



PATIENT GUIDE TO CALCIUM & VITAMIN D3

**Osteoporosis affects 1 in 5 men,
1 in 2 women over 50
and children can also be affected**

Irish
Osteoporosis
Society



What is Osteoporosis?

Osteoporosis basically means porous bones. It is a silent disease that is usually not diagnosed until a fracture/s (broken bone/s) occurs.

Bone is a living tissue that is constantly being removed and replaced. As we get older, more bone is naturally lost than is replaced, but people with osteoporosis lose more bone than people who do not have the disease. Osteoporosis causes bones to become fragile and therefore they break easily e.g. through a minor bump or fall from a standing position or less. A broken bone as a result of a trip or fall is not considered normal as an adult, even if the fall was on cement or ice.

Osteoporosis can affect the whole skeleton, but the most common bones to break are the wrist, spine and hip. One in five men and one in two women over 50 will fracture a bone as a result of osteoporosis and children can also be affected. 90% of hip fractures are due to osteoporosis, yet only approximately 15% of people with osteoporosis are diagnosed.

It is a preventable and treatable disease in the majority of cases, but early diagnosis is essential for the best prognosis. A DXA scan of your spine and hips is the gold standard for diagnosing osteoporosis and is highly recommended if you are at risk.

The IOS does **not** recommend any type of heel scan for the diagnosis of osteoporosis.

If you have osteopenia (the early stages of osteoporosis), the IOS recommends that you find out if it is mild, moderate or marked osteopenia. Research shows that the majority of fractures happen in the moderate to marked osteopenia range, which is a T score of -1.5 to -2.5. Depending on the cause(s), people who have moderate or marked osteopenia may need to be placed on an osteoporosis medication as well as calcium, Vitamin D3 and daily weight-bearing/strengthening exercise, to prevent further bone loss and reduce their risk of fracture or re-fracture. It is essential that all cause/s are found and addressed as well as the osteopenia and/or osteoporosis.

If you have osteoporosis, Calcium, Vitamin D3, daily weight-bearing/strengthening exercise, combined with an osteoporosis medication is usually the recommended treatment to prevent further bone loss and reduce the risk of a fracture or further fractures.

What is Osteopenia?

Osteopenia is the early stages of osteoporosis and unless preventative measures are put in place, it can develop into Osteoporosis. Research shows that majority of fractures happen in the moderate to marked osteopenia range.

Why is it so important to prevent and treat Osteoporosis?

- 20% of people aged sixty+ who fracture a hip, pass away because of complications within six months to a year.
- 50% of people aged sixty+ who fracture a hip, are unable to wash, dress or walk across a room unaided.
- Only 30% of people aged sixty+ who fracture a hip regain their independence.
- 90% of hip fractures are due to osteoporosis.
- Secondary complications of a hip fracture are: blood clot, pneumonia or infection.
- Low calcium and vitamin D intake is linked to an increased risk of hip fractures in the elderly.
- From age 75+ a person is 25 times more at risk of fracturing a hip.
- One fractured hip in total costs approximately €31,000, a DXA scan costs €100



The only signs and symptoms that may suggest that a person may already have developed Osteoporosis are:

- Loss of height (more than 2cm), which can be due to the vertebrae (bones in spine) collapsing.
- A broken bone from a trip or fall from a standing position or less.
- If a hump develops on the upper back and / or the persons head

begins to protrude forward from their body.

- A change in body shape and size occurs. Example: Pot belly developing and/or rib pain
- Undiagnosed sudden, severe episodes of upper, middle or low back pain.

Note: most people experience no pain until they have a fracture.



EFFECTS OF UNDIAGNOSED OSTEOPOROSIS

- As the vertebrae collapse, loss of height usually occurs. Once a vertebral fracture has occurred, unless preventative measures are put in place, the vertebrae can continue to fracture like dominos, usually one every 6 -12 months.
- Loss of height can be followed by a hump (Dowagers hump) developing on the upper back. When the vertebrae fracture forward this causes the hump.
- The ribs usually end up resting on the pelvic bones, as there is no bone support to keep the body upright.
- When the ribs drop down, this will push the stomach contents forward, causing a pot belly and usually abdominal discomfort. This happens as there is no room for the stomach contents as the ribs have dropped down.
- As the vertebrae collapse, the persons head can begin to protrude forward, which changes the body's centre of gravity, making a person higher risk to have a fall, especially if they are a senior citizen.
- Difficulty in breathing, swallowing and urinary incontinence can happen to those with undiagnosed severe osteoporosis, due to the changes in the person's shape.
- A change in body shape and size (a person can go from size 8 to 18), which can result in difficulty buying clothes that fit properly.

