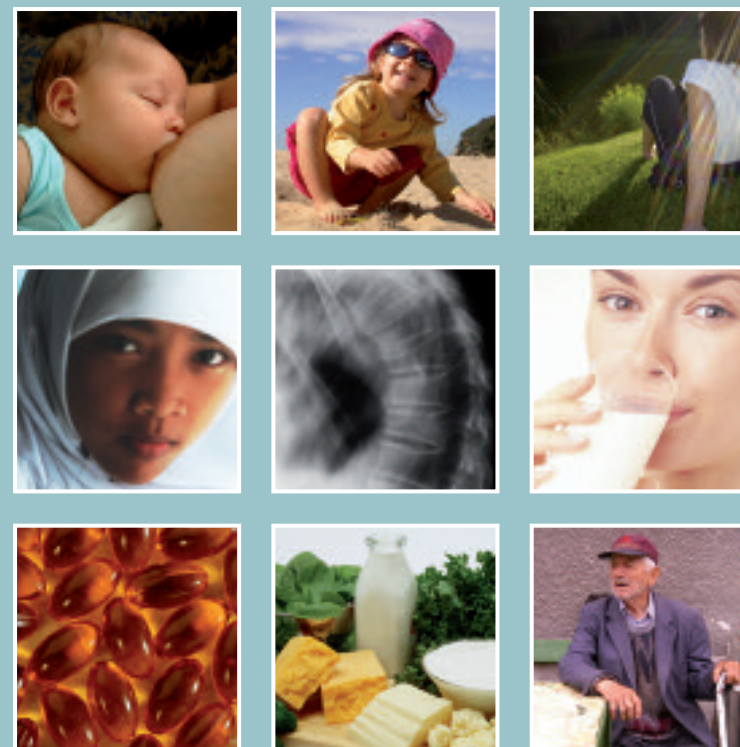




CALCIUM, VITAMIN D & OSTEOPOROSIS



www.osteoporosis.org.au

1800 242 141

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A Guide for Consumers

KEY POINTS

- 1 in 2 women and 1 in 3 men over 60 years in Australia will suffer an osteoporotic fracture.
- Calcium and vitamin D are two key ingredients for building and maintaining strong bones.
- More than half of all Australian adults do not get their recommended daily intake of calcium, even though it is easily obtained from foods.
- 1000mg of calcium a day is recommended for all adults and 1300mg a day is recommended for people over 70 years of age.
- Three serves of dairy foods a day are generally recommended for most kids and adults to help meet your daily calcium needs.
- Vitamin D deficiency can lead to bone pain, muscle weakness, increased risk of osteoporosis, falls and fractures.
- Those most at risk of vitamin D deficiency include: older people living in residential care, people with dark skin, people who cover most of their bodies and heads (veil) for cultural or religious reasons, people with chronic illnesses.
- For the general population, limited and casual exposure to sunlight can provide adequate amounts of vitamin D.
- If you are at high risk of vitamin D deficiency then speak to your doctor about supplements.
- Foods in general have very little vitamin D.

This Guide has been developed for consumers, based on the Recommendations from the Vitamin D and Calcium Forum, held in Melbourne, July 28 and 29, 2005, and on current research.

This Forum was a joint initiative of Osteoporosis Australia and The Australian and New Zealand Bone and Mineral Society (ANZBMS), supported by The Australian Government.

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1. INTRODUCTION

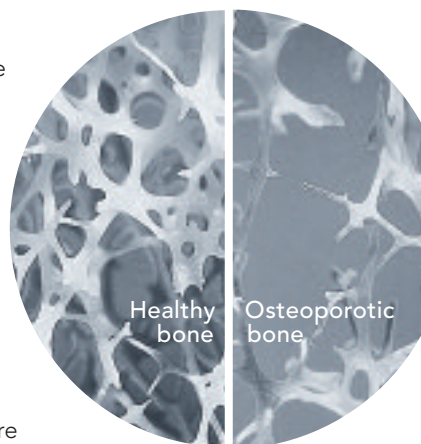
WHAT IS OSTEOPOROSIS?

Osteoporosis is a condition where your bones become fragile and brittle and fracture more easily than normal bone. Even a minor bump or fall can cause a serious fracture. In Australia, half of all women and one third of men over 60 will have a fracture due to osteoporosis.

