Bone Mineral Densitometry (BMD)

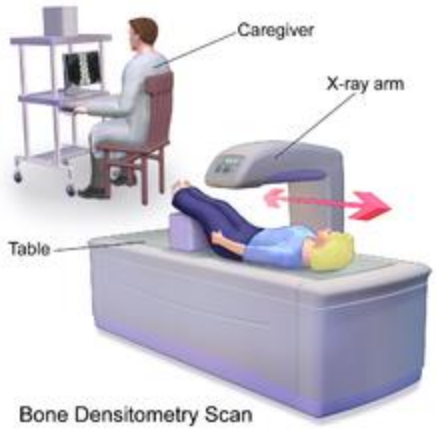
How to Prepare

- Don’t take calcium supplements for 24 hours before the exam.
- Avoid wearing clothes with metal zippers, belts, or buttons.
- If you’ve had an injection of barium or contrast dye for a CT scan or MRI, wait 7 days before having a central DXA. The contrast dye could interfere with your bone density test.

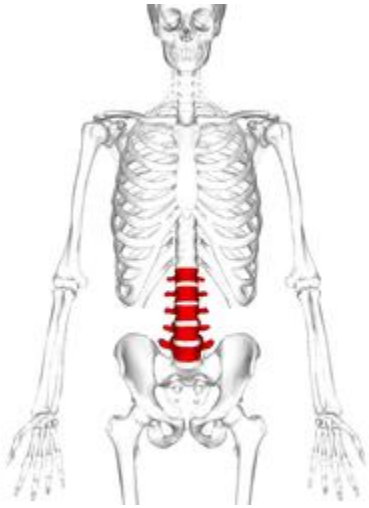
How Often Should I Get Tested?

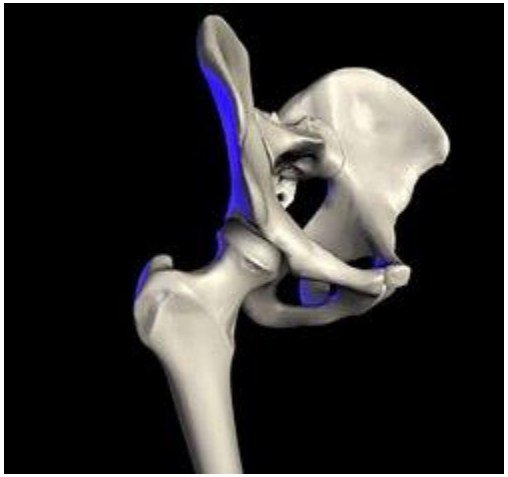
- If you are taking medication for osteoporosis, expect to have a bone density test every 1 to 2 years.
- Even if you don't have osteoporosis, a bone density test every 2 years, especially for women during or after menopause.

osteo



Bone Densitometry Scan





Indications for testing

- females age 65 or older[1]
- males age 70 or older
- people over age 50 with any of the following:
  - previous bone fracture from minor trauma[
  - rheumatoid arthritis[1]
  - low body weight
  - a parent with a hip fracture
- Individuals with vertebral abnormalities.
- Individuals receiving, or planning to receive, long-term glucocorticoid (steroid) therapy.
- Individuals with primary hyperparathyroidism.
- Individuals being monitored to assess the response or efficacy of an approved osteoporosis drug therapy.
- Individuals with a history of eating disorders
- Other considerations that are related to risk of low bone density and the need for a test include smoking habits, drinking habits, the long-term use of corticosteroid drugs, and a vitamin D deficiency.

