

- Assess for arrhythmias, especially after giving loading dose.
- Check vital signs and fluid intake and output.
- Monitor patient's response to drug, and assess pulmonary function test results.

Patient teaching

- Advise patient to take oral doses at meals with 8 oz of water.
- Caution patient to avoid driving and other hazardous activities until he knows how drug affects concentration and alertness.
- Tell patient to minimize GI upset by eating small, frequent servings of food and drinking plenty of fluids.
- Advise patient to establish effective bedtime routine to minimize insomnia.
- Caution patient not to change aminophylline brands.
- If patient smokes, tell him to notify prescriber if he stops smoking; dosage may need to be adjusted.
- As appropriate, review all other significant and life-threatening adverse reactions and interactions, especially those related to the drugs, tests, herbs, and behaviors mentioned above.

amiodarone hydrochloride

Amyben[®], Cordarone,
Cordarone X[®], Pacerone

Pharmacologic class: Adrenergic blocker

Therapeutic class: Antiarrhythmic (class III)

Pregnancy risk category D

FDA BOXED WARNING

- Because of substantial toxicity, drug is indicated only in patients with life-threatening arrhythmias.

- Drug may cause potentially fatal pulmonary toxicities, including hypersensitivity pneumonitis and interstitial/alveolar pneumonitis. Pulmonary toxicity is fatal about 10% of time.
- Hepatic injury is common but usually mild, manifesting only as abnormal liver enzyme levels. However, overt hepatic disease can occur and, in rare cases, is fatal.
- Drug may exacerbate arrhythmias by reducing tolerance for them or making them harder to reverse. Arrhythmias and significant heart block or sinus bradycardia occur in 2% to 5% of patients.
- Even in patients at high risk for arrhythmic death in whom toxicity is an acceptable risk, drug poses major management problems. Therefore, other agents should be tried first whenever possible.
- Difficulty of using drug effectively and safely poses significant risk. Patients with indicated arrhythmias must be hospitalized to receive loading dose; response generally takes at least 1 week, but usually 2 or more.

Action

Prolongs duration and refractory period of action potential. Slows electrical conduction, electrical impulse generation from sinoatrial node, and conduction through accessory pathways. Also dilates blood vessels.

Availability

Injection: 50 mg/ml in 3-ml ampules

Tablets: 200 mg, 400 mg

Indications and dosages

➤ Life-threatening ventricular arrhythmias

Adults: 150 mg in 100 ml of dextrose 5% in water (D₅W) by rapid I.V. infusion over 10 minutes; then dilute 900 mg in 500 ml of D₅W and administer 360 mg by slow I.V. infusion over next

6 hours; then 540-mg I.V. maintenance infusion over next 18 hours. Or 800 to 1,600 mg P.O. daily in one to two doses for 1 to 3 weeks; then 600 to 800 mg P.O. daily in one to two doses for 1 month; then 400-mg P.O. daily as maintenance dosage.

Off-label uses

- Atrioventricular (AV) nodal reentry tachycardia (with parenteral use)
- Conversion of atrial fibrillation to normal sinus rhythm

Contraindications


- Hypersensitivity to drug
- Cardiogenic shock
- Second- or third-degree AV block
- Marked sinus bradycardia
- Breastfeeding
- Neonates


Precautions

Use cautiously in:

- electrolyte imbalances, severe pulmonary or hepatic disease, thyroid disorders
- history of heart failure
- elderly patients
- pregnant patients
- children.

Administration

 Know that I.V. amiodarone is a high-alert drug.

 Give loading dose only in hospital setting with continuous ECG monitoring.

- Administer oral loading dose in two equal doses with meals. Give maintenance dose daily or in two divided doses to minimize GI upset.
- Don't give I.V. unless patient is on continuous ECG monitoring.
- Dilute I.V. drug with dextrose 5% in water and use in-line filter. Drug isn't compatible with normal saline solution.
- Use central venous catheter when giving repeated doses. If possible, use dedicated catheter for drug.

