

## Bone Health

As we get older our bones become thinner and weaker. Thinning of the bones can occur at an earlier age for people with CF.

### What Causes Low Bone Mineral Density in CF?

It is thought this may be due to:

- Severe lung disease and recurrent lung infections.
- Malabsorption and poor nutrition: low body weight, low levels of minerals (calcium) and vitamins (vitamin D and K).
- Certain medications e.g. steroids.
- Delayed puberty.
- CF related diabetes.
- Inactivity and reduced weight-bearing exercise.
- Caffeine, alcohol and tobacco use.

There may be a direct link between low bone mineral density (BMD) and the abnormal protein produced by the CF gene.

### What is Bone Mineral Density?

BMD is a measure of the level of minerals the bones contain. BMD is usually measured by a Dual Energy X-ray Absorptiometry (DEXA) scan.

The measurements are an indicator of the bone mass and therefore how strong the bones are.

The scan is taken at the following sites on the body for approximately two or three minutes:



- Lumbar spine (below the chest and above the pelvis)
- One or both hips
- Forearm

It is important to note that the BMD score may not accurately predict the fracture risk in people with CF. BMD results can be reported as T-scores (comparing your bone density to that of an average, healthy 30 year old) or a Z-score (comparing your bone density to an average bone density of someone of your own age and gender). Z scores are usually the most appropriate method in people with CF.

A DEXA scan should be performed from approximately ten years of age and repeated every one to three years. Check with your doctors when the next one is due.

## How Can Low BMD Be Prevented and Treated?

- Regular DEXA scans to screen for low BMD.
- Optimise lung function and prevent lung infections.
- Optimise nutrition through high energy diet, oral supplements and nasogastric or gastrostomy tube feeds.
- Vitamin D levels should be screened annually through a blood test, and supplements used if recommended
- Calcium levels should be checked yearly, and low levels corrected with extra dietary supplements.
- Frequent contact with a specialist CF dietitian to gain advice on how best to boost nutrition for bone health.
- There is not yet sufficient evidence to recommend universal vitamin K supplementation for bone health in CF. However, supplementation should be considered in certain clinical situations. Always check with your doctor.
- Weight bearing physical activity is encouraged. A specialist CF physiotherapist can develop an exercise program where appropriate. This will depend on an individual's abilities and needs.
- Minimise steroid treatment as advised by your doctors.
- Avoid smoking and alcohol which can have damaging effects on bone health.

## Are There any Medications Available?

Drugs known as Bisphosphonates may be prescribed with caution in selected people with CF.

[CFTR Modulator Therapies](#) may have a positive impact on bone health in people with CF by targetting the CFTR dysfunction in bone cells.

For more information, contact your CF Centre or dietitian.

## Useful Resources

- [Bone Health and Cystic Fibrosis \(Nutrition Education Materials Online\)](#)
- [What are the Causes of Bone Disease in CF? \(CF Foundation\)](#)
- [CFWA Factsheets](#)