Results are often reported in 3 terms:

1. Measured areal density in g cm^{-2}
2. Z-score, the number of standard deviations above or below the mean for the patient's age, sex and ethnicity
3. T-score, the number of standard deviations above or below the mean for a healthy 30-year-old adult of the same sex and ethnicity as the patient

Types of tests

- Dual-energy X-ray absorptiometry (DXA or DEXA)
- Dual X-ray Absorptiometry and Laser (DXL)
- Quantitative computed tomography (QCT)
- Quantitative ultrasound (QUS)
- Single photon absorptiometry (SPA)
- Dual photon absorptiometry (DPA)
- Digital X-ray radiogrammetry (DXR)
- Single energy X-ray absorptiometry (SEXA)

T-score

- The T-score is the relevant measure when screening for osteoporosis.
- It is the bone mineral density (BMD) at the site when compared to the young normal reference mean.
- It is a comparison of a patient's BMD to that of a healthy 30-year-old
- The US standard is to use data for a 30-year-old of the same sex and ethnicity, but the WHO recommends using data for a 30-year-old white female for everyone

The criteria of the World Health Organization are

- Normal is a T-score of −1.0 or higher
- Osteopenia is defined as between −1.0 and −2.5
- Osteoporosis is defined as −2.5 or lower, meaning a bone density that is two and a half standard deviations below the mean of a 30-year-old man/woman.

Limitations

- Measurement can be affected by the size of the patient, the thickness of tissue overlying the bone, and other factors extraneous to the bones
- there are some circumstances in which bone density is a poorer indicator of bone strength.

- Reference standards for some populations (e.g., children) are unavailable for many of the methods used.
- Crushed vertebrae can result in falsely high bone density, so they must be excluded from analysis.

Z-score

- The Z-score is the comparison to the age-matched normal and is usually used in cases of severe osteoporosis.
- This is the number of standard deviations a patient's BMD differs from the average BMD of their age, sex, and ethnicity.
- This value is used in premenopausal women, men under the age of 50, and in children
- It is most useful when the score is less than 2 standard deviations below this normal

What Your Results Mean

- You'll get 2 scores after your bone density test:

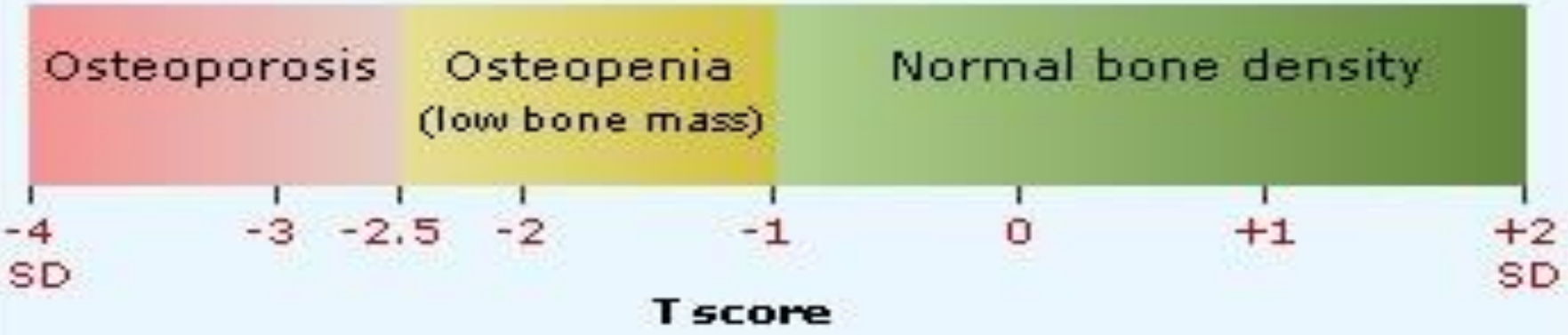
Here's what the T score means:

- -1 and above: Your bone density is normal
- ● -1 to -2.5: Your bone density is low, and it may lead to osteoporosis
- **-2.5 and above:** You have osteoporosis

Z score:

- A Z score below -2.0 means that you have less bone mass than someone your age and that it could be caused by something other than aging.

WHAT YOUR T SCORE MEANS



T scores are measured in standard deviations (SD), statistical measures that reflect the difference between your bone density and the average bone density for healthy young adults of your sex.