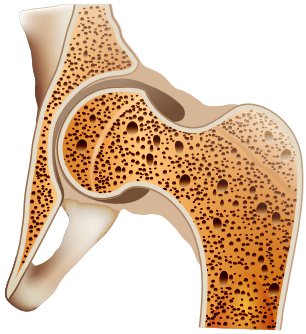
USF Health

OSTEOPOROSIS IN MEN

USF DIABETES AND ENDOCRINOLOGY CENTER / OSTEOPOROSIS PROGRAM

Normal Bone



Bone with Osteoporosis

Osteoporosis is a **silent disease** until it is complicated by fractures that occur following minimal trauma or, in some cases, with no trauma and is characterized by **low bone mass** and **micro-architectural deterioration of bone** tissue with a consequent increase in bone fragility and susceptibility to fracture.

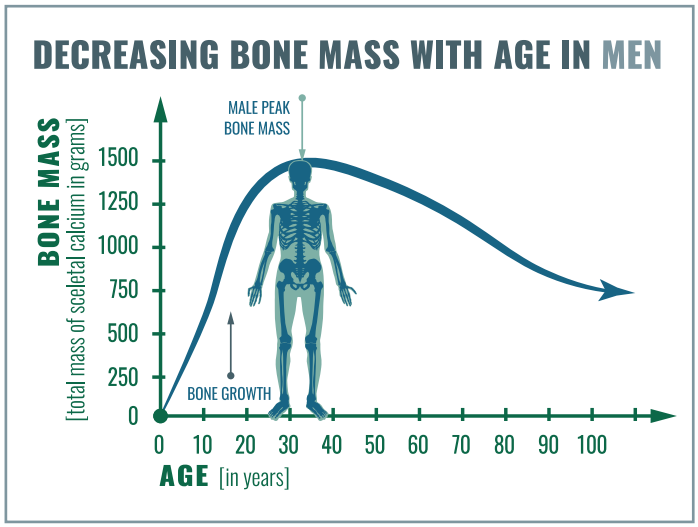
- Osteoporosis can lead to a decrease in bone strength that can increase the risk of broken bones (fractures).
- Osteoporosis is a major cause of fractures in postmenopausal women and in older men. These fractures can occur in any bone but are most common in bones of the hip, vertebrae in the spine, and wrist.
- Every fragility fracture can affect quality of life, mobility and independence and increases risk of the next fracture.

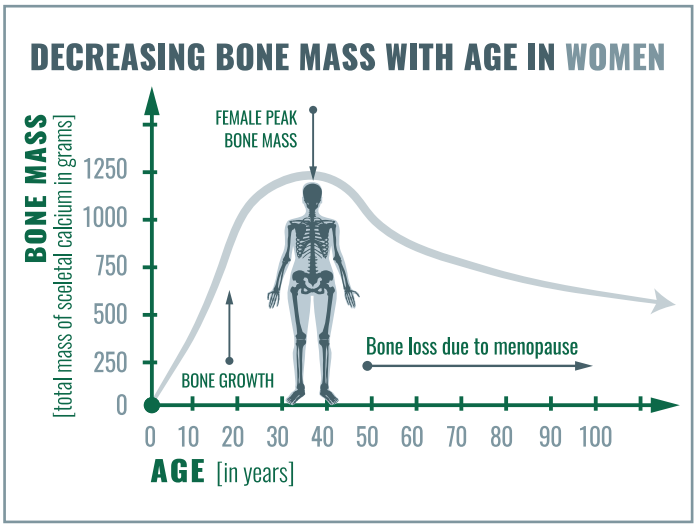
How often does osteoporosis occur in men?

- 4-6% of men older than 50 have osteoporosis, and 33-47% have osteopenia (diminished bone loss not meeting diagnostic criteria for osteoporosis).
- The prevalence of osteoporosis is 7% in white men, 5% in black men, and 3% in Hispanic-American men.
- Up to 25% of people older than 50 with fracture are male. The Office of Disease Prevention and Health Promotion notes that about 10 million people aged 50 years or older in the US have osteoporosis.Around 2 million of these people are males.
- Incidence of hip fracture at age of 65 is 4-5/1000 in men vs 8-10/1000 in women. Around the world, 1 in 3 women and 1 in 5 men aged 50 and over will suffer a fragility fracture during their lifetime.
- Important to note that mortality from hip fracture is 31% in men in contrast 17% in women.

