

Bone density testing

Bone density testing is a medical procedure used to determine bone density or strength. It can identify osteoporosis (when bones become less dense, lose strength and break more easily due to calcium loss) or osteopaenia, a milder form of bone loss.

There are various different procedures that can measure bone density. The majority of these procedures are quick and pain-free. Dual energy x-ray absorptiometry (DEXA), which uses a special x-ray scanning machine to measure bone density, is the most popular technique as it is fast and highly accurate. Another name for bone density testing is bone mass measurement.

When bone density testing is performed

Bone density testing is most often used when people have:

- Osteoporosis, or are postmenopausal and concerned about osteoporosis
- A vertebral (spinal) deformity
- Osteopaenia (decreased bone density)
- A previous fracture.

Osteoporosis is common in the elderly, particularly females. Certain diseases and conditions can also contribute to bone loss, including endocrine (hormonal) disease, chronic liver disease, rheumatoid arthritis and chronic renal failure.

Medical issues to consider

Before undergoing the test, you will need to discuss a range of issues with your doctor, including:

- Medical history
- Your risk factors for bone disease
- Whether or not you are pregnant (pregnant women should not undergo bone density testing)
- Any special instructions prior to the test.

Test procedures

In most cases, you will be asked to undress and put on a hospital gown. All jewellery has to be removed prior to the test. There are several procedures which can be used to measure bone density, including:

- **Dual energy x-ray absorptiometry** (DEXA) – x-ray beams of differing energy are used to detect bone and soft tissue density separately. This technique can be used to measure bone density in the spine, hip, forearm and the total body. It is one of the most common methods to determine bone density as it is fast and highly accurate.
- **Single energy x-ray absorptiometry** – a single x-ray beam is used to measure bone density at peripheral sites like the forearm and heel. In this technique, the area to be tested is wrapped in a tissue-like substance or immersed in water to improve the quality of the results.
- **Ultrasound** – measurements taken during an ultrasound may provide data on the structural integrity of bone. New ultrasound devices such as quantitative ultrasound (QUS) can estimate bone density of the heel within minutes, providing an automatic print-out of results.

Immediately after the procedure

Most bone density scans take around half an hour or so and you can go home straight away. You will have to make a follow-up appointment with your doctor to discuss your results.

What the measurements mean

Bone density measurements are reported as a value in g/cm² and as a T-score or Z-score, which describes your bone density measurement in relation to other people in a similar group – known as the ‘reference population’.

The reference population for the T-score is young adults of the same sex as the patient, while the reference population for the Z-score is a group of the same age and sex as the person being tested. Osteoporosis is diagnosed if your T-score is -2.5 or less.

Possible complications for bone density testing

Bone density testing is a safe procedure and the dose of radiation is roughly the same as you would receive from the general environment in about one day.

Taking care of yourself at home

Bone density testing is a safe and painless procedure with no after-effects. You can resume your normal activities as soon as the test is finished.

Long-term outlook

If you have osteoporosis, for example, you may need to have repeat bone density tests to make sure your treatment is helping to preserve the integrity of your bones. Try to have all future tests at the same testing facility using the same machine. This will rule out the possibility of any measurement differences between machines or facilities.

Other types of tests

Standard x-rays can only detect osteoporosis when around one-third of the bone mass has already gone. This means that x-rays cannot detect osteoporosis in its earlier stages. However, your doctor may request regular x-rays to make sure your symptoms aren't caused by some other kind of condition or to check for bone fractures.

Where to get help

- Your doctor
- Osteoporosis Victoria (a division of Arthritis Victoria) Tel. (03) 8531 8099

Things to remember

- Bone density testing is a medical procedure used to determine bone density or strength.
- It can identify osteoporosis or osteopaenia and the risk of future bone fractures.
- There are different procedures that can measure bone density and the majority are quick and pain-free.

This page has been produced in consultation with, and approved by:

Monash University - Department of Medical Imaging and Radiation Sciences

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