

TABLE 75-1 CONDITIONS, DISEASES, AND MEDICATIONS THAT CAUSE OR CONTRIBUTE TO OSTEOPOROSIS AND FRACTURES

LIFESTYLE FACTORS	Panhypopituitarism Premature and primary ovarian failure Secondary gonadal failure Turner's syndrome, Klinefelter's syndrome	RHEUMATOLOGIC AND AUTOIMMUNE DISEASES	Post-transplantation bone disease Sarcoidosis Weight loss
Alcohol abuse Excessive thinness Excess vitamin A Falling High salt intake Immobilization Inadequate physical activity Low calcium intake Smoking (active or passive) Vitamin D insufficiency	ENDOCRINE DISORDERS	Ankylosing spondylitis Lupus Rheumatoid arthritis Other rheumatic and autoimmune diseases	MEDICATIONS
GENETIC FACTORS	Adrenal insufficiency Cushing's syndrome Diabetes mellitus (types 1 and 2) Hyperparathyroidism Thyrotoxicosis	CENTRAL NERVOUS SYSTEM DISORDERS	Aluminum (in antacids) Anticoagulants (heparin) Anticonvulsants Aromatase inhibitors Barbiturates Cancer chemotherapeutic drugs Cyclosporine and tacrolimus Depo-medroxyprogesterone (premenopausal contraception) Glucocorticoids (≥ 5 mg/day of prednisone or equivalent for ≥ 3 mo) Gonadotropin-releasing hormone (GnRH) antagonists and agonists Lithium Methotrexate Parenteral nutrition Proton pump inhibitors Selective serotonin reuptake inhibitors Tamoxifen (premenopausal use) Thiazolidinediones (e.g., Actos, Avandia) Thyroid hormones (in excess)
Cystic fibrosis Ehlers-Danlos syndrome Gaucher's disease Glycogen storage diseases Hemochromatosis Homocystinuria Hypophosphatasia Idiopathic hypercalciuria Marfan syndrome Osteogenesis imperfecta Parental history of hip fracture or osteoporosis Porphyria	GASTROINTESTINAL DISORDERS	Epilepsy Multiple sclerosis Parkinson's disease Spinal cord injury Stroke	
HYPOGONADAL STATES	Celiac disease Gastric bypass Gastrointestinal surgery Inflammatory bowel disease Malabsorption Pancreatic disease Primary biliary cirrhosis	MISCELLANEOUS CONDITIONS AND DISEASES	
Anorexia nervosa and bulimia Athletic amenorrhea Hyperprolactinemia Male hypogonadism	HEMATOLOGIC DISORDERS	Human immunodeficiency virus (HIV) infection/acquired immunodeficiency syndrome (AIDS) Alcoholism Amyloidosis Chronic metabolic acidosis Chronic obstructive lung disease Congestive heart failure Depression End-stage renal disease Hypercalciuria Idiopathic scoliosis Muscular dystrophy	

Modified from National Osteoporosis Foundation: 2013 clinician's guide to Prevention and treatment of osteoporosis. Available at <http://nof.org/files/nof/public/content/file/917/upload/481.pdf>. Accessed August 23, 2014.

**FIGURE 75-3** Lateral spine radiograph demonstrates a thoracic anterior wedge compression fracture.

that of DEXA, and radiation doses are significantly higher than those of DEXA. Single-photon absorptiometry of the forearm and peripheral measures, such as heel ultrasound, have also been used to assess bone mass. However, the WHO classification should be used only with the central DEXA measurements.

TABLE 75-2 WORLD HEALTH ORGANIZATION CLASSIFICATION FOR OSTEOPOROSIS

CLASSIFICATION	CRITERIA FOR BONE MINERAL DENSITY
Normal	Above -1.0 SD of young adult peak mean value
Low bone mass (osteopenia)	Between -1.0 and -2.5 SD of young adult peak mean value
Osteoporosis	Below -2.5 SD of young adult peak mean value

SD, Standard deviation.

The National Osteoporosis Foundation (NOF) recommends obtaining a bone mineral density assessment in all women 65 years old or older and postmenopausal women younger than 65 years with a risk factor (Table 75-3). The U.S. Preventive Services Task Force (USPSTF) recommends bone density tests in all women age 65 or older and women between 60 and 64 years of age with a risk factor. The NOF recommends obtaining a bone mineral density value for men 70 years old or older; the USPSTF has not recommended screening in men. Databases are available for white, African American, Asian, and Hispanic men and women. These guidelines from the NOF and USPSTF for screening patients for osteoporosis are relatively similar for postmenopausal women but differ for older men. At the time of their review, the USPSTF did not feel there was ample evidence to determine screening guidelines for men.

The WHO developed a fracture risk assessment tool (FRAX) to predict the 10-year risk for hip or any major osteoporotic fracture for women and men between 40 and 90 years of age. The FRAX for the individual patient incorporates femoral neck