Osteoporosis Risk factors

There are many reasons as to why a person can develop Osteoporosis. Below is a list of some of the risk factors. You will notice that some of these are diseases and some are treatments used to treat other diseases while others are the secondary effects of a disease or lifestyle choice. Not all risk factors have had extensive research however all can place a person at risk of developing osteoporosis.

Family History

Research has shown that a family history of osteoporosis is a very strong risk factor for the disease. 80% of your bone is determined by genetics, therefore, if a parent, grandparent or a close family member suffers/suffered from osteoporosis or had a sign or symptom, then you could be at a higher risk yourself.

Other Diseases/ Illnesses

- Rheumatoid Arthritis
- Eating disorders: People with a past or present eating disorder are at extremely high risk of developing osteopenia / osteoporosis at a very young age.
- Gastrointestinal disorders such as Coeliac disease, Crohn's, Ulcerative Colitis or Primary Biliary Cirrhosis.
- Endocrine disorders such as high levels of Cortisol, Cushing syndrome, Thyroid Hormone problems
- Asthmatics on steroid inhalers
- Diabetics
- Turner's Syndrome
- Klinefelter's Syndrome
- Haemochromatosis
- Bone Marrow disorders
- Connective Tissue disease
- Multiple Sclerosis
- Parkinson's disease
- Scoliosis

Treatments for other illnesses

- Chemotherapy or Radiation: Any adult or child who has received or who will be receiving either treatment is recommended to have a DXA scan and be monitored

- Aromatase inhibitors for cancer of the breast and prostate
- GnRh Analogues used in treatment of endometriosis, or cancer of the prostate
- Corticosteroids such as prednisolone, prednisone or cortisone
- Some Anticonvulsants for epilepsy
- Post organ transplant therapy
- Diuretics such as Lasix & Burinex
- Chronic Heparin or Warfarin
- Antipsychotic medications such as long term Lithium therapy

Lifestyle Factors

- Excessive physiological or psychological stress
- Low body weight: If you are unsure if you are underweight for your height, check with your doctor or a dietician.
- Elite female athletes can develop osteoporosis due to amenorrhoea (loss of periods for more than 4 months, not due to pregnancy). This can be due to a variety of causes which include over training, inadequate nutrition, below normal body weight for their height and eating disorders.
- Lack of regular weight bearing exercise
- Low daily intake or poor absorption of calcium and /or vitamin D
- Intolerance to dairy products
- Vegetarians/vegans who have excessive fibre in their diet and who do not take the daily amount of calcium, vitamin D and protein
- Excessive fibre intake - over 40 grams daily
- Excessive caffeine intake
- Smoking
- Alcohol: Women who regularly consume more than 14 units of alcohol per week and men who regularly consume more than 21 units of alcohol per week are at higher risk. 1 unit is equivalent to a half pint of beer, 1 small glass of wine or 1 measure of spirits.

Secondary Effects

- Those who are wheelchair-bound, bed-bound or who have impaired mobility for more than six weeks or longer e.g. people with Cerebral Palsy, amputees or those who have had a stroke.
- Those who were bed-bound/wheelchair-bound or had impaired mobility in pre-puberty and teenage years or as an adult.

- Sudden, severe episodes of upper, middle or low back pain and/or loss of height (more than 2cm) should be investigated



Additional Risk Factors for Women

The most common cause in women is oestrogen deficiency. This may be due to a variety of causes:

- First period after age 15
- Irregular or no periods for more than four months, not due to pregnancy
- All women who have gone through the menopause, particularly those who have experienced premature menopause (before 45 years)
- Natural menopause i.e. - ovary/ovaries removed/ hysterectomy
- Endometriosis
- Depo Provera contraceptive

Additional Risk Factors for Men

The most common cause of osteoporosis in men is testosterone deficiency (Hypogonadism). Symptoms of this include loss of sex drive, loss of erections, depression, and/or fatigue.

