



## Bone Mass Measurement: What the Numbers Mean

### National Institutes of Health Osteoporosis and Related Bone Diseases National Resource Center

2 AMS Circle  
Bethesda, MD 20892-3676

**Phone:** 202-223-0344  
**Toll free:** 800-624-BONE  
**TTY:** 202-466-4315  
**Fax:** 202-293-2356

**Website:** [www.bones.nih.gov](http://www.bones.nih.gov)  
**Email:** [NIHBoneInfo@mail.nih.gov](mailto:NIHBoneInfo@mail.nih.gov)

The NIH Osteoporosis and Related Bone Diseases National Resource Center is supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases with contributions from the National Institute on Aging, the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, the National Institute of Dental and Craniofacial Research, the National Institute of Diabetes and Digestive and Kidney Diseases, the NIH Office of Research on Women's Health, and the HHS Office on Women's Health.

The National Institutes of Health (NIH) is a component of the U.S. Department of Health and Human Services (HHS).

June 2015

### What Is a Bone Density Test?

A bone mineral density (BMD) test can provide a snapshot of your bone health. The test can identify osteoporosis, determine your risk for fractures (broken bones), and measure your response to osteoporosis treatment. The most widely recognized BMD test is called a central dual-energy x-ray absorptiometry, or central DXA test. It is painless—a bit like having an x ray. The test can measure bone density at your hip and spine.

Peripheral bone density tests measure bone density in the lower arm, wrist, finger, or heel. These tests are often used for screening purposes and can help identify people who might benefit from additional bone density testing.

### What Does the Test Do?

A BMD test measures your bone mineral density and compares it to that of an established norm or standard to give you a score. Although no bone density test is 100-percent accurate, the test is an important predictor of whether a person will have a fracture in the future.

### The T-Score

Most commonly, your BMD test results are compared to the ideal or peak bone mineral density of a healthy 30-year-old adult, and you are given a T-score. A score of 0 means your BMD is equal to the norm for a healthy young adult. Differences between your BMD and that of the healthy young adult norm are measured in units called standard deviations (SDs). The more standard deviations below 0, indicated as negative numbers, the lower your BMD and the higher your risk of fracture.

As shown in the table on page 2, a T-score between +1 and -1 is considered normal or healthy. A T-score between -1 and -2.5 indicates that you have low bone mass, although not with osteoporosis. A T-score of -2.5 or lower indicates that you have osteoporosis. The greater the negative number, the more severe the osteoporosis.

### Low Bone Mass Versus Osteoporosis

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 Based on Bone Density Levels

Level	Definition
<b>Normal</b>	Bone density is within 1 SD (+1 or -1) of the young adult mean.
<b>Low bone mass</b>	Bone density is between 1 and 2.5 SD below the young adult mean (-1 to -2.5 SD).
<b>Osteoporosis</b>	Bone density is 2.5 SD or more below the young adult mean (-2.5 SD or lower).
<b>Severe (established) osteoporosis</b>	Bone density is more than 2.5 SD below the young adult mean, and there have been one or more osteoporotic fractures.

If you have low bone mass that is not low enough to be diagnosed as osteoporosis, this is sometimes referred to as osteopenia. Low bone mass can be caused by many factors such as:

- heredity
- the development of less-than-optimal peak bone mass in your youth
- a medical condition or medication to treat such a condition that negatively affects bone
- abnormally accelerated bone loss.

Although not everyone who has low bone mass will develop osteoporosis, everyone with low bone mass is at higher risk for the disease and the resulting fractures.

As a person with low bone mass, you can take steps to help slow down your bone loss and prevent osteoporosis in your future. Your doctor will want you to develop—or keep—healthy habits such as eating foods rich in calcium and vitamin D and doing weight-bearing exercise such as walking, jogging, or dancing. In some cases, your doctor may recommend medication to prevent osteoporosis.

**Osteoporosis.** If you are diagnosed with osteoporosis, these healthy habits will help, but your doctor will probably also recommend that you take medication. Several effective medications are

available to slow—or even reverse—bone loss. If you do take medication to treat osteoporosis, your doctor can advise you concerning the need for future BMD tests to check your progress.

## Who Should Get a Bone Density Test?

The U.S. Preventive Services Task Force recommends that all women over age 65 should have a bone density test. Women who are younger than age 65 and at high risk for fractures should also have a bone density test.

Due to a lack of available evidence, the Task Force did not make recommendations regarding osteoporosis screening in men.

Various professional medical societies have established guidelines concerning when a person should get a BMD test. Many of these guidelines can be found by conducting a search in an online database established by the National Guideline Clearinghouse at [www.guideline.gov](http://www.guideline.gov).

### For Your Information

This publication contains information about medications used to treat the health condition discussed here. When this publication sheet was developed, we included the most up-to-date (accurate) information available. Occasionally, new information on medication is released.

For updates and for any questions about any medications you are taking, please contact the Food and Drug Administration toll free at 888-INFO-FDA (463-6332) or visit its website at [www.fda.gov](http://www.fda.gov). For additional information on specific medications, visit [Drugs@FDA](mailto:Drugs@FDA) at [www.accessdata.fda.gov/scripts/cder/drugsatfda](http://www.accessdata.fda.gov/scripts/cder/drugsatfda). [Drugs@FDA](mailto:Drugs@FDA) is a searchable catalog of FDA-approved drug products.

NIH Pub. No. 15-7877-E