

Exercise: Weight bearing exercise helps keep bones healthy. Walking is a good start – but it should vary in intensity and not be the same every day.

Check your surroundings:

If you are at increased risk of osteoporosis you want to avoid falling. Make sure you check your home/workplace to move items that could contribute to falls, such as throw rugs and electrical cords.

Maintain calcium and vitamin D intake:

You should get enough calcium and vitamin D intake through a healthy diet. If you have low bone density, your doctor may recommend additional supplements to maintain adequate calcium and vitamin D levels.

For more information, please see Irish Osteoporosis society www.irishosteoporosis.ie

HIV Molecular Research Group

Established by Dr Paddy Mallon in 2008, the HMRG, is internationally recognized for its collaborative, translational research aimed at maintaining long term health in people living with HIV receiving antiretroviral therapy. Based at the Mater Misericordiae University Hospital campus, the group comprises researchers with laboratory, statistical and clinical research expertise.

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HMRG Publications in HIV and Bone Disease:

Cotter AG, Sabin CA, Simelane S, et al. Relative contribution of HIV infection, demographics and body mass index to bone mineral density. AIDS 2014; 28(14): 2051-60.

Tinago W, Cotter AG, Sabin C, et al. Predictors of longitudinal change in bone mineral density in a cohort of HIV-positive and negative subjects. AIDS 2017.

Alvarez E, Belloso WH, Boyd MA, et al. Which HIV patients should be screened for osteoporosis: an international perspective. Current opinion in HIV and AIDS 2016; 11(3): 268-76.

McGinty T, Mirmonsef P, Mallon PW, Landay AL. Does systemic inflammation and immune activation contribute to fracture risk in HIV? Current opinion in HIV and AIDS 2016; 11(3): 253-60.