Route	Onset	Peak	Duration
P.O.	Variable	3-7 hr	Wks-mos
I.V.	Hrs	Unknown	Variable

Adverse reactions

CNS: dizziness, fatigue, headache, insomnia, paresthesia, peripheral neuropathy, poor coordination, involuntary movements, tremor, sleep disturbances

CV: hypotension, **heart failure, worsening arrhythmia, AV block, sinoatrial node dysfunction, bradycardia, asystole, cardiac arrest, cardiogenic shock, electromechanical dissociation, ventricular tachycardia**

EENT: corneal microdeposits, corneal or macular degeneration, visual disturbances, dry eyes, eye discomfort, optic neuritis or neuropathy, scotoma, lens opacities, photophobia, visual halos, **papilledema**

GI: nausea, vomiting, constipation, abdominal pain, abnormal salivation, anorexia

GU: decreased libido

Hematologic: **coagulation abnormalities, thrombocytopenia**

Hepatic: nonspecific hepatic disorders, **hepatic dysfunction**

Metabolic: hypothyroidism, hyperthyroidism

Respiratory: cough, **adult respiratory distress syndrome, pulmonary inflammation or fibrosis, pulmonary edema**

Skin: flushing, photosensitivity, toxic epidermal necrolysis

Other: abnormal taste and smell, edema, fever, **Stevens-Johnson syndrome**

Interactions

Drug-drug. *Anticoagulants:* increased prothrombin time (PT)

Beta-adrenergic blockers: increased risk of bradycardia and hypotension

Calcium channel blockers: increased risk of AV block (with verapamil, diltiazem) or hypotension (with any calcium channel blocker)

Cholestyramine: decreased amiodarone blood level

Cimetidine, ritonavir: increased amiodarone blood level

Class I antiarrhythmics (disopyramide, flecainide, lidocaine, mexiletine, procainamide, quinidine): increased blood levels of these drugs, leading to toxicity

Cyclosporine: elevated cyclosporine and creatinine blood levels

Dextromethorphan: impaired dextromethorphan metabolism (with amiodarone therapy of 2 weeks or longer)

Digoxin: increased digoxin blood level, leading to toxicity

Fentanyl: increased bradycardia, hypotension

Fluoroquinolones: increased risk of life-threatening arrhythmias

Methotrexate: impaired methotrexate metabolism, possibly causing toxicity (with amiodarone use longer than 2 weeks)

Phenytoin: decreased amiodarone blood level or increased phenytoin blood level (with amiodarone use longer than 2 weeks)

Theophylline: increased theophylline blood level (with amiodarone use longer than 1 week)

Drug-diagnostic tests. *Kidney function tests:* abnormal results

Drug-food. *Grapefruit juice:* increased drug concentration

Drug-herb. *St. John's wort:* decreased drug blood level

Patient monitoring

🔊 Monitor patient closely. Drug may cause serious or life-threatening adverse reactions.

🔊 Watch for slow onset of life-threatening arrhythmias, especially after giving loading dose.

🔊 Monitor ECG continuously during loading dose and when dosage is changed.

- Check patient's blood pressure, pulse, and heart rhythm regularly.

- Assess for signs and symptoms of lung inflammation.

- Monitor baseline and subsequent chest X-rays, as well as pulmonary, liver, and thyroid function test results.

- Closely monitor patient who's receiving other drugs concurrently because amiodarone can interact with many drugs. Check digoxin blood level if patient is receiving digoxin; monitor PT or International Normalized Ratio if patient is receiving anticoagulants.

Patient teaching

🔊 Inform patient that drug may cause serious adverse reactions. Instruct him to report these immediately.

- Tell patient to take oral doses with meals. Advise him to divide daily dose into two doses if drug causes GI upset.

- Tell patient that adverse reactions are most common with high doses and may become more frequent after 6 months of therapy.

- Inform patient that he'll undergo regular blood testing, chest X-rays, and pulmonary function tests during therapy.

- As appropriate, review all other significant and life-threatening adverse reactions and interactions, especially those related to the drugs and tests mentioned above.

amitriptyline hydrochloride

Apo-Amitriptyline, Levate[®],
Novotriptyn[®]

Pharmacologic class: Tricyclic compound

Therapeutic class: Antidepressant

Pregnancy risk category D

FDA BOXED WARNING

- Drug may increase risk of suicidal thinking and behavior in children and

adolescents with major depressive disorder and other psychiatric disorders. Risk is greater during first few months of treatment, and must be balanced with clinical need, as depression itself increases suicide risk. With patient of any age, observe closely for clinical worsening, suicidality, and unusual behavior changes when therapy begins. Advise family to observe patient closely and communicate with prescriber as needed.