Osteoporosis and fractures are major causes of injury, long term disability and even death in older Australians. One fifth of people who suffer a hip fracture will die within 6 months and of those who don't die, one half will not be able to walk unaided or remain in their own home.

Osteoporosis is often called a 'silent disease' because there are usually no signs or symptoms until a fracture occurs.

Any bone can fracture from osteoporosis, but the most common sites are bones in the hip, spine, wrist, ribs, pelvis and upper arm. Osteoporosis can also result in 'crush' or 'wedge' fractures in the bones of our spine (vertebrae), causing loss of height, increased curvature of the spine (Dowager's hump) and increased pain.



THE CASCADE EFFECT OF FRACTURES

Women who have suffered a vertebral fracture are 5 times more likely to suffer another fracture within 12 months. This is called 'the cascade effect' and the risk of experiencing further fractures increases greatly with each new fracture.

CALCIUM AND VITAMIN D

Good calcium nutrition and vitamin D levels are important for the health and strength of our bones, but may also have broader effects on wellbeing in general. Average dietary calcium in Australia needs to be increased, particularly in young women. Vitamin D deficiency is surprisingly common – even in a sunny country like Australia.

This booklet is designed to help you identify your needs for both calcium and vitamin D intake, be it by dietary intake or supplementation.

1 in 2 women & 1 in 3 men over 60 years will have an osteoporotic fracture in Australia.

2. CALCIUM

ABOUT CALCIUM

Calcium is a building block for our bones. It is deposited as a crystal onto our bones, giving bone its hard strength. Bone also acts as a storage bank for calcium – when your dietary intake of calcium is too low, your body will snatch calcium from your bones to use elsewhere for other important functions, involving muscles and nerves.

That is why it is so important to have a daily supply of calcium, at the recommended level for your age and stage of life.

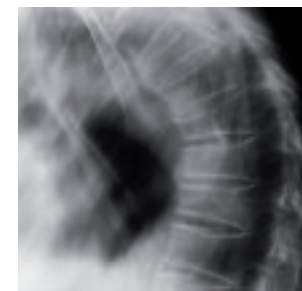
In general, we get calcium from some of the foods we eat but dairy products are the best source of calcium (see table containing calcium levels in foods).

Some people cannot tolerate dairy foods but this does not mean that they cannot get enough calcium from their diet.

There are other foods, as you will find as you read through this booklet, that you can include in your diet, which will help you to increase the amount of calcium in your diet.

The amount of calcium that is absorbed from the diet depends on many factors and includes:

- how much active vitamin D you have in your system,
- how much calcium you get from your diet on a regular basis,
- your age, and
- in females, your internal oestrogen concentration.



3. NUTRIENT REFERENCE VALUES

The nutrient reference value (NRV) refers to what was previously known as recommended daily intake (or RDI). There are some general guidelines for the NRV of both calcium and vitamin D in Australia, however these change according to many factors including age, gender, life stage, diet and for those with a specific deficiency.

Calcium

The average Australian adult is recommended to achieve an NRV of 1000mg of calcium per day. For those older than 70 years the NRV is 1300mg of calcium per day.

Vitamin D

The average Australian is recommended to achieve an NRV of 10-15µg (or 400-600IU) of vitamin D per day.

GOOD CALCIUM NUTRITION

Calcium performs various functions in the body and plays important roles in the muscular, nervous and endocrine (hormone) systems. Getting enough calcium is important to help protect us from developing osteoporosis later in life.

It is also important to maintain adequate levels of vitamin D, as it helps in the absorption of calcium. By age 30, peak bone mass (maximum bone density) is reached and most of this is achieved by puberty when there is the greatest rate of growth. Adequate calcium is especially important during childhood and adolescence, and yet this is often a time of inadequate calcium intake.

Later in life, when the body loses calcium, particularly around the time of menopause for women, there is an increased requirement for calcium. As men also lose calcium throughout the ageing process, it is also important that they consume enough calcium.

CALCIUM FROM FOOD

Most studies show that the required daily intake for postmenopausal women is between 1100 and 1300mg of calcium. Approximately 60% of our calcium intake comes from dairy products, the rest from the small amounts contained in breads, cereals, fruits and vegetables.

