

Strategies for Osteoporosis Bone Mass Measurement: What the Numbers Mean

When a patient asks the question, “I am confused about my bone density test results – what do the different numbers mean?” They want to know exactly that —the numbers. Though a bone mineral density test (BMD) is non-invasive and painless, sometimes the results can be scary because the numbers are hard to understand.

A BMD is the best way for a patient to determine their bone health. BMD tests can identify osteoporosis, determine risk for fractures and monitor a patient’s response to an osteoporosis treatment. Different BMD tests may measure the hip or spine, a wrist, finger, shin bone or heel.

A patient’s BMD is compared to two norms, “young normal” and “age-matched.” Young normal, known as the T-score, compares a patient’s BMD to optimal or peak density of a 30-year old healthy adult and determines someone’s fracture risk, which increases as BMD falls below young-normal levels. Age-matched, known as the Z-score, compares a patient’s BMD to what is expected in someone the same age and body size of the person being tested. Among older adults, however, low BMD is common, so comparison with age-matched norms can be misleading.

The difference between your BMD and that of a healthy young adult is referred to as a standard deviation (SD). As outlined in the World Health Organization’s diagnostic categories, individuals whose T-score is within one standard deviation of the “norm” are considered to have normal bone density.

Scores below the “norm” are indicated in negative numbers. For example, a score from -1 to -2.5 SD below the norm indicates low bone mass, or osteopenia, and a score of more than -2.5 SD below the norm is considered a diagnosis of osteoporosis. For most BMD tests, -1 SD equals a 10-12% decrease in bone density.

The NOF *Physician’s Guide to Prevention and Treatment of Osteoporosis* suggests BMD testing for the following postmenopausal women:

- Those with one or more additional risk factors for osteoporotic fracture (besides menopause);
- Those who have had a fracture (broken bone) to determine if osteoporosis is the underlying cause;
- Those who are ages 65 and older, regardless of other risk factors;
- Those who are considering therapy for osteoporosis, if BMD testing will facilitate the decision; and
- Those who have been on hormone replacement therapy for prolonged periods.

The information provided by a BMD test can help your doctor decide which prevention or treatment options are right for you.

World Health Organization Definitions of Osteoporosis Based on Bone Density Levels	
<i>Normal.</i>	Bone density is within 1 SD (+1 or -1) of the young adult mean.
<i>Low Bone Mass.</i>	Bone density is 1 to 2.5 SD below the young adult mean (-1 to -2.5 SD).
<i>Osteoporosis</i>	Bone density is 2.5 SD or more below the young adult mean (> -2.5 SD).
<i>Severe (established) osteoporosis.</i>	Bone density is more than 2.5 SD below the young adult mean and there has been one or more osteoporotic fractures.

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