Diltiazem (dil-tye-a-zem)
Cardiovascular: CA: Cardiovascular, cardiovascular system, coronary vasodilation, hypotension, bradycardia, arrhythmias, angina, angina pectoris, AV block (unless an artificial pacemaker is in place); Systolic BP reduction during general anesthesia.
Abdominal: GI: nausea, vomiting, diarrhea, abdominal cramping, anorexia, constipation.
Respiratory: Resp: dyspnea, cough, pharyngitis, bronchitis.
Skin: Derm: rash, pruritus, urticaria, phototoxicity, photosensitivity, Stevens-Johnson syndrome.
Other: other: Cramps, myalgia, arthralgia, peripheral edema, gynecomastia, weight gain.

Use Cautiously in: Severe hepatic impairment; Renal impairment; Severe hypertension; Hypothyroidism; Concurrent use with nitrates; Hypersensitivity; Increased risk of digitalis toxicity.

Contraindications/Precautions
Contraindicated in: Hypersensitivity to diltiazem or other calcium channel blockers; Lactation: When used during lactation, diltiazem may be excreted in the breast milk. Lactation should be discontinued.

Pharmacokinetics
Absorption: Well absorbed, but rapidly metabolized after oral administration. Absorption unchanged by food. Oral formulation: peak serum concentration occurs 0.5–2 hr. Intravenous formulation: peak serum concentration occurs 0.5–2 hr.
Distribution: Unbound fraction 70–80%. Volume of distribution 2–3 L/kg. Protein binding 70–80%.
Metabolism and Excretion: Mostly metabolized by the liver (CYP3A4 enzyme system). Half-life: 3.5–9 hr.
Elimination: Excreted in urine.

Drug Interactions
Therapeutic Drug-Drug: May interfere with metabolism of and increase levels of and risk of toxicity from warfarin, cyclosporine, and simvastatin. May result in bradycardia, conduction defects, or CHF. Phenothiazines and phenothiazines may interfere with metabolism of and increase levels of and risk of toxicity from lithium, quinidine, digoxin, or carbonic anhydrase inhibitors. Cimetidine and ranitidine may increase levels and effect. May ↓ or ↓ the effects of lithium or theophylline.
Drug-Food: Grapefruit juice may increase levels and effect. Increase the risk of toxicity from cyclosporine.

Route/Dosage
PO (Adults): 60–240 mg 3–4 times daily or 180–240 mg once daily as CR or XR capsules or LA capsules or 1 tablet (up to 560 mg daily); Concurrent use with nitrates—Diltiazem dose should not exceed 120 mg daily and intravenous dose should not exceed 15 mg every 3 hours.
IV (Adults): 0.5–2.5 mg/kg, may repeat every 15 min with a dose of 0.5–1.5 mg/kg. May decrease with continuous infusion at 10 mg/hr (5–15 mg/hr) for up to 24 hr.

Adverse Reactions/Side Effects

Interactions
Drug-Drug: May ↓ levels of and risk of toxicity from warfarin, cyclosporine, and simvastatin. May result in bradycardia, conduction defects, or CHF. Phenothiazines and phenothiazines may interfere with metabolism of and increase levels of and risk of toxicity from lithium, quinidine, digoxin, or carbonic anhydrase inhibitors. Cimetidine and ranitidine may increase levels and effect. May ↓ or ↓ the effects of lithium or theophylline.

Pharmacologic/Therapeutic: Class IV antiarrhythmics, antianginals, antihypertensives. Classification: calcium channel blockers, calcium antagonists.

Other Names: Cardizem, Cardizem CD, Cardizem LA, Cartia XT, Dilacor XR, Taztia XT, Tiazac (diltiazem)

Therapeutic Effects: Systemic vasodilation resulting in decreased BP. Coronary vasodilation resulting in decreased frequency and severity of attacks of angina. Reduction of ventricular rate in atrial fibrillation or flutter.

Actions:
Inhibits transport of calcium into myocardial and vascular smooth muscle cells, resulting in inhibition of excitation-contraction coupling and subsequent contraction. Systemic vasodilation resulting in decreased frequency and severity of attacks of angina. Reduction of ventricular rate in atrial fibrillation or flutter.

Indications:
Hypertension. Angina pectoris and vasospastic (Prinzmetal's) angina. Supraventricular tachyarrhythmias and rapid ventricular rates in atrial flutter or fibrillation.

