Cystic Fibrosis all about nutrition

Calcium and bone health in cystic fibrosis

The Cystic Fibrosis Trust is grateful to the dietitians from the Cystic Fibrosis Dietitian Group UK (CFDGUK) who prepared the information in this leaflet.

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Introduction

The information here is written by cystic fibrosis (CF) dietitians who work with adults. The information on bone health can be used by anyone with CF over 10 years of age. If you are looking for information about bone health for a baby or child (ie someone under the age of 16) you can also speak to your child's dietitian for personalised advice.

Cystic fibrosis and bone health

Our bones grow during childhood, and large amounts of calcium are needed - especially during the pubertal growth spurt. Around 90% of adult bone calcium is acquired by late adolescence. Peak bone mass is reached by the age of 30, after which our bones gradually become less dense as we get older. In CF, the bones sometimes do not become strong enough in the first place (or do not achieve peak bone mass) and/or the bone thinning process is accelerated by certain factors. This results in 'low bone mineral density'.

Low bone mineral density – what is it, and how is it measured?

Low bone mineral density means that the structure and mineral content of the bones is reduced (known as osteopenia). If the bones become very thin, this makes the bones more susceptible to fracture (break). This condition is called osteoporosis.

The following factors can put people with CF at an increased risk of low bone mineral density:

- Low body weight
- Poor calcium intake
- Malabsorption (not digesting and absorbing food adequately)
- Low vitamin levels (especially vitamin D)
- Low levels of physical activity
- Steroids
- Drinking alcohol and smoking

Bone mineral density is measured by a scan called a DEXA scan. From about 10 years of age, people with CF should have a DEXA scan every 1–3 years to monitor their bone health.

If you develop low bone mineral density, you will be probably be prescribed medication to reduce the thinning of your bones, and also calcium and vitamin D supplements to help strengthen your bones. More in-depth information about bone health can be found in our factsheet called 'Cystic fibrosis and bone health'. See page 7.

How to minimise the risk of developing low bone mineral density

There are a number of things you can do to minimise your risk of developing low bone mineral density.

Body weight

Try to ensure your weight is within the healthy range of the body mass index (BMI), which is 20–25kg/m^2. Children need to aim for a BMI between the 25th and 75th centile, and your child's dietitian will monitor this using your child's BMI centile chart. You/your child may need to increase calorie intake, in which case you should discuss the best way to do this with your/your child's dietitian. We have three leaflets about gaining and maintain a healthy weight. See page 7 for more information.

Calcium intake

It is recommended that people with CF have almost twice the recommended daily amount of calcium. The table below details the exact requirements for people with CF according to age range.

Age	Calcium intake per day
10–18	1300mg
19–50	1000mg
>50	1200mg

Try to have one pint of milk every day, as well as other calcium-rich foods. You will find information on calcium-containing foods within the 'Tasty tips for tip-top bones' section of this leaflet (page 6).

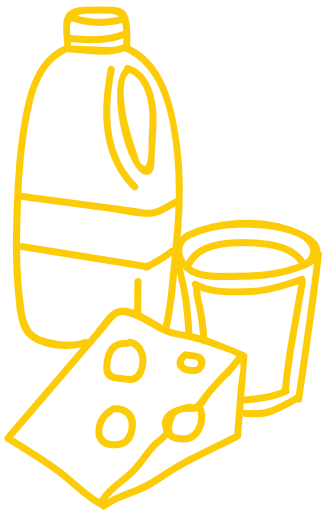
If you dislike dairy produce and are unable to get enough calcium from your diet, your/your child's dietitian or doctor may recommend a calcium supplement.

Pancreatic enzymes

Take adequate pancreatic enzymes with all your meals, snacks and milk drinks. You should discuss your enzyme dose with your dietitian if you think you are not absorbing your food properly. Signs that you may not be absorbing your diet adequately could include fatty, pale or floating stools, frequent passing of stools (eg soon after eating), abdominal pain and bloating.

Physiotherapy – manual techniques

If you have low bone mineral density and you perform percussion or manual techniques as a form of physiotherapy, you should speak to your physiotherapist about advised changes to your treatment.



Steroids

Continue to take any steroids you are prescribed, as stopping them abruptly is inadvisable. While steroids taken over a long period of time can increase the risk of osteoporosis, they are an important and useful treatment that can reduce inflammation in the lungs and aid recovery from infection. Often the benefit of taking steroids outweighs the risk of osteoporosis. If you are worried, discuss this with your CF team.

Smoking and alcohol consumption

Smoking and/or a high alcohol intake is associated with an increased risk of osteoporosis. You should avoid smoking and keep your alcohol intake to healthy limits. Men and women should not consume more than 14 units of alcohol per week.

If you need any help with trying to stop smoking or reduce your alcohol intake, please talk to a member of your CF team. Alternatively, you may be able to get help at your GP surgery.

For more information about alcohol and CF see page 7.

Vitamin levels

Most people with CF are prescribed fat-soluble vitamins (including vitamin D) to avoid them becoming deficient in essential vitamins. Vitamin D is needed to help the body absorb calcium from the diet and maintain the structure of the bones. Vitamin K is also required for healthy bones, so you may be prescribed this if you are thought to be deficient or if you have osteopenia or osteoporosis. Ensure you take your vitamin supplements regularly as prescribed, with food and enzymes.