In general, 3 serves of dairy products per day (one serve is equal to 250ml milk, 1 tub yoghurt etc), will provide the NRV for most Australians.

Low fat dairy options are usually available and are preferable for some individuals. For those with inadequate calcium intake, it may be necessary to include calcium supplements.

If you cannot tolerate dairy products, especially if you are lactose intolerant or vegan vegetarian (vegan vegetarians do not eat any animal products whatsoever including any dairy), there are now an increasing number of calcium-enriched products, for example orange juice, cereals, soy milks and even some breads.

TABLE 1 THE CALCIUM CONTENT OF MANY COMMON FOODS

FOOD	STD SERVING SIZE	CALCIUM (MG)	KILOJOULES
Rump Steak (lean)	100g	5	883
Apples	1 medium (156g)	7	323
Lamb Chop (lean)	100g	8	1000
Bread - mixed grain	30g (slice)	15	272
Bread - wholemeal	30g (slice)	16	282
Chicken - roasted no skin	100g	16	783
Broccoli	60g	18	61
Strawberries	1 cup (145g)	19	118
Eggs - boiled	1 large (48g)	21	303
Baked Beans	100g	34	285
Oranges	1 medium (122g)	35	190
Apricots - dried	50g	35	410
Spinach	100g	50	80
Tahini	20g (1 tbsp)	65	520
Soy beans (boiled)	100g	76	540
Custard	100g	100	393
Almonds	50g	110	1235
Ice Cream	100g	133	800
Tofu (calcium set)	100g	150	479
Salmon - tinned, red	100g	220	814
Sardines - canned	100g	380	951
Cheese - mild	40g (piece)	300	676
Cheddar (reduced fat)	40g (2 slices)	323	548
Cheddar Cheese	40g (2 slices)	327	575
Yogurt - Low fat	200g (std tub)	316	738
Yogurt - Plain	200g (std tub)	390	716
Milk - Regular	250ml (std glass)	285	698
Milk - Reduced Fat (1%)	250ml (std glass)	352	525
Milk - Skim	250ml (std glass)	320	377
Milk - Calcium Fortified	250ml (std glass)	353	523

4. CALCIUM INTAKE AND RECOMMENDATIONS

WHO NEEDS TO EAT WHAT?

- Children 5 to 9 years should aim for 2 to 3 serves of calcium-rich foods each day to reach a total intake of 800 -1000 mg/day.
- Children and Adolescents aged 9 to 18 years should aim for at least 3 serves of calcium-rich foods a day to reach a total intake of 1000 -1300mg/day.
- Adults up to the age of 51 years should aim to consume at least 2 serves of calcium-rich foods a day to reach a total intake of 1000 mg/day.
- Postmenopausal women should aim for at least 3 serves of calcium-rich foods to reach a total daily intake of 1000 -1300 mg/day.
- For adults over 70 years 1300 mg of calcium a day is recommended.

The body tries to maintain a balance of calcium throughout life. To ensure adequate balance, you need to consume enough calcium in your diet and avoid excessive amounts of salt, caffeine, animal protein and alcohol. This is important throughout life and particularly during periods of maximum bone growth such as our childhood and teenage years, during pregnancy and breastfeeding. For women, it is also important to ensure adequate calcium intake around the time leading up to and after the menopause.

PRACTICAL TIPS

- 3 serves of dairy food will generally give you your recommended daily calcium intake.
- Add skim milk powder to soups, puddings, smoothies, milkshakes and sauces.
- For a healthy heart, choose low fat dairy foods (for example, low fat milks and yoghurts). They have as much calcium as regular dairy foods.
- Eat more broccoli, beans, almonds, tinned salmon and sardines in your regular diet.
- Hard cheeses (eg cheddar) have more calcium than soft cheeses (eg cottage cheese). Choose fat reduced varieties where available.
- Look for breads and juices that are calcium fortified.
- If you use soy drinks, choose the ones specifically labelled as fortified with calcium and similarly choose tofu that has high calcium content.
- Look for new products in your supermarket chilled sections, such as dairy desserts and creamed rice, to add more calcium to your diet.
- Get advice from a dietician or nutritionist if you need help with increasing the calcium in your diet or for general advice on healthy eating.