Why do I need Calcium and Vitamin D3?

Typically we reach our peak bone mass by age 25-30, and the density of our bones will depend in part upon the calcium and vitamin D3 intake in childhood and teen years. This is why it is so important that everyone (unless contraindicated by your Doctor)

should be on the daily recommended amounts of calcium and vitamin D3 throughout life.

- Calcium and vitamin D3 are essential nutrients for the prevention **and** treatment of osteoporosis.
- Substantial clinical evidence demonstrates that low calcium and vitamin D intake and/or poor absorption are linked to an increased risk of hip fractures in senior citizens.
- Vitamin D3 is essential for the absorption of calcium, it increases the body's ability to absorb calcium by 30-80%.

Calcium

Calcium is the most common mineral found in our bones and helps to give bones strength and rigidity. It has been said that osteoporosis is a childhood disease that manifests itself in adult years. As children, it is necessary to grow a strong healthy skeleton that will last a lifetime. Calcium is also particularly important at the time of menopause, because calcium absorption slows down, due to low levels of oestrogen. Studies on older adults show that adequate calcium intake and vitamin D3 can lower the risk of fractures.

A deficiency in Calcium can cause bones to become brittle on the inside and therefore they break very easily. Every cell in our body, including those in the heart, nerves and muscles rely on calcium. Calcium is necessary for your body to form blood clots.

NOTE: Calcium alone is not enough to treat bone loss and is not a substitute for drug therapies that treat bone loss.

NOTE: It is essential that calcium is taken in conjunction with Vitamin D3, no one should just be taking calcium.

Calcium Sources

You need to ensure that the food you eat is rich in calcium. Dairy products are one of the best sources of Calcium especially the fortified milks, not only do they have calcium but also have vitamin D. The best sources of calcium are milk, cheese and yoghurt. Bread, nuts and any fish where you can eat the bones (e.g. sardines and tuna) also contain calcium, as do some dark green vegetables. Some brands of orange juice and most breakfast cereals have added calcium.

How much do people need?

Children (1-10 years) 800 mg per day

Teenagers (11-18 years)* 1200 mg per day

Adults (Men) 1000 mg per day

Adults (Women) 1000 mg per day

Pregnant Women (2nd half)* 1200 mg per day

Breastfeeding Women (1st 6 months)* 1500 mg per day

* Teenagers & pregnant/breastfeeding mothers may need to increase to 1500 mg calcium per day if they have Osteopenia and/or Osteoporosis.

* Remember to eat plenty of fresh fruit and vegetables that contain other vitamins and minerals.

CALCIUM CHART

The table below gives an indication of the calcium content in everyday foods. Choosing calcium rich foods will help maintain a healthy skeleton.

Food	Weight	Calcium (mg)
Whole milk	190ml	224
Semi-skimmed milk	190ml	231
Skimmed milk	190ml	235
Soya milk	190ml	25
Goat's milk	190ml	190
Low-fat yoghurt	150g	225
Cheddar cheese	28g	202
Cottage cheese	112g	82
Boiled broccoli	112g	45
Baked beans	112g	59
Large orange	1	58
Dried apricots	100g	170
Brazil nuts	100g	170
Whitebait (fried)	56g	482
Salmon (tinned)	56g	52
Tofu	100g	480
Milk chocolate	56g	123
Ice Cream	112g	134



The servings below, each contain between 250-300mg of calcium. Pregnant women and teenagers require 1200mg/day of calcium and will need at least 5 of these servings to get the recommended daily intake.

- A glass of fortified milk, a matchbox size of cheese and a yoghurt contain between 250-300 mg of calcium.
- A 200ml glass of fortified milk contains approximately 40% of your daily recommended Vitamin D (5ug).
- Combine the above with thirty minutes of weight bearing exercise for adults (sixty minutes for children/teenagers) and this will help to build up your bones and decrease your risk of developing osteoporosis and other conditions.

* All product labels should be checked as amounts vary.