You can also make vitamin D from the action of sunlight on your skin, so try to be outside for short periods on sunny days without sun cream to boost your vitamin D level. Most people can make enough vitamin D from being out in the sun daily for short periods with their forearms, hands or lower legs uncovered and without sunscreen from April to the end of September, especially from 11am to 3pm.

According to NHS guidance, the specific amount of time needed in the sun to make enough vitamin D is not known. There are a number of factors that can affect how much vitamin D is made, including your skin colour, how much of your skin is exposed, the time of day, the season and where you are in the world. It's important that you take care not to burn. You must cover up or apply sunscreen before your skin starts to turn red or burn.

The longer you stay in the sun without sun protection, especially for large periods of the day, the greater your risk of skin cancer. You should take extra care to protect babies and children, as their skin is much more sensitive than adult skin. Babies less than 6 months of age should not be exposed to direct sunlight.

Caution
Remember to cover up or protect your skin before the amount of time it takes you to go red or burn.

Some medications (eg Ciprofloxacin, Voricanazole) cause your skin to be extra sensitive to sunlight. If you are taking these medications, or you experience sun sensitivity, you should avoid exposure to sunlight or the use of sun beds.

Exercise

Regular weight-bearing exercise such as walking, running, aerobics, tennis, football and dancing can help to strengthen your bones. For an individual exercise programme you should speak to your physiotherapist.

Tasty tips for tip-top bones

Have breakfast every morning. eg cereal with milk, cheese on toast, milkshake and biscuits. Remember that cereal is not just for breakfast – you can use it as a snack anytime.

Have a yogurt or milk-based dessert each day after a meal or as a snack. Choose thick and creamy, Greek style or custard style yogurts, milk puddings, dairy ice-cream, milk jelly, Angel Delight or custard.

Use cheese as a topping. eg on soups, burgers, pasta dishes, jacket potatoes and in mashed potatoes.

Make your drinks out of milk. eg milky coffee, hot chocolate, Ovaltine®, Horlicks®, milkshakes.

Add milk to meals. eg creamy pasta sauces, cheese sauce, macaroni cheese, parsley sauce with fish, lasagne.

The table below provides some ideas on good dietary sources of calcium.

Food	Calcium Content Per Serving
Mug of Horlicks Original® made with milk	710mg
1 pint of whole milk	653mg
Small tin of sardines	460mg
Mug of Ovaltine® made with milk	444mg
Bowl of Ready Brek® (average serving)	400mg
Calcium-fortified bread, eg Hovis® Best of Both® (1 thick slice)	239mg
1 pot of yogurt (150g)	225mg
Cheddar cheese (30g)	216mg
Scampi in breadcrumbs (6 pieces)	190mg
Rice pudding (small pot)	186mg
Slice of pizza	180mg
Calcium-enriched soya milk (200ml)	178mg
1 cheese spread triangle	163mg
2 scoops of dairy ice cream	156mg
Custard (1 serving)	156mg
Cooked spinach (average serving)	144mg
1 original Cheesestring®	143mg
Breakfast cereal with added calcium, eg Cheerios® or Frosties® (30g; before adding milk)	136mg
Milk chocolate (standard bar)	123mg
Belvita breakfast yogurt crunch (2 biscuits)	122mg
Fortified soya yogurt/dessert/custard	120mg
Small can of baked beans	80mg
Almonds (30g)	72mg
Hummus (average serving)	62mg
Brazil nuts (30g)	51mg
Boiled broccoli (average serving)	34mg

Don't forget that supplement drinks or feeds can also contribute to your calcium intake – check the nutritional information on the packaging.

More information

‘Cystic fibrosis and bone health’. In-depth information about bone health. It describes how bone health can be affected in cystic fibrosis and the implications of this, how bone strength is measured, and options for prevention and treatment of thinning bones. cysticfibrosis.org.uk/the-work-we-do/publications/factsheets-and-information-packs

We have three leaflets which may provide you with more on being a healthy weight. **‘Achieving a healthy weight in cystic fibrosis’** is for adults who need help to gain weight. **‘Healthy eating and cystic fibrosis’** is written for adults who wish to maintain a healthy weight or may wish to lose weight. We also have **‘Eating well for children with cystic fibrosis’**. All three are available here cysticfibrosis.org.uk/nutritionleaflets

‘Drinking alcohol and cystic fibrosis’. This leaflet aims to help you drink sensibly if you choose to drink. It includes information about: the adverse effects of drinking alcohol, sensible alcohol limits, units, binge drinking, pregnancy, alcohol and liver disease, alcohol and CF-related diabetes, what to do if you think you have a drinking problem and ways to limit your alcohol intake. cysticfibrosis.org.uk/nutritionleaflets

Cystic Fibrosis Trust

The information in this leaflet is general, please discuss it with your dietitian for a more personalised look at the topic.

This leaflet is part of a broad series on nutrition. Leaflets are available as online downloads and printed copies and can be found here: cysticfibrosis.org.uk/nutritionleaflets. You can also order the leaflets and our other publications from our helpline or download them here: cysticfibrosis.org.uk/publications.

Our helpline is open Monday to Friday, 9am–5pm, and can be contacted on 0300 373 1000 or by emailing helpline@cysticfibrosis.org.uk. Trained staff can provide a listening ear, practical advice, welfare/benefits information or direct you to other sources of support.

The information in this leaflet is based on clinical best practice, a consensus of opinion by dietitians within the CFDGUK and a consensus document on nutrition management of cystic fibrosis, which you can read here: cysticfibrosis.org.uk/publications.