

What is osteoporosis?

Osteoporosis is a condition where the bones have lost calcium and other minerals, become fragile and tend to fracture more easily. In Australia, osteoporosis affects one in two females and one in three males over the age of 60.

During childhood and the teen years, particularly just before puberty, the body is very efficient at storing calcium and building strong bones. By our early twenties, peak bone mass (maximum bone density) is achieved – this is when our bones are at their strongest. Building a higher peak bone mass early in life helps prevent osteoporosis later in life. It is essential to eat enough calcium-rich foods and do regular physical activity (high impact or weight bearing) during the first twenty years of life to help achieve a healthy maximum bone density.

After peak bone mass, a woman's bones gradually lose minerals and strength. For the 5–10 years following menopause, there is a sharp decline in the amount of the hormone oestrogen in a woman's body. During this time, women may lose 2–4% of their bone per year. In men, bone loss generally occurs after the age of 50, but does not occur at the same rate as in women. By age 65, both men and women lose bone at the same rate. Eating enough calcium-rich foods is therefore essential throughout life to maintain strong bones and to help slow down the bone loss that occurs naturally with age.

Those most at risk of osteoporosis include:

- Those with a family history of osteoporosis;
- Caucasians (fair skinned) and Asians who are slim and have small bones (low peak bone mass); and
- Women who had early menopause.

A number of lifestyle factors can also increase the risk of osteoporosis:

- A low intake of calcium-rich foods, particularly a low intake of dairy foods;
- Inactivity (i.e. not undertaking regular exercise);
- Limited exposure to sunlight and therefore reduced levels of vitamin D;
- Extreme dieting, which may restrict consumption of nutritious foods and can result in low body weight;
- Smoking; and
- High alcohol intake.

Nutrition and bone health

A healthy, balanced diet will help to prevent osteoporosis. Important nutrients to consider are:

Calcium

Calcium is essential for building strong bones and preventing osteoporosis. The Dietary Guidelines for Australians specifically recommend that 'milk, yogurt, cheese and/or alternatives' be included in our daily diet for their readily-available dietary calcium and the role calcium plays in attaining peak bone mass and in preventing osteoporosis. Dairy foods such as milk, cheese and yogurt are a rich source of calcium in the Australian diet, supplying around 60% of the calcium we eat.

Foods such as canned fish eaten with their bones, green leafy vegetables, nuts such as almonds, cereals and legumes also contribute calcium to the diet, but in much smaller amounts than dairy foods. Some plant sources of calcium may contain phytates and oxalates that reduce the uptake of calcium by the body. You need to consume five cups of cooked broccoli, five cups of red beans or 165g almonds to provide your body with the same amount of calcium as it will get from one 250mL glass of milk.

Three serves of dairy foods in a balanced diet will ensure that most people will achieve their recommended dietary intake (RDI) for calcium. The higher RDI of 1300mg for

Recommended dietary intake (RDI) for calcium for various groups

	Age (years)	Calcium (mg/day)
Children	1–3	500
	4–8	700
Boys	9–11	1000
	12–13	1300
	14–18	1300
Girls	9–11	1000
	12–13	1300
	14–18	1300*
Men	19–70	1000
	Over 70	1300
Women	19–50	1000
	Over 50	1300
Pregnant women	Over 18	1000
Breastfeeding women	Over 18	1000

RDI reference: NHMRC 2005, Nutrient Reference Values for Australia and New Zealand.

* Note that there is no increase in the RDI for 14–18 year old girls who are pregnant or lactating.

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teenagers, women over 50 and men over 70, makes it even more important for those groups to have at least three serves of dairy foods a day. A serve is equal to a 250mL glass of milk, a 200g tub of yogurt, or two slices of cheese (40g). Each serve provides approximately 300mg of calcium. If you are watching your weight, or dietary fat intake, choose reduced or low fat dairy foods. Most contain a similar amount of calcium to the regular fat varieties.

Vitamin D

Vitamin D helps the body to absorb calcium. Not having enough vitamin D can increase the risk of developing osteoporosis. Our bodies produce vitamin D when the skin is exposed to sunlight. Osteoporosis Australia recommend six to eight minutes sun exposure a day (before 10am or after 2pm Standard Time in summer, for moderately fair people) about four to six times a week to get enough vitamin D. Visit the Osteoporosis Australia website www.osteoporosis.org.au for more specific advice on appropriate sun exposure where you live.

Protein

Protein is an important nutrient for bone health because it helps to build bone. Numerous studies have shown that people who consume adequate levels of protein tend to have improved bone health compared to those who consume inadequate protein levels. Dairy foods have an excellent balance of calcium and protein.

Phosphorus

Phosphorus is just as important for strong bones as calcium. Unlike calcium, which is often underconsumed, phosphorus is readily available from a lot of foods, including dairy foods, so deficiency is rare.

Sodium

When dietary calcium intake is inadequate, too much sodium in the diet can cause calcium to be lost from the body in urine. It is important to choose reduced salt foods and avoid adding salt to meals.

Tips to help prevent osteoporosis

To help prevent osteoporosis, physical activity is important, especially weight-bearing exercise and resistance (weight) training exercise. Doing 30 to 40 minutes of activity (like walking, jogging, tennis, golf, dancing and lawn bowls) four to six times a week will help build and maintain strong bones, and help you stay fit and healthy.

There are some risk factors for osteoporosis we cannot alter, such as age, gender and genetics, but some things we can do to help protect ourselves against it include:

1. Consume plenty of calcium-rich foods, such as milk, yogurt and cheese, every day, throughout life
2. Regularly participate in weight-bearing activity (e.g. brisk walking, tennis, netball or soccer) and resistance training exercise (e.g. lifting weights)
3. Regular safe sun exposure for adequate vitamin D
4. Moderate your alcohol intake
5. Moderate salt intake
6. Avoid smoking
7. If you are a woman, seek medical advice about your risk of osteoporosis and consider having your bone density measured before menopause.

The role of calcium-rich dairy foods in the prevention of osteoporosis

Dairy foods such as milk, cheese and yogurt contain at least 10 essential nutrients, including:

- Protein
- Carbohydrate
- Vitamins (A, B12 and riboflavin)
- Minerals (calcium, phosphorus, magnesium, potassium and zinc)

With their unique balance of bone building nutrients (calcium, protein and phosphorus), dairy foods have a key role to play in the prevention of osteoporosis across all ages.

Studies of children and teenagers have shown that consuming dairy products increases bone density and bone mass, which are measures of bone strength. However, children who avoid milk have been found to have lower bone mineral density and may be at greater risk of breaking a bone. In females, a lower intake of milk during childhood and adolescence has been associated with lower bone density and greater risk of fracture in adulthood.

In studies where postmenopausal women consumed extra milk or milk powder, bone loss was slowed or prevented.

People who have at least 3 serves of dairy food every day as part of a balanced diet are likely to receive the recommended dietary intake for calcium. Choose from the wide variety of regular fat, reduced fat, and low fat dairy foods to suit your diet and lifestyle.