Vitamin D3

Vitamin D3 is an essential part of preventing and treating Osteoporosis. There are several forms of Vitamin D, however in order to maintain healthy bones your body requires the recommended daily allowance of Vitamin D3. Without Vitamin D3, calcium will not be absorbed by your body, which could affect the formation of healthy bones and teeth. Vitamin D3 also helps to regulate cell growth and the immune system.

Vitamin D3 is often referred to as the “sunshine vitamin”. It is critical for calcium absorption as it increases the body’s ability to absorb calcium by as much as 30-80%.

When a person’s skin is exposed to ultraviolet B rays, the skin makes vitamin D. Vitamin D is a fat-soluble vitamin that when consumed or made in the skin, can be stored in the blood and body fat, for several months.

The most important source of vitamin D3 is from the action of sunlight on the skin. Approximately 10-15 minutes of sunlight a day (depending on skin type), on the face and arms during the summer months will enable the body to store vitamin D3. However, it is very important to avoid over-exposure resulting in sunburn, as we are all aware of the damaging effects of the sun, especially in terms of skin cancer.

NOTE: Wearing sun block, make up and/or moisturizers with sun block in them continuously, will stop vitamin D3 absorption or burkas for religious reasons.

A growing number of human metabolic, epidemiologic, and animal studies are indicating that low levels of Vitamin D, appear to be linked to the following conditions: Immune function diseases such as: Type 1 diabetes, multiple sclerosis and rheumatoid arthritis. Some cancers (breast, colon and prostate) but further research is required to prove/understand these links. Low levels of Vitamin D have been linked with TB and causes osteomalacia in adults. A Vitamin D deficiency is thought to mimic the aches and pain symptoms of fibromyalgia.

Babies who are just fed breast milk, consume little vitamin D3, especially if the mother is vitamin D3 deficient. Children who are Vitamin D deficient are at risk of developing Rickets. Some reports have suggested that a number of cases of nutritional rickets have reemerged in Ireland in the last few years. The HSE has implemented

a policy that all infants (0-12 months) should be given a daily vitamin D3 supplement of 5 micrograms vitamin D3, in keeping with Department of Health policy and FSAI recommendations.



Senior citizen's ability to produce vitamin D3 in their skin from the sun, is reduced with age and they are less able to convert it into the Vitamin D hormone that the body needs.

People who are obese are at risk of low Vitamin D levels, as body fat has a tendency to hold onto vitamin D, thus reducing its overall availability to the rest of the body.

Those with darker skin (eg. Africans) do not absorb vitamin D3 from the sun, as easily as lighter skinned people.

Vitamin D3 supplementation has been shown to reduce the risk of fracture and falls and improve muscle function in senior citizens, especially when combined with calcium.

The efficacy of prescription osteoporosis treatments is maximized by osteoporosis patients getting the daily recommended amounts of calcium and vitamin D3.

Lack of absorption of vitamin D can occur in gastrointestinal disorders such as Coeliac Disease (Gluten sensitivity), Crohn's and Ulcerative Colitis or Primary biliary cirrhosis.

Note: People who get the blood test for Coeliac disease and are negative. A person can be gluten sensitive but not a true Coeliac, therefore if a test is negative for Coeliac disease but symptoms persist, a gluten free diet may reduce or eliminate symptoms.

Coeliac/Gluten sensitivity Symptoms - a person can have one or more of these problems:

- Bloating of stomach (after food, especially white bread, pasta, cakes, beer - Foods that contain gluten).
- Stomach pain
- Diarrhoea (Bad smell, loose stools, stools float in toilet, lighter colour)
- Constipation
- Mouth ulcers
- Chronic tiredness
- Anaemia
- Weight loss, bone pain, moodiness or depression



Vitamin D3 can be found in some foods:

- Fish oils and species of fish such as salmon, tuna, sardines, mackerel, halibut and herring, are all excellent sources of vitamin D3.
- Eating oily fish twice a week can help to supply your vitamin D requirements, depending on the portion size.
- Dairy products, margarine, eggs and chicken livers.
- A lot of milk products and margarines are fortified with vitamin D.
- Breakfast cereals, soya milk and rice milk may also be fortified with vitamin D.

