Osteoporosis

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What is Osteoporosis and Osteopenia?

Osteoporosis is a non-painful condition where, over time, bones become weaker, thinner and fragile due to a reduction in the quality and quantity of bone. The bones lose minerals such as calcium, leading to low bone mineral density. The thinner and weaker bone is more likely to break, which can lead to persistent pain, significant disability, reduced independence and reduced life expectancy. Osteoporosis is often not diagnosed until fracture occurs

which means opportunities for treatment and prevention are not utilised.



Osteopenia is the precursor to osteoporosis. In osteopenia there is lower bone mineral density than normal but not low enough to be classified as osteoporosis.

Why is Osteoporosis important?

Osteoporosis is a very common condition. It affects approximately 2.2 million Australians. In Australia, 27% of women and 11% of men over the age of 60 have osteoporosis.

People with osteoporosis were 2.7 times more likely to describe their health as poor and 2.9 times more likely to experience high levels of psychological distress. (4)



Of people reaching 50 years of age, the lifetime risk of fracture due to osteoporosis is 42% in women and 27% in men.

Bone health and how osteoporosis develops

Our bones develop and grow from childhood until our early 20s, when peak bone mass is achieved. At this age our bones are at their strongest and least likely to fracture.

Throughout life, old bone is constantly being replaced with new bone. The body naturally strengthens areas of bones that are regularly put under load, laying down new bone and breaking down the old bone. This process keeps our skeleton strong.

In osteoporosis significantly more bone is broken down thanis replaced with new bone, causing the bone to progressively become more brittle and more likely to break.

The Structure of a bone



Cortical bone is the outer layer of the bone. It is very strong especially when under compression forces along the length

of the bone. With osteoporosis this outer layer of bone becomes thinner.

Trabecular bone lies inside the cortical bone and has a honeycomb-like structure. This structure is formed based on the stress placed on the bone e.g. muscles contracting pull on the bones to stimulate the formation of bone in a structure supporting these forces. In osteoporosis there is a reduction in the density of the trabecular bone.

Common areas affected by osteoporosis

Osteoporotic fractures most commonly occur at the hip, spine and wrist and these are the areas that are checked during a bone scan for osteoporosis. Fractures of the spine are the most common of the three but are often undiagnosed, being dismissed as back pain due to ageing.



Fractures of the spine can lead to loss of height of the vertebrae and increased curvature of the spine. These symptoms are often attributed to poor posture and part of the aging process but in fact may be due to wedge fractures and crush fractures to the vertebrae. Fractures of the hip can lead to significant disability, often taking 6-12 months to recover from and sometimes requiring surgery to stabilise the area. Less than 50% of people who suffer hip fracture return to their preinjury autonomy and roughly 10-20% of patients die within 1 year of having a hip fracture.



Risk Factors for Osteoporosis

Lifestyle Factors

- Low levels of physical activity
- Smoking
- Excessive alcohol intake
- Low Vitamin D levels (lack of sun exposure)



- Caffeine intake greater than equivalent to 3 standard cups of coffee per day
- Bodyweight (thin build BMI < 19 or obesity BMI > 30). To check your BMI click <u>here</u>.
- Low Calcium levels (body not absorbing enough calcium from diet)
- Factors related to diseases and medication use
 Long-term use of Corticosteroid medications, antiepileptic medications, cytotoxic agents
 Thyroid, Kidney and Liver Disease
- Chronic Obstructive Pulmonary Disease (COPD), Cushing syndrome, Multiple Sclerosis
- Diseases that affect your ability to absorb nutrients like Crohn's Disease or Celiac Disease

For more details of disease and medications interactions with osteoporosis see your GP

How can osteoporosis be treated?

Early in life

With osteoporosis, prevention is the best strategy. In youth it is important to engage physical activity and develop good diet habits to maximise peak bone mineral density and prevent premature

The following lifestyle factors are

bone loss.

recommended:

- Ensure a diet with enough calcium and protein
- Get enough vitamin D from either sunlight and enhancing your intake from specific foods (e.g. Salmon, Vitamin D fortified milk, etc)



- Maintain a healthy weight i.e. not too thin (not <19 BMI) or obese (not >30 BMI)
- Stay active. It is very important to be doing some muscle strengthening exercise.
- Avoid smoking and heavy drinking
- Be aware of the risk factors for osteoporosis and consult a health professional if you think you are at risk.

Later in life

Early diagnosis is the key to good management of osteoporosis later in life. If your GP suspects you have osteoporosis you will be sent for a DEXA bone scan to assess your bone density.



Any fractures should be assessed as they can lead to significant disability if not managed properly.

To manage osteoporosis over the long-term, a tailored exercise program is extremely important. The program should aim to strengthen your muscles and stimulates laying down new bone.



A fall prevention program will improve your balance and body awareness in order to reduce the chance of falls occurring.



A proper assessment of your diet is important to make sure you are getting adequate calcium and protein and to help maintain a healthy bodyweight.



Lastly some medications may help slow the

breakdown of old bone and thus slow the progress of osteoporosis. Consult your GP to check if medication may be appropriate for you.



I had a DEXA bone scan what do the results mean?

A DEXA (Dual-Energy X-ray Absorptiometry) bone scan checks the bone mineral density at 3 sites in your body (hip, spine and wrist). They then provide two scores: a T-score and a Z-Score, for each



T-Score

The T-Score provides a comparison of your bone mineral density compared to peak bone mass. E.g. A 68yr old female getting a DEXA bone scan bone density would be compared to that of a 20 yr old female. This gives an overview of the general bone health and is used to diagnose osteoporosis/osteopenia. It also provides an indication of your risk of osteoporotic fracture which doubles every -1 point below normal.

Z-Score

Z-score provides a comparison to average population of the same age and sex. This is important as bone mineral density naturally declines with age.

A 68yr female getting a DEXA bone scan bone density would be compared to that of the average 68yr female.

References

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