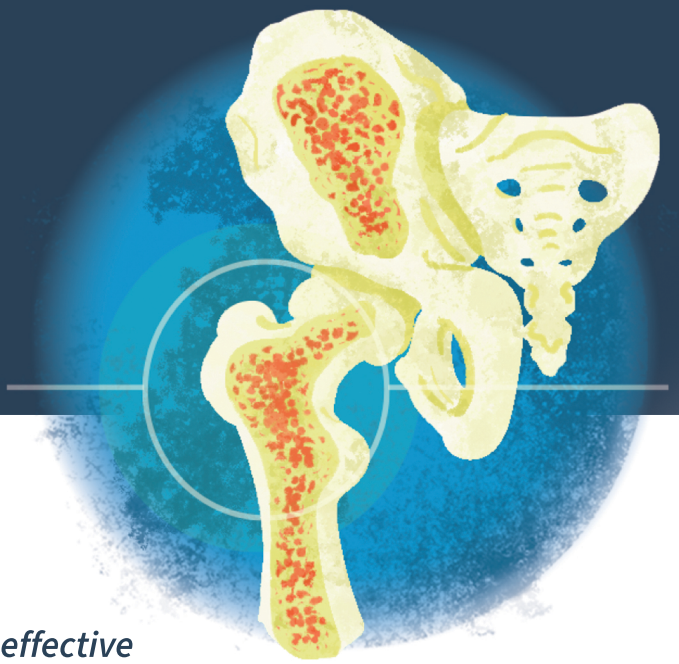
MEDPAGETODAY®
MEDICAL JOURNEYS
IN OSTEOPOROSIS



How Osteoporosis Is Diagnosed and Treated

Screening for this bone disease is essential; therapy is effective

By Diana Swift
Reviewed By Ann Kearns, MD, PhD, Associate Professor of Medicine, Emeritus, Mayo Clinic Rochester, Minnesota

Osteoporosis affects both women and men and all races/ethnicities. Besides costing the U.S. healthcare system billions of dollars a year, this bone disease takes a tremendous toll on the lives of people suffering from it. It is therefore essential to diagnose and treat osteoporosis before it becomes debilitating and leads to multiple fractures and hospitalizations.

Screening

Bone density declines as people age, and women are particularly at risk for fragile bones after menopause when the levels of the hormone estrogen drop sharply. All women age 65 and older should be assessed for bone density, and sooner if they have had a fracture in adulthood. Men age 70 and up should also be screened. It is important to ask your doctor to set up a test if your bone density has not been evaluated.

Diagnosis

Bone density is most often determined by a low-radiation scan known as axial dual-energy x-ray absorptiometry, or DXA, which measures areal bone density — i.e., the amount of bone mineral seen divided by the area of bone scanned.

Results are usually reported as T-scores. In women these compare your bone density with the average value of a healthy young woman. With zero being the value for a woman age 25 to 35, a minus T score of –1 to –2.5 indicates a condition called osteopenia, which suggests low bone density but not quite full-blown osteoporosis. A T score of –2.5 or lower indicates bone density low enough to be categorized as osteoporosis.

Every 1-point drop below 0 doubles the risk of a fracture. And a patient is generally considered to have osteoporosis even when a subsequent test shows a T-score above –2.5 if that patient has had a previous T-score of –2.5 or a fracture in adulthood.

Another assessment measure is the Z-score, which evaluates your bone density above or below that of the average person of the same age, sex, and ethnicity. The normal range for the Z-score is –2.0 to +2.0. This is not generally useful for postmenopausal women.

Newer approaches that are not yet widely used include magnetic resonance imaging and computed tomography scanning. In addition, a newer measurement called the trabecular bone score can assess the quality, not just the quantity, of bone at a given site.

Pharmaceutical Treatments

In addition to weight-bearing exercise and calcium and vitamin D in the diet and from supplements, there are many effective medications that can slow the progression of osteoporosis and ward off fractures.

