

## Bone Disease and Nutrition

Bone mineral density (BMD) is a measure of minerals the bones contain, indicating how strong the bones are. People with CF often have a very low BMD, which may result in conditions known as osteoporosis and osteopaenia. This means that the bones are much more fragile and likely to result in broken bones, bone pain and changes in the way bones are shaped.

In CF, malabsorption of vitamin D and K, low mineral levels (e.g. calcium), and poor nutrition, can impair bone formation. Inactivity, low body weight, delayed puberty and chronic lung disease can all lead to weak bones. Diabetes, alcohol and smoking may result in a more rapid development of osteoporosis.

The use of steroid medication pre and post lung transplant, in addition to immunosuppressive medications, can also increase bone loss.

### To reduce your risk of CF related bone disease:

- Eat a healthy, varied diet and maintain a healthy weight.
- Engage in regular weight bearing exercise to strengthen bones, as advised by specialist CF physiotherapist.
- Get at least one hour of sunlight daily to help your body make vitamin D.
- Have your vitamin D and calcium levels checked yearly, taking supplementation as required.
- Ensure you are taking the correct amount of pancreatic enzymes consistently.
- Have regular DEXA scans to screen for low BMD.



- Reduce intake of alcohol and avoid smoking.

### Vitamin D

Vitamin D helps our bodies absorb calcium, therefore it is another important factor in bone development.

The main source of vitamin D for most Australians is skin exposure to ultraviolet B radiation from the sun, although it is also present in small amounts in some foods.

Foods which contain small amounts of vitamin D include; fatty fish (mackerel, herring, sardines, tuna and salmon), liver, eggs, fortified margarine and milk products.

Vitamin D is included in CF-specific fat soluble multivitamin VitABDECK, although you may also need additional vitamin D supplementation (cholecalciferol tablets) if your levels are low.

## Vitamin K

Vitamin K also has an important role in bone density. Vitamin K can be found naturally in some foods such as leafy greens and in VitABDECK.

## Calcium

Calcium has an important role in the development of our bones, and keeping them strong. The best way to get calcium is from food. It is recommended that individuals with CF meet the Recommended Daily Intake (RDI) of calcium as per the general Australian population.

**Recommended Daily Intake for Calcium**

	Males (mg/d)	Females (mg/d)
<b>Children &amp; Adolescents</b>		
9-11 years	1,000	1,000
12-13 years	1,300	1,300
14-18 years	1,300	1,300
<b>Adults</b>		
19-30 years	1,000	1,000
31-50 years	1,000	1,000
51-70 years	1,000	1,300
>70 years	1,300	1,300
<b>Pregnant or breastfeeding women (19-50 years)</b>		1,000

*Information from Nutrition Guidelines for Cystic Fibrosis in Australia and New Zealand (2017)*

### **Dairy foods are rich dietary sources of calcium (at least 300mg/serve) such as:**

- 250mL (1x cup) calcium fortified milk (~400mg/serve)
- 250ml (1x cup) full cream/HiLo/Skim milk
- 250ml (1x cup) calcium fortified soy milk
- 200g tub natural yoghurt
- 100g tin salmon with bones or sardines
- 2x slices (40g) hard cheese
- 250ml (1x cup) custard

### **Calcium can also be found in non-dairy foods, such as:**

- Meat, eggs, fish and tofu
- Beans e.g. chickpeas, soy beans and baked beans
- Green leafy vegetables
- Dried figs and apricots
- Nuts and seeds e.g. brazil nuts, almonds and tahini

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