How does bone mass change throughout life?

PEAK BONE MASS THROUGHOUT LIFE





Bone is a living tissue that is constantly changing. The rapid increase in bone mass takes place during the active growth during adolescence and continue to increase during the young adult period of life.

Bone changes occur by bone **modeling and bone remodeling.** Bone modeling is a process when bone resorption and bone formation occur on separate surfaces. In this situation, the formation and resorption are not coupled, and it takes place from birth to adulthood when there is a gain in skeletal mass and changes in skeletal form. During this time, long bones increase in length and diameter and peak bone mass is achieved.

Peak bone mass is 10-12% higher in men than in women.

After the growth period, the bone mass and structural integrity is maintained by a remodelling process. Remodeling is the replacement of old tissue by new bone tissue that continues throughout the life. **Almost all bone in adults is remodeled every 10 years.** Remodeling involves the coupling of bone formation and bone resorption.

However, when there is an imbalance between bone breakdown and bone formation, it can result in the bone loss. The bone loss is typically slower in men than in women.

Common risk factors for low bone mass during skeleton growth and bone loss:

- Genetic disorders such as osteogenesis imperfecta, Klinefelter syndrome, Ehlers-Dansol syndrome, glycogen storage disorders, hypophosphatemic rieckets, Down syndrome, etc.
- Delayed puberty, growth hormone deficiency
- Overactive thyroid function (hyperthyroidism)
- Acromegaly, elevated prolactin, hypogonadism
- Overproduction of cortisol (Cushing disease or Cushing syndrome)
- Loss of pituitary functions
- Diabetes mellitus
- Chronic disorders such as cystic fibrosis, chronic kidney disorder, disorders of malabsorption (celiac disease, inflammatory bowel disorders), juvenile idiopathic arthritis, systemic lupus erythematosus, congenital heart disease, etc.
- Medications with negative effect on bone tissue: corticosteroids, antiseizures medications, chemotherapy, some anti-HIV medications.
- Nutrition-related causes: malnutrition, low calcium diet, anorexia nervosa or binge eating, vegetarian diet, total parental nutrition, obesity
- Low physical activity including cerebral palsy, Duchenne muscular dystrophy, prolong immobilization, spinal neuronal tube defects

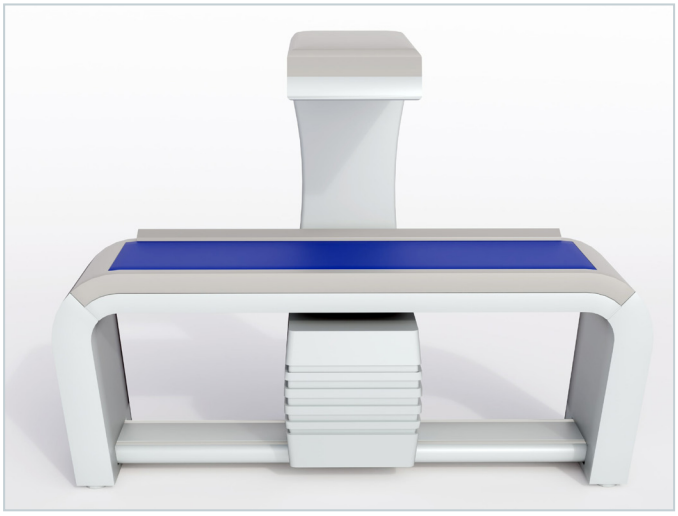
Major modifiable risk factors
Lack of physical activity or fall risk
Weight loss
Cigarette smoking
Alcohol use
Stress

Major non-modifiable risk factors
History of falls
Age
Gender
Race
Prior fracture
Reproductive factors (family history of osteoporosis)

Source: https://www.dovepress.com/a-comprehensive-overview-on-osteoporosis-and-its-risk-factors-peer-reviewed-fulltext-article-TCRM

Current recommendations for screening:

DXA SCANNER



What are **current recommendations for screening for osteoporosis in men** based on current guidelines? There are no one accepted opinion on the screening for low bone mineral density in men in comparison with accepted screening in women.