CALCIUM FROM SUPPLEMENTS

If your dietary intake of calcium is low and you are unable to increase it to the recommended levels, your doctor may suggest that you take calcium supplements. Calcium supplements are a very useful way of helping people who are unable to consume sufficient calcium from the food they eat. An extra 500 -700 mg of calcium per day is sufficient for most people to achieve their appropriate daily calcium intake.

The easiest way to do this is with a single calcium tablet containing 600mg of calcium. Many companies now provide calcium tablets which also contain vitamin D. Vitamin D aids the absorption of calcium from the intestines.

WHEN AND HOW TO TAKE THEM

- Generally, it is not important whether calcium tablets are taken with or without food. There is some evidence that taking calcium supplements in the evening may be of benefit, to prevent bone breakdown.
- Calcium carbonate requires gastric acidity for the best absorption, so it should be taken with meals. Calcium citrate is not dependant on gastric acidity so can be taken at any time.
- If you are taking an oral bisphosphonate for your osteoporosis (for example, Actonel or Fosamax), it is very important that you take the calcium supplement and your osteoporosis medication several hours apart, otherwise the absorption of one medicine interferes with the other.

FACTORS THAT CAN AFFECT THE ABSORPTION OF CALCIUM SUPPLEMENTS

Certain things can interfere with calcium being absorbed. These include:

1. **Certain foods** – Phytates (found in cereals, bran, soy beans, seeds) and oxalates (found in spinach, rhubarb, walnuts). Therefore, some vegetarian diets may decrease the amount of calcium absorbed from the diet.
2. **Inadequate vitamin D** – Less calcium is absorbed in the intestines of people with inadequate vitamin D levels. People who are at high risk of vitamin D deficiency include those who are housebound, the elderly, people in residential care and dark-skinned people (especially if veiled).
3. **Long term treatments with steroids** (eg. prednisolone & prednisone)
4. **Kidney disease**



SIDE EFFECTS OF SUPPLEMENTS

Calcium supplements are usually well tolerated. Side effects, although uncommon, can include constipation, bloating and flatulence. There is no evidence of increased kidney stones from taking calcium supplements in the recommended amounts.

Generally, calcium supplementation is recommended when there is not enough dietary intake of calcium. For most people, the added 600mg of elemental calcium is sufficient to boost your calcium intake into an adequate range.

COMMONLY ASKED QUESTIONS

1. Does calcium cause bone spurs?

There is no evidence that shows bone spurs are related to calcium supplements.

2. Does calcium cause kidney stones?

It is wise to avoid calcium intakes over 2000mg a day. An intake of between 800mg - 1500mg a day is unlikely to lead to kidney stones. If you have had kidney stones in the past, you should check with your doctor before starting a calcium supplement. Some metabolic disorders may cause kidney stones.

Always drink plenty of fluids throughout the day when you take calcium supplements.

3. Does calcium cause constipation?

Calcium supplements can cause constipation in some people, but the problem can generally be avoided by consuming enough fluids and fibre.

4. What about calcium and men?

Much less research has been carried out with calcium and osteoporosis in men. As men are now living longer, many more are at risk of developing osteoporosis (1 in 3 men over 60 years).

It is therefore important that they also follow the same recommendations as women regarding calcium intake and exercise to reduce their risk of osteoporosis.

There is no significant difference in the absorption of calcium from supplements compared with different dietary sources.

5. VITAMIN D

WHAT DOES VITAMIN D DO?

Vitamin D has several actions. It:

- helps increase the absorption of calcium and phosphorous from the small intestine
- helps regulate the amount of calcium in the blood
- helps strengthen the skeleton



ABOUT VITAMIN D

Vitamin D₃ (one of the active forms of vitamin D) is made in skin from the absorption of UV light.

To get enough sunlight to produce vitamin D, a person needs to expose their hands, face and arms (or equivalent area of skin) to sunlight for about 6-8 minutes just before 10 am or after 2 pm Standard Time in summer, for moderately fair people. This would produce around 1000 IU of vitamin D (See Table 2) – around one third of a minimal erythemal dose (MED).

Sun exposure like this on most days would be enough for most people to maintain adequate vitamin D levels.

Longer exposures would be needed in darker skinned individuals. The ability to produce vitamin D is often reduced in older people.

