cholecalciferol (kol-e-kal-sif-e-role)
vitamin D3 (inactive)

Classification
Therapeutic: vitamins
Pharmacologic: fat-soluble vitamins

Pregnancy Category C

Indications
Treatment or prevention of vitamin D deficiency.

Action
Requires activation in the liver and kidneys to create the active form of vitamin D3 (calcitriol). Promotes the intestinal absorption of dietary calcium.

Therapeutic Effects:
Treatment and prevention of deficiency states, particularly bone manifestations.

Pharmacokinetics
Absorption: Unknown.
Distribution: Extensively protein bound.
Metabolism and Excretion: Undergoes activation in liver and kidneys to form calcitriol (active form of vitamin D3).
Half-life: 14 hr.

TIME/ACTION PROFILE (effects on serum calcium)
ROUTE ONSET PEAK DURATION
PO unknown unknown unknown

Contraindications/Precautions
Contraindicated in: Hypersensitivity; Hypercalcemia; Vitamin D toxicity; Concomitant use of magnesium-containing antacids or other vitamin D supplements; Malabsorption problems.
Use Cautiously in: OB: Safety not established.

Adverse Reactions/Side Effects
Seen primarily as manifestations of toxicity (hypercalcemia)
CNS: headache, irritability, somnolence, weakness.
EENT: conjunctivitis, photophobia.
CV: arrhythmias, hypertension.
GI: anorexia, constipation, dry mouth, liver enzymes, metallic taste, nausea, pruritus, ptyalism, vomiting, weight loss.
GU: albuminuria, anuria, polyuria.
Derm: pruritus.
F and E: hypercalcemia.
MS: bone pain, muscle pain.

Interactions
Drug-Drug: Cholestyramine, colestipol, or mineral oil ↓ absorption of vitamin D analogues. Use with thiazide diuretics may result in hypercalcemia. Corticosteroids ↓ effectiveness of vitamin D analogues. Concurrent use of magnesium-containing drugs may ↓ risk of hypercalcemia. Calcium-containing drugs may ↑ risk of hypercalcemia.
Drug-Food: Ingestion of foods high in calcium content may lead to hypercalcemia.

Route/Dosage
PO (Adults): 400–1000 IU daily.
PO (Infants): Exclusively or partially breast fed—400 IU daily.

NURSING IMPLICATIONS

Assessment
• Assess for symptoms of vitamin D deficiency prior to and periodically during therapy.
• Assess patient for bone pain and weakness prior to and during therapy.
• Observe patient carefully for evidence of hypercalcemia (paresthesia, muscle twitching, laryngospasm, colic, cardiac arrhythmias, and Chvostek’s or Trousseau’s sign). Protect symptomatic patient by raising and padding side rails, keep head in low position.
• Lab Test Considerations: Monitor serum calcium, phosphorus, and alkaline phosphatase periodically.

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calciferol, a low-calcium diet, or administration of a laxative. IV hydration and loop diuretics may be ordered to increase urinary excretion of calcium. Hemodialysis may also be used.

Potential Nursing Diagnoses

Imbalanced nutrition: less than body requirements (Indications)

Implementation

- PO: May be administered without regard to meals.

Patient/Family Teaching

- Advise patient to take medications as directed. Take missed doses as soon as remembered that day; unless almost time for next dose, do not double up on doses.
- Advise parents to use calibrated measuring device or dropper with oral solution.
- Review diet modifications with patient.
- Encourage patient to comply with dietary recommendations of health care professional. Explain that the best source of vitamins is a well-balanced diet with foods from the 4 basic food groups and the importance of sunlight exposure.
- Patients self-medicating with vitamin supplements should be cautioned not to exceed RDA. The effectiveness of megadoses for treatment of various medical conditions is unproved and may cause side effects.
- Advise patient to avoid concurrent use of antacids containing magnesium.
- Review symptoms of overdose and instruct patient to report these promptly to health care professional.
- Emphasize the importance of follow-up exams to evaluate progress.

Evaluation/Desired Outcomes

- Resolution or prevention of vitamin D deficiency.

Why was this drug prescribed for your patient?