Based on the **US preventive services task force, 2025,** final recommendation statement, the current evidence is insufficient to assess the balance of benefits and harms of screening for osteoporosis to prevent osteoporotic fractures in men.

Based on the **International Society for Clinical Densitometry (ISCD), 2023** the evaluation for bone mineral density has been recommended for men who meet criteria as below:

Men aged 70 and older

For men < 70 years of age a bone density test is indicated if they have a risk factor for low bone mass such as:

- Low body weight
- Prior fracture
- High risk medication use
- Disease or condition associated with bone loss
- Adults with a fragility fracture
- Adults with a disease or condition associated with low bone mass or bone loss
- Adults taking medications associated with low bone mass or bone loss
- Anyone being considered for pharmacologic therapy
- Anyone being treated, to monitor treatment effectiveness
- Anyone not receiving therapy in whom evidence of bone loss would lead to treatment

Based on **Endocrine Society, 2012** the recommendations are to test the higher risk men including men aged ≥70 and men aged 50–69 who have risk factors (e.g. low body weight, prior fracture as an adult, smoking, etc.).

How you can check your bone mineral density if you are at risk for bone loss:
The central dual-energy x-ray absorptiometry (DXA) is a standard of diagnosis for osteoporosis and measures bone mineral density (BMD).
It is:

- Widely accessible
- Easy to use
- Low radiation exposure

Since there is no current single accepted recommendation for testing bone mineral density in men, the screening DXA study might not be covered by the insurance.

The out of pocket price for the bone mineral density testing for men who would like to have the testing completed regardless insurance coverage is $100 at any TGH Imaging facility.

For more information on osteoporosis, bone mineral density, testing, treatment:

International Osteoporosis Foundation

For more information and access the International Osteoporosis Foundation (IOF) resources, please scan the QR code

www.osteoporosis.foundation

Bone Health & Osteoporosis

For more information and access the Bone Health & Osteoporosis Foundation (IOF) resources, please scan the QR code

www.bonehealthandosteoporosis.org

References:

- National Institute of Arthritis and Musculoskeletal and Skin Diseases. (n.d.). *Osteoporosis in men.* Retrieved from https://www.niams.nih.gov/health-topics/osteoporosis-men
- International Osteoporosis Foundation. (n.d.). *Bone biology.* Retrieved from https://www.osteoporosis.foundation/health-professionals/about-osteoporosis/bone-biology#:~:text=Bone%20modelling,increases%20in%20length%20and%20diameter.
- National Osteoporosis Foundation (NOF). (2014). *Clinician's guide to prevention and treatment of osteoporosis. Osteoporosis International,* 25(10), 2359–2381.
- Bilezikian, J. P. (1999). Osteoporosis in men. *Journal of Clinical Endocrinology & Metabolism,* 84(10), 3431–3434.
- Watts, N. B., Adler, R. A., Bilezikian, J. P., Drake, M. T., Eastell, R., Orwoll, E. S., & Finkelstein, J. S. (2012). Osteoporosis in men: An Endocrine Society Clinical Practice Guideline. *Journal of Clinical Endocrinology & Metabolism.*
- American Academy of Family Physicians. (2003). Osteoporosis. *American Family Physician,* 67(7), 1521–1526.
- Looker, A. C., Orwoll, E. S., Johnston, C. C., Lindsay, R. L., Wahner, H. W., Dunn, W. L., et al. (1997). Prevalence of low femoral bone density in older U.S. adults from NHANES III. *Journal of Bone and Mineral Research,* 12(11), 1761–1768.
- International Society for Clinical Densitometry. (2023). *ISCD Official Positions – Adult.*
- Consensus Development Conference. (1991). Diagnosis, prophylaxis, and treatment of osteoporosis. *American Journal of Medicine,* 90, 107–110.
- Bone health in children with rheumatic disorders: Focus on molecular mechanisms, diagnosis, and management. (2022). *International Journal of Molecular Sciences,* 23(10), 5725.