

ACTIVE LEARNING TEMPLATE: *Medication*

STUDENT NAME BICH BLU

MEDICATION alendronate (Fosamax)

REVIEW MODULE CHAPTER 34

CATEGORY CLASS Bisphosphonates

PURPOSE OF MEDICATION

Expected Pharmacological Action

- Oral bisphosphonate
- First nonestrogen nonhormonal option for preventing bone loss
- Inhibits or reverses osteoclast-mediated bone resorption

Therapeutic Use

Prevention and treatment of osteoporosis in men and in postmenopausal women as well as treatment of glucocorticoid-induced osteoporosis in men and for the treatment of Paget disease in women.

Complications

CNS: headache. **EENT:** blurred vision, conjunctivitis, eye pain/inflammation. **CV:** atrial fibrillation. **GI:** abdominal distention, abdominal pain, acid regurgitation, constipation, diarrhea, dyspepsia, dysphagia, esophageal cancer, esophageal ulcer, esophagitis, flatulence, gastritis, nausea, taste perversion, vomiting. **Derm:** erythema, photosensitivity, rash. **MS:** musculoskeletal pain, femur fractures, osteonecrosis (primary at jaw). **Resp:** asthma exacerbation.

Medication Administration

PO (Adults): Treatment of osteoporosis - 10 mg once daily or 70 mg once weekly. Paget's disease - 40 mg once daily for 6 months. Retreatment may be considered for patients who relapse. Treatment of corticosteroid-induced osteoporosis in men and premenopausal women - 5 mg once daily. Treatment of corticosteroid-induced osteoporosis in postmenopausal women not receiving estrogen - 10 mg once daily.

Contraindications/Precautions

Contraindication in: Abnormalities of the esophagus which delay esophageal emptying (i.e. strictures, achalasia); Inability to stand/sit upright for at least 30 min. **Renal insufficiency** ($CCr < 35 \text{ mL/min}$); **OB, Lactation:** Safety not established.

Use Cautionally in: History of upper GI disorders; Pre-existing hypocalcemia or vitamin D deficiency; Invasive dental procedure, cancer, receiving chemotherapy, corticosteroids, or angiogenesis inhibitors, poor oral hygiene, periodontal disease, dental disease, anemia, coagulopathy, infection, or poorly-fitting denture (may ↑ risk of jaw osteonecrosis).

Interactions

Drug-Drug: Calcium supplement, antacids, and levothyroxine may ↓ the absorption of alendronate. Doses $> 10 \text{ mg/day}$ ↑ risk of adverse GI events when used with NSAIDs. IV ranitidine ↑ blood level.

Drug-Food: Food significantly ↓ absorption. Caffeine (coffee, tea, cola), mineral water, and orange juice also ↓ absorption.

Nursing Interventions

- Assess baseline vital signs, weigh, blood glucose levels, and renal and liver function study results.
- Assess whether the patient smokes.
- Assess history and medication history.
- Assess contraindications, including potential pregnancy.
- Ensure that patients have no esophageal abnormalities.

Evaluation of Medication Effectiveness

- Increased bone density and prevention or management of osteoporosis.
- Decreased fractures
- Decreased progression of Paget's disease.
- Treatment of corticosteroid-induced osteoporosis

Client Education

- Take with an 8-ounce glass of water immediately upon arising in the morning.
- Do not lie down for at least 30 minutes after taking it.
- If a dose is missed, skip dose and resume the next morning; do not double dose or take later in the day. If a weekly dose is missed, take the morning after remember and resume the following wk on the chosen day. Do not take 2 tablets on the same day. Do not discontinue without consulting health care professional.

System Disorder

STUDENT NAME BICH BUIDISORDER/DISEASE PROCESS OsteoporosisREVIEW MODULE CHAPTER 34

Alterations in Health (Diagnosis)

Osteoporosis

Pathophysiology Related to Client Problem

During the continuous bone remodeling process, bone resorption exceeds bone formation, leading to thin, fragile bones that are subject to spontaneous fracture, particularly in the vertebrae. Although bone density and mass are reduced, the remaining bones are normal. Osteoporosis affects the bones consisting of higher proportions of cancellous bone, such as the vertebrae and femoral neck. The early stages of the condition are asymptomatic but can be diagnosed using various bone density scan and X-rays to demonstrate the bone changes.

Health Promotion and Disease Prevention

Calcium and vitamin D supplement, protein, Regular weight-bearing exercise such as walking or weight lifting

ASSESSMENT

Risk Factors

Aging, ↓ mobility or sedentary life style, hormonal factors such as hyperparathyroidism, Cushing syndrome, or continued intake of catabolic glucocorticoids such as a fracture (disuse osteoporosis), deficits of calcium, vitamin D, or protein related to diet or history of deficits in childhood or malabsorption disorders, cigarette smoking, small light bone structure, as Asian and Caucasian persons.

Laboratory Tests

- Blood calcium levels
- Vitamin D
- Parathyroid hormone (PTH)
- Follicle-stimulating hormone (FSH)
- Protein electrophoresis
- Alkaline phosphatase (ALP)

Expected Findings

Compression fracture of the vertebrae have several obvious effects. Backpain is a common sign, associated with the altered vertebrae causing pressure on the nerves. Kyphosis and scoliosis, abnormal curvatures of the spine with accompanying loss of height, are characteristic of the signal changes seen with osteoporosis. Spontaneous fractures involving the head of the femur or pelvis are frequent occurrences. Healing of the fractures is low.

Diagnostic Procedures

- DEXA scan of the hip, spine, and first four vertebrae; serial heights;
- US of bone; and CT scan

SAFETY CONSIDERATIONS

- Wear well-fitting shoes (no slip-ons), clear all clutter (e.g., throw rugs) from walking areas.
- Assistive devices (e.g., walkers)

PATIENT-CENTERED CARE

Nursing Care

- Assess patient's functional ability for mobility and note changes
- Assist patient with walking if at all possible
- Provide range of motion exercise every shift. Encourage active range of motion exercise
- Assist with self-care activities
- Patient teaching

Therapeutic Procedures

- Surgery to reduce kyphosis and realign the vertebral column
- Injected human parathyroid hormone to decrease bone resorption (helpful for some individuals)
- Fluoride supplements to promote bone deposition

Medications

- Biphosphonates:
 - alendronate (Fosamax)
 - ibandronate (Boniva)
 - risedronate (Actonel)
 - zoledronic acid (Reclast)
- Selective estrogen receptor modifiers (SERMs):
 - raloxifene (Evista)
 - tamoxifen (Nolvadex)
- Hormones
 - Calcitonin (Calcimar)
 - teriparatide (Forteo): stimulates bone formation
 - denosumab (Prolia): prevents bone resorption

Client Education

- Take medication as instructed
- Avoid activities required alertness such as driving, etc.
- Change position slowly to avoid orthostatic hypotension
- Encourage ↑ fluid intake to 2000-3000 mL/day
- Instruct family regarding ROM exercise methods of transferring patients / roomed to wheelchair, and turning at routine intervals

Interprofessional Care

Providing a team-based OPC on site in a CCRC improved quality measures for screening and treatment of osteoporosis and low bone mass.

Complications

- Falls resulting in hip fracture
- Pathologic fractures
- Biphosphonates are associated with the adverse effects of headache, GI upset, and joint pain.