Some of these treatments are especially effective in the spine, and others at different sites in the skeleton. Some medications work by slowing the breakdown and loss of old bone due to the action of cells called osteoclasts, while others help to increase new bone formation through other cells called osteoblasts. Other medications do both.

But treatments do not cure osteoporosis, and the condition will return when treatment stops. The specific medication prescribed may depend on a patient's risk of fracture or menopausal status. Some treatments are given intermittently or for a limited period of time. When one medication is stopped, another may be prescribed.

The following are among the options:

- **Bisphosphonates:** These include zoledronic acid (Zometa), alendronate (Fosamax), ibandronate (Boniva) and risedronate (Actonel). They slow bone loss by promoting the death of osteoclast cells. Bisphosphonates can reduce the risk of spinal fractures by 50-60% and hip fractures by 50%. Taken once a day as a pill or once a month as an intravenous infusion, bisphosphonates have several side effects, including heartburn when taken orally and flu-like symptoms after infusion. Cautions, however, are that these agents may also impede healing after dental work and can promote stress fractures after long-term use; they are generally used intermittently for 5-8 years, followed by 1 or more years off medication.

- **Calcitonin** is a manufactured imitation of a human hormone that helps maintain normal blood levels of calcium, which is crucial for bone health. Used with calcium/vitamin D supplements, this drug is well tolerated and is available by daily injection or in a once-a-day nose spray. It can cut the risk of spine fractures by 25%. However, this medication is not used often because some studies associated its use with cancer.

- **Denosumab** (Prolia), a manufactured antibody, is given as an under-the-skin injection every 6 months. Because it suppresses the cells that break down bone, denosumab can reduce the risk of spine fractures by up to 60% and hip fractures by 50%. Side effects include skin reactions such as rash or eczema at the site of injection and a slight risk of infection.

- **Parathyroid hormone** (PTH) analogs, derived from a natural hormone produced in the body by tiny glands near the thyroid in the neck, work to stimulate bone production rather than slow bone breakdown.

- **Teriparatide** (Forteo) and **abaloparatide** (Tymlos): Similar in effect to that of natural PTH, teriparatide and abaloparatide, also man-made drugs, work by stimulating new bone growth. Designed to treat patients at high risk for fracture, they are given by injection under the skin for up to 2 years, followed by other medications to hold on to the bone that was made. Side effects may include skin reactions at the injection site, bone pain, and higher levels of calcium in the blood and urine.

- **Raloxifene** (Evista) is a once-a-day pill that slows bone loss and can reduce fractures in the spine by 30% but not those at other sites. Raloxifene is a selective estrogen related medication It blocks the action of this hormone in some tissues, while stimulating its beneficial impact on others such as bone. It can also reduce breast cancer risk, but may cause hot flashes and increase the risk of blood clots. It is not used for premenopausal women.

- **Reproductive hormones** (oral and transdermal formulations). In women, starting estrogen therapy soon after menopause can help maintain bone density and reduce fracture risk. Although estrogen was once considered the treatment of choice for postmenopausal osteoporosis, since this hormone may increase the risk of breast cancer and blood clots, it is generally reserved for bone health in younger women or in women who need treatment for menopausal symptoms. In older men with declining testosterone levels, testosterone-replacement therapy may improve the symptoms of low testosterone, including bone loss. Testosterone is not approved for treating osteoporosis.

- **Romosozumab** (Evenity), the newest bone-building medication for osteoporosis, is suitable for patients who have already broken a bone and are at risk for another fracture. This antibody blocks the action of sclerostin, a protein in bone cells that regulates skeletal breakdown by increasing the action of osteoclasts. Romosozumab both stimulates new bone production and slows down old bone resorption and has been found to be especially effective for preventing spinal fractures. The drug is given in monthly injections and is limited to 1 year of treatment. Side effects can be serious, including dental and jaw problems.