Contraindications/Precautions:
†Maximum antihypertensive effect with chronic therapy. Concurrent use of rifampin. Concurrent simvastatin therapy—Diltiazem dose should not exceed 240 mg/day or 180–240 mg once daily as CD or XR capsules or LA tablets (up to 360 mg/day); Concurrent use with nitrates—Diltiazem dose should not exceed 120 mg daily and intravenous dose should not exceed 15 mg every 3 hours.
NURSING IMPLICATIONS

Assessment
- Monitor BP and pulse prior to therapy, during dose titration, and periodically during therapy. Monitor ECG periodically during prolonged therapy. May cause prolongation of PR interval.
- Monitor intake and output ratios and daily weight. Assess for signs of HF (peripheral edema, rales/crackles, dyspnea, weight gain, jugular venous distention).
- Assess for rash periodically during therapy. May cause Stevens-Johnson syndrome. Discontinue therapy if severe or if accompanied with fever, general malaise, fatigue, muscle or joint aches, blistering, oral lesions, conjunctivitis, hepatitis and/or eosinophilia.
- Angina: Assess location, duration, intensity, and precipitating factors of patient’s anginal pain.
- Arrhythmias: Monitor ECG continuously during administration. Report bradycardia or prolonged hypotension promptly. Emergency equipment and medication should be available. Monitor BP and pulse before and frequently during administration.
- Lab Test Considerations: Total serum calcium concentrations are not affected by calcium channel blockers.
- Monitor renal and hepatic functions periodically during long-term therapy. May cause increase in hepatic enzymes after several days of therapy, which return to normal on discontinuation of therapy.

Potential Nursing Diagnoses
Acute pain (Indications)
Decreased cardiac output (Adverse Reactions)

Implementation
- Do not confuse Tiazac (diltiazem) with Ziac (bisoprolol/hydrochlorothiazide).
- PO: May be administered without regard to meals. May be administered with meals if GI irritation becomes a problem.
- Do not open, crush, break, or chew sustained-release capsules or tablets. Empty tablets that appear in stool are not significant. Crush and mix diltiazem with food or fluids for patients having difficulty swallowing.

IV Administration
- Direct IV: Administer bolus dose undiluted. Concentration: 5 mg/mL. Rate: Administer over 2 min.
- Continuous Infusion: Diluent: Dilute 125 mg in 100 mL, 250 mg in 250 mL, or 250 mg in 500 mL of 0.9% NaCl, D5W or 0.45% NaCl. Infuse in stable for 24 hr at room temperature or if refrigerated. Concentration: 25 mg/125 mL (0.2 mg/mL), 50 mg/250 mL (0.2 mg/mL), 250 mg/500 mL (0.5 mg/mL).
- Rate: See Route/Dosage section. Titrate to patient’s heart rate and BP response. Y-Site Compatibility: albumin, allopurinol, alteplase, amikacin, amnoglycoside acid, amoxicillin, amphotericin B colloidal, anidulafungin, aripiprazole, aminoguanidine, amiodarone, amphotericin B, amphotericin B colloidal, amrinone, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthetics, anesthesi
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diltiazem

- phenylephrine, potassium acetate, potassium chloride, potassium phosphates, prochlorperazine, promethazine, propafenone, quinupristin/dalfopristin, ranitidine, remifentanil, revlimid, sodium acetate, streptokinase, streptodornase, sucralfate, tacrolimus, talc, terbinafine, ticarcillin, tobramycin, tizanidine, tovalon, trilostane, umifenidine, verapamil, vinblastine, vinorelbine, vinorelbine, vincristine, vinorelbine, zidovudine, zoledronic acid.

- Y-Site Incompatibility: allopurinol, amphotericin B lipid complex, amphoterin B liposome, cefepime, chloramphenicol, dantrolene, diazepam, doxorubicin liposomal, fluorouracil, furosemide, ganciclovir, ketorolac, methotrexate, micafungin, pantoprazole, pentobarbital, phenobarbital, phenytoin, piperacillin/tazobactam, rifampin, thiopental.

- Patient/Family Teaching
  - Advise patient to take medication as directed at the same time each day, even if feeling well. Take missed doses as soon as possible unless almost time for next dose; do not double doses. May need to be discontinued gradually.
  - Advise patient to avoid large amounts (6–8 glasses of grapefruit juice/day) during therapy.
  - Instruct patient to change positions slowly to minimize orthostatic hypotension.
  - May cause drowsiness or dizziness. Advise patient to avoid driving or other activities requiring alertness and to take medication as directed.
  - Patient on concurrent nitrate or beta-blocker therapy to continue taking both medications as directed and to use SL nitroglycerin as needed for anginal attacks.
  - Advise patient to contact health care professional if chest pain does not improve, worsens after therapy, or occurs with diaphoresis, if shortness of breath occurs, or if severe, persistent headaches occurs.
  - Caution patient to discuss exercise restrictions with health care professional before exercise.

- Hypersensitivity: Encourage patient to consult with other interventions for hypotension (weight reduction, low-sodium diet, smoking cessation, medications of alcohol consumption, regular exercise, and stress management). Medication controls but does not cure hypertension.

- Instruct patient and family in proper technique for monitoring BP. Advise patient to take BP weekly and to report significant changes to health care professional.

- Evaluation/Desired Outcomes
  - Decrease in BP.
  - Decrease in frequency and severity of anginal attacks.
  - Decrease in need for nitrate therapy.
  - Increase in activity tolerance and sense of well-being.
  - Suppression and prevention of tachyarrhythmias.

Why was this drug prescribed for your patient?