There is little vitamin D in most Australian diets and the vitamin D in most supplements is either D₂ (the plant form) or vitamin D₃.

VITAMIN D₂ AND D₃ EXPLAINED

There are 2 forms of vitamin D:

1. D₃ (cholecalciferol) which is formed in the skin by the action of ultraviolet (UV) light
2. D₂ (ergocalciferol) which is produced by UV light irradiating a plant compound (ergosterol)

There is some evidence that vitamin D₃/cholecalciferol may raise the levels of vitamin D in the blood more effectively but overall differences are probably not large.

6. SOURCES OF VITAMIN D

VITAMIN D DEFICIENCY

Vitamin D is an important factor for healthy bones with vitamin D deficiency in older adults leading to an increased risk of osteoporosis, falls and fractures. It is not true that all Australians receive adequate vitamin D from casual exposure to sunlight. Vitamin D is necessary for the body to absorb calcium, a building block for healthy bones, from the food we eat.

Vitamin D deficiency in children can result in rickets, which causes bone and muscle weakness and bone deformities. Low levels of vitamin D in adults may result in bone pain, muscle weakness, falls and osteoporotic fractures.

Vitamin D deficiency, especially in the elderly, increases the risk of developing major illnesses, especially osteoporosis, falls and fractures.

It is also associated with other conditions, including autoimmune diseases (rheumatoid arthritis, multiple sclerosis and type 1 diabetes), cardiovascular disease and some cancers.

Adequate vitamin D intake is especially important for pregnant women with risk factors for vitamin D deficiency because of the long term effects of fetal deficiency, and for infants of women at risk (especially if breastfed).

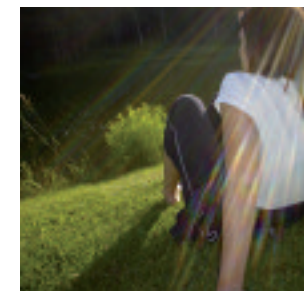
MAJOR RISK FACTORS FOR VITAMIN D DEFICIENCY ARE:

- Older people, especially those who are house-bound or cannot walk, who live in nursing homes or other institutions (i.e. having limited sunlight exposure).
- Mental impairment.
- Gastrointestinal disease, especially with malabsorption.
- Some medications (eg. antiepileptic agents).
- Limited sunlight exposure (eg. those who cover most of their bodies for cultural or religious reasons).
- Limited effect of sunlight exposure (eg. people with dark skin who have a limited effect of sunlight exposure).
- Some other chronic illnesses.

EXPOSURE TO SUNLIGHT

For Australians, the main source of vitamin D is from exposure to sunlight. Most people reach adequate vitamin D levels during typical day-to-day outdoor activities.

Exposure of the face, hands and arms or of the legs to modest amounts of sunlight to reach one-third of a minimal erythema dose (MED) most days as part of daily living is likely to achieve vitamin D sufficiency.



One MED (minimal erythema dose) is the amount of sun exposure that produces a faint redness of the skin. Exposure of around 15% of body surface (eg. hands, face and arms) to around 1/3 of a MED would produce around 1000IU (International Units) of vitamin D.

Older people need exposure to sunlight 5-6 times a week, while people with dark skin need longer exposure times of around 15 minutes.

Exposure to sunlight between 10 am and 2 pm in the summer months (11 am - 3 pm in daylight saving) is not advised or recommended, due to the cancerous effects of sunlight at that time. This outweighs any possible benefits from vitamin D production.

Levels of vitamin D in our bodies are lower in winter than in summer. In winter, it would take longer to get this dose of sunlight, depending on where you live – not much longer in Cairns, but around 5 times longer in Melbourne (see Table 2).

In most cases, any reduction in vitamin D during winter is made up in the summer when sunlight is more intense.

