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

## LIFESTYLE FACTORS

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

### **GENETIC FACTORS**

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

#### **HYPOGONADAL STATES**

Anorexia nervosa and bulimia Athletic amenorrhea Hyperprolactinemia Male hypogonadism Panhypopituitarism Premature and primary ovarian failure Secondary gonadal failure Turner's syndrome, Klinefelter's

## **ENDOCRINE DISORDERS**

syndrome

Adrenal insufficiency Cushing's syndrome Diabetes mellitus (types 1 and 2) Hyperparathyroidism Thyrotoxicosis

### **GASTROINTESTINAL DISORDERS**

Celiac disease Gastric bypass Gastrointestinal surgery Inflammatory bowel disease Malabsorption Pancreatic disease Primary biliary cirrhosis

## **HEMATOLOGIC DISORDERS**

Hemophilia Leukemia and lymphomas Monoclonal gammopathies Multiple myeloma Sickle cell disease Systemic mastocytosis Thalassemia

## RHEUMATOLOGIC AND AUTOIMMUNE DISEASES

Ankylosing spondylitis Lupus Rheumatoid arthritis Other rheumatic and autoimmune diseases

## CENTRAL NERVOUS SYSTEM DISORDERS

Epilepsy Multiple sclerosis Parkinson's disease Spinal cord injury Stroke

## MISCELLANEOUS CONDITIONS AND DISEASES 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

Post-transplantation bone disease Sarcoidosis Weight loss

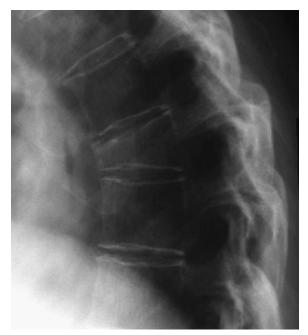
## **MEDICATIONS**

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 ≥3mo) 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)

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 Between -1.0 and -2.5 SD of young adult peak (osteopenia) 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