NOTE: Please check individual labels for vitamin D amounts as they can vary.

To determine how much vitamin D is needed from food and supplements, the following should be considered:

- Your age, as you age your ability to produce Vitamin D from the sun is reduced.
- The time of year - Summer or winter
- Where you are living - What latitude
- The amount of time you spend outside in the sun
- Use/level of sunscreens
- Make up - Blocks Vitamin D and many have sun block in them
- Skin moisturizers that contain sun block
- Your skin color - darker skinned people absorb less Vitamin D from the sun
- Burkas for religious reasons

How much do you need?

Currently 10ug or 800 international units (iul) are the current recommended daily dose of vitamin D for adults and children. Babies 0-12 months who are breastfeed or formula feed should be given 5ug of vitamin D3 every day.

Remember also to take plenty of fresh fruit and vegetables that contain other vitamins and minerals.

Causes of Low Vitamin D should be Found and Addressed

- Two common reasons for the low levels of vitamin D in Ireland, are the lack of sunshine and the fact that only a few foods naturally contain vitamin D.
- Due to Ireland's northerly latitude, very little UV light is available between October and March, which can result in low levels of Vitamin D.
- The Vitamin D that we store in the summer months, has to last through the winter season. NOTE: We have not had much sun in the summer for years, therefore vitamin D levels may not be met in our "summer" months.
- In Ireland 74% of adults and 88% of primary school children, have less than half of the recommended daily amount of vitamin D.

Pregnancy and taking Vitamin D

All expecting mothers should speak to their doctor about vitamin D3 intake.

Babies need Vitamin D3

- Breast milk, formula milk and solid foods may not have enough or may not have any vitamin D3
- Babies skin is very sensitive to the sun and should not be exposed to direct sunlight
- Between 0-12 months babies are developing and vitamin D3 is essential to form strong healthy bones.

Higher risk babies

Babies who are born to mothers with darker skin (African, middle eastern, Indian etc) may be very low in vitamin D, as vitamin D3 is more difficult to absorb for those with darker skin color.

What type of Vitamin D3 should be given to babies?

Vitamin D3 is the preferred form of vitamin D for infants. The vitamin D3 product you buy should be in a liquid form and only contain vitamin D3.

NOTE: Multivitamins that contain Vitamin D3 are not recommended.

How do you give a baby Vitamin D drops?

Check the product label for the number of drops or amount of liquid you need to give the baby. The correct amount is 5 micrograms (5Qg). Give the baby the correct dose directly into their mouth. If you forget to give your baby their daily Vitamin D3, then start again the next day but do not give more than one dose per day.

Where can I get Vitamin D3 for babies?

You do not need a prescription to buy Vitamin D3 products that are suitable for babies. These products are not available on the medical card or any other state drug scheme. You can ask your pharmacist what vitamin D3 products recommended by the HSE for babies they have available. It is important that you buy products that are suitable for babies, and only contain Vitamin D3.

NOTE: The recommended dose of Vitamin D for adults and children maybe increased in the near future.

Taking Calcium and Vitamin D3 Supplements

There may be inadequate amounts of Calcium and Vitamin D3 in the diet, and supplementation is necessary when dietary intake of Calcium and especially vitamin D is inadequate.

There are many different types of Calcium and Vitamin D3 supplements available – as a drink or chewable tablet. Some of the common ones are listed below. Speak to your doctor about your preference.

Depending on whether you have been prescribed a drink or a chewable tablet, you will need to take your supplement once or twice a day – your doctor will let you know which.

- Drinks are taken either once or twice a day depending on the make and your requirements – your doctor will let you know how often you need to take it
- Tablets are usually taken twice a day, once in the morning and once in the evening, and can be chewed and swallowed with or without water. Directions will also be on the packet

For example:

Osteofos D3 drink – once daily

Calcichew D3 Forte chewable tablet – twice daily

Ideos chewable tablet – twice daily

Osteocare chewable tablet – twice daily

Calcium and Vitamin D 3 Supplements

To avoid constipation problems while taking calcium supplements, make sure to take plenty of fluids throughout the day (2 litres is recommended, preferably water). Always consult your Doctor before taking any new medication, supplement or increased fluid intake.