7. VITAMIN D INTAKE AND RECOMMENDATIONS

TABLE 2 SUN EXPOSURE TO ACHIEVE SUFFICIENT VITAMIN D FOR PEOPLE WITH MODERATELY FAIR SKIN*

Region	DECEMBER - JANUARY		JULY - AUGUST	
	At 10am or 2pm [†]	At 10am or 2pm	At 10am or 2pm	At 12 noon
NORTHERN AUSTRALIA				
Cairns	6 to 7 minutes	9 to 12 minutes	7 minutes	
Townsville	5 to 7 minutes	9 to 13 minutes	7 minutes	
CENTRAL AUSTRALIA				
Brisbane	6 to 7 minutes	15 to 19 minutes	11 minutes	
Perth	5 to 6 minutes	20 to 28 minutes	15 minutes	
SOUTHERN AUSTRALIA				
Sydney	6 to 8 minutes	26 to 28 minutes	16 minutes	
Adelaide	5 to 7 minutes	25 to 38 minutes	19 minutes	
Melbourne	6 to 8 minutes	32 to 52 minutes	25 minutes	
Hobart	7 to 9 minutes	40 to 47 minutes	29 minutes	
NEW ZEALAND				
Auckland	6 to 8 minutes	30 to 47 minutes	24 minutes	
Christchurch	6 to 9 minutes	49 to 97 minutes	40 minutes	

* Sun exposure times resulting in $\frac{1}{3}$ minimal erythemal dose. Exposure times for people with highly pigmented skin would be three to four times greater.

† 11am or 3pm daylight saving time, respectively.

Adapted from: Working Group of the Australian and New Zealand Bone and Mineral Society, Endocrine Society of Australia and Osteoporosis Australia. Vitamin D and adult bone health in Australia and New Zealand: a position statement. *Med J Aust* 2005; 182: 281-284.

DIET AND VITAMIN D

Vitamin D is found in small quantities in a few foods, such as:

- fatty fish (salmon, herring and mackerel)
- liver
- eggs
- fortified foods such as margarine and some low-fat milks, although in very small amounts.



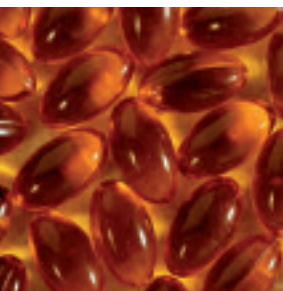
For most Australians, adequate vitamin D is unlikely to be achieved through diet alone.

GROUPS AT RISK OF VITAMIN D DEFICIENCY:

- the elderly, particularly those who are house-bound or in residential care
- people with skin conditions where avoidance of sunlight is advised
- those with dark skin
- women who wear veils and/or cover most of their body
- those with chronic illness

PRACTICAL TIPS FOR INCREASING VITAMIN D INTAKE

- Follow the advice set out in Table 2 for limited sunlight exposure.
- If you are vitamin D deficient or at high risk of being deficient, then a vitamin D supplement is recommended (speak to your doctor).
- The main food sources of vitamin D are fortified margarines, fortified milks, fatty fish and eggs. Look out for other fortified foods as they come on the market.



VITAMIN D SUPPLEMENTATION

The daily vitamin D requirement is at least 400-600 IU. If sun exposure is not possible, then a vitamin D supplement of at least 400 IU (10µg) per day is recommended. A larger dose (3000-5000 IU) per day is needed to treat people with a deficiency.

Some calcium supplements and multivitamin preparations contain vitamin D but their levels may be too low to treat vitamin D deficiency.

Cod liver oil contains a good dose of vitamin D but also contains vitamin A which in large amounts can cause toxicity and may even increase the risk of fracture.

Single pure vitamin D preparations in Australia exist.

Always discuss medications or supplements with your doctor before taking them.

TOXICITY

Vitamin D toxicity cannot be caused by prolonged sun exposure but it can happen if you have too much vitamin D by taking supplements.

The symptoms of vitamin D toxicity include loss of appetite, nausea, weakness, frequent urination, muscles aches and spasms. In severe cases, vitamin D toxicity can lead to irreversible kidney and heart failure or coma and even death. Vitamin D toxicity is, however, very rare.

WHAT IS MY LEVEL OF VITAMIN D?

The only way to check your level of vitamin D is to have your GP do a blood test.

People who feel they are at risk, or anyone who is concerned about their vitamin D level, should discuss this with their doctor.

COMMONLY ASKED QUESTIONS

1. **I have very pale skin and am worried about getting sunburnt if I go into the sun too much to try and get enough vitamin D – what do you suggest?**

Obviously protecting your skin from sunburn is extremely important and is the reason why we would never suggest you go out into the sunshine in the middle of the day in summer months to absorb vitamin D.

You can easily get enough vitamin D from the sun, before 10am and after 2pm in summer.

See the table on page 14 about recommended sun exposure times for different times of the year.

2. **Can you get enough vitamin D from foods?**

No. Vitamin D is only found in small quantities in a few foods in the Australian diet, making it extremely difficult to get your recommended daily intake of vitamin D from food alone.

That is why limited sun exposure is recommended for the general population and vitamin D supplementation is recommended for people who are at risk of vitamin D deficiency (older people who live in residential care, people with dark skin and women who wear veils and coverings).

3. **Can you absorb vitamin D if you are wearing sunscreen?**

No. You should not wear any sun screen if you want to absorb the vitamin D from the UV rays.

That's why it is **not** recommended that you go in the sun, for your vitamin D, between 10am and 2pm in summer months.

Protecting your skin from sunburn and skin cancer is of vital importance – remember to keep up the 'slip, slop, slap'.



8. WHAT DO THESE WORDS MEAN?



Bone Spur

An extra bit of bone that grows out of existing bone.

Deficiency

A lack of a normal level. For example, Vitamin D deficiency leading to health problems.

Dowager's Hump

The hump that develops in the middle part of your spine after several spinal osteoporotic fractures have occurred. This bone deformity is more common in women than men.

Fracture

A break in your bone (*an osteoporotic fracture is a fracture caused by osteoporosis*).

Fracture Cascade

Also called the 'domino effect'. In osteoporosis, once one fracture has occurred, another is more likely to occur if nothing is done.

Malabsorption

Not being able to absorb nutrients properly in the intestine.

Minimal Erythema Dose (MED)

This is the amount of sun exposure that produces a faint redness (erythema) on your skin. Sun exposure that gives you $\frac{1}{3}$ of a MED, on most days is likely to give you enough vitamin D.

Nutrient Reference Value (NRV)

Refers to what was previously known as the Recommended Daily Intake.

Osteoporosis

Osteoporosis is a condition in which the bones become fragile and brittle, leading to a greater risk of fractures (breaks or cracks) than normal bones.

Post-Menopausal

This is the time period that starts immediately after menopause in women.

Toxicity

Means poison. If a substance is toxic, it means it is poisonous.

Vegan

Refers to a person who is a vegetarian who doesn't eat any animal products whatsoever, as in dairy products, eggs and so on.

Vertebrae

The bones that make up the spine.

9. USEFUL WEBSITES

Osteoporosis Australia

www.osteoporosis.org.au

International Osteoporosis Foundation

www.osteofound.org

Dieticians Association of Australia

www.daa.asn.au

The Cancer Council Australia

www.cancer.org.au

10. STATE OFFICES

Osteoporosis New South Wales

13 Harold Street

North Parramatta NSW 2151

Locked Bag 16, North Parramatta NSW 2151

Tel: 02 9683 1622

Fax: 02 9683 1633

Osteoporosis Victoria

263-265 Kooyong Road

Elsternwick VIC 3185

PO Box 130, Caulfield South VIC 3185

Tel: 03 8531 8000

Fax: 03 9530 0228

Osteoporosis Queensland

Cnr Cartwright Street & Lutwyche Road

Windsor QLD 4030

PO Box 2121, Windsor QLD 4030

Tel: 07 3857 4200

Fax: 07 3857 4099

Osteoporosis South Australia

Unit 1/202-208 Glen Osmond Road

Fullarton SA 5063

Tel: 08 8379 5711

Fax: 08 8379 5707

Osteoporosis Western Australia

17 Lemnos Street

Shenton Park WA 6008

PO Box 34, Wembley WA 6913

Tel: 08 9388 2199

Fax: 08 9388 4488

Osteoporosis Tasmania

127 Argyle Street

Hobart TAS 7000

Tel: 03 6231 2988

Fax: 03 6234 4899

Osteoporosis Australian Capital Territory

2B Grant Cameron Community Centre

27 Mulley Street, Holder ACT 2611

GPO Box 4017, Weston ACT 2611

Tel: 02 6288 4244

Fax: 02 6288 4277

Osteoporosis Northern Territory

4/6 Caryota Court

Coconut Grove NT 0810

PO Box 452, Nightcliff NT 0814

Tel: 08 8948 5232

Fax: 08 8948 5234