Some tips for getting the most from your supplement

- Always read the patient information leaflet provided with your supplement
- Take with food to help absorption
- Do not take at the same time as your osteoporosis prescribed medication or with any other supplements
- Put a reminder note on the fridge or keep your tablets next to something that is used regularly e.g. the kettle or car keys
- Your supplement should contain the recommended daily amount of Calcium and Vitamin D3, so it is advised not to take any other Calcium and Vitamin D3 supplements along with it.
- Speak to a healthcare professional if you have any concerns regarding your treatment or experience any side effects.

Vegetarians/ Vegans

Vegetarians with a low intake of calcium, as well as vegans, need to calculate their average daily intake of calcium from food sources and may have to maximise their intake by taking a calcium supplement. Vegans should use milk substitutes that are fortified with calcium like soya and rice milk. A calcium and vitamin D supplement should also be taken if intake is low.

DXA Scanning

If you have one or more risk factors, we recommend that you speak to your doctor about your risk of breaking a bone. A DXA scan of your spine and hips is the gold standard for diagnosing osteoporosis and is highly recommended if you are at risk. Otherwise you will not know whether or not you have osteoporosis as it is a silent disease. Based on your results, you can then help prevent its onset or if you have osteopenia/osteoporosis, you can prevent further deterioration and increase your bone strength. If your DXA scan is negative, it is essential that you ensure to take the daily amounts of calcium, vitamin D and weight bearing exercise to prevent developing osteoporosis.

**If you would like more information on
Osteoporosis for yourself or a family member
please contact:**

The Irish Osteoporosis Society

12 Burlington Road,
Garden Level,
Dublin 4.

Low call: 1890 252 751

Tel: 01 637 5050

Email: info@irishosteoporosis.ie

www.irishosteoporosis.ie

Aims of the Irish Osteoporosis Society

- To prevent the incidence of osteoporosis in Ireland by increasing the awareness of the risk factors for osteoporosis.
- To provide support, advice and information for people suffering from osteopenia/osteoporosis
- To distribute up-to-date information to doctors and health care workers on current methods of prevention and treatment
- To encourage research into this area in Ireland

Services available to IOS members

- Helpline
- Website
- Newsletter
- Osteoporosis Awareness groups
- Lectures
- Public meetings
- Awareness campaigns
- Health Promotions

Additional information available

- Fall Prevention leaflet
- Fall prevention poster for GP offices, senior centres etc
- Osteoporosis Guidelines for Health Professionals
- Osteoporosis guidelines for patients
- Exercise leaflet
- Nutrition leaflet
- DVD for 12-18 year olds
- Power point for 12-18 year olds
- Bones book by Brent Pope for 7-12 year olds
- Usual suspects poster

Calcium and Vitamin D3 Membership and Donation Form

(PLEASE PRINT)

Mr/Mrs/Miss/Ms/Dr

Company (if relevant):

Address:

Telephone No:

Mobile No:

Email:

Date of Birth:

- I wish to join the society
- I wish to renew my membership
- Receive more information from the Irish Osteoporosis Society
- Attend a 1-evening information class on Osteoporosis
- Volunteer time for the Irish Osteoporosis Society
- Promoting Osteoporosis awareness in my area
- Participating/selling raffle tickets for the Irish Osteoporosis Society
- Information on Legacies

I enclose the following subscription:

- €25 Charity Member

Name:

Address:

Telephone No:

Email:

In addition, I would like to make a donation to the Irish Osteoporosis Society in the amount of:

- €1000
 €500
 €250
 €100
 €50
 €25
 €10

Other €

Payment Details

Payment: please make cheques/PO payable to:
The Irish Osteoporosis Society and crossed 'Account payee only'.

Cheque Postal Order Visa MasterCard Laser

Card Number:

Expiry Date:

Total Amount: €

Thank you for your support!

Please send this form and appropriate amount to:

The Irish Osteoporosis Society,
12 Burlington Road,
Garden Level,
Ballsbridge,
Dublin 4.

Tel: Lo-call 1890 252751

Tel: 01 637 5050

Fax: 01 6680098.

Email: info@irishosteoporosis.ie.

Web: www.irishosteoporosis.ie



For more information, contact:

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