- Drug isn't approved for use in pediatric patients.

Action

Unclear. Inhibits norepinephrine and serotonin reuptake at presynaptic neuron, increasing levels of these neurotransmitters in brain. Also has sedative, anticholinergic, and mild peripheral vasodilating effects.

Availability

Injection: 10 mg/ml

Syrup: 10 mg/5 ml

Tablets: 10 mg, 25 mg, 50 mg, 75 mg, 100 mg, 150 mg

Indications and dosages

➤ Depression

Adults: 75 mg P.O. daily in divided doses; may increase gradually to 150 mg/day. Or start with 50 to 100 mg P.O. at bedtime and increase by 25 to 50 mg as needed, to a total dosage of 150 mg. Hospitalized patients initially may receive 100 mg P.O. daily, with gradual increases as needed to a total dosage of 300 mg P.O. With I.M. use, give 20 to 30 mg q.i.d.

Dosage adjustment

- Elderly patients
- Adolescents
- Outpatients

Off-label uses

- Analgesic adjunct for phantom limb pain or chronic pain

Contraindications

- Hypersensitivity to drug or other tricyclic antidepressants (TCAs)
- MAO inhibitor use within past 14 days
- Children younger than age 12

Precautions

Use cautiously in:

- seizures, cardiovascular disease, renal or hepatic impairment, urinary retention, hyperthyroidism, increased intraocular pressure, closed-angle glaucoma, prostatic hypertrophy, bipolar disorder, schizophrenia, paranoia
- elderly patients
- pregnant or breastfeeding patients.

Administration

- Administer full dose at bedtime to minimize orthostatic hypotension.
- Give injectable form by I.M. route only.
- Don't withdraw drug suddenly. Instead, taper dosage gradually.
- If patient is scheduled for surgery, discuss dosage tapering with prescriber.
- Be aware that drug is often used in conjunction with psychotherapy.

Route	Onset	Peak	Duration
P.O.	2-4 wk	2-6 wk	Unknown
I.M.	2-3 wk	2-6 wk	Unknown

Adverse reactions

CNS: headache, fatigue, agitation, numbness, paresthesia, peripheral neuropathy, weakness, restlessness, panic, anxiety, dizziness, drowsiness, difficulty speaking, excitement, hypomania, psychosis exacerbation, extrapyramidal effects, poor coordination, hallucinations, insomnia, nightmares, **seizures, coma, suicidal behavior or ideation (especially in children and adolescents)**

CV: ECG changes, tachycardia, hypertension, orthostatic hypotension, **arrhythmias, heart block, myocardial infarction**

EENT: blurred vision, dry eyes, mydriasis, abnormal visual accommodation, increased intraocular pressure, tinnitus
GI: nausea, vomiting, constipation, dry mouth, epigastric pain, anorexia, **paralytic ileus**

GU: urinary retention, delayed voiding, urinary tract dilation, gynecomastia

Hematologic: agranulocytosis, thrombocytopenia, thrombocytopenic purpura, leukopenia

Metabolic: changes in blood glucose level

Skin: photosensitivity rash, urticaria, flushing, diaphoresis

Other: increased appetite, weight gain, high fever, edema, hypersensitivity reaction

Interactions

Drug-drug. *Activated charcoal:* decreased amitriptyline absorption

Adrenergics, anticholinergics, anticholinergic-like drugs: increased anticholinergic effects

Amiodarone, cimetidine, quinidine, ritonavir: increased amitriptyline effects

Barbiturates: decreased amitriptyline blood level, increased CNS and respiratory effects

Clonidine: hypertensive crisis

CNS depressants (including antihistamines, opioids, sedative-hypnotics): increased CNS depression

Drugs metabolized by CYP-4502D6 (such as other antidepressants, phenothiazines, carbamazepine, class 1C antiarrhythmics): decreased amitriptyline clearance, possibly causing toxicity
Guanethidine: antagonism of antihypertensive action

Levodopa: delayed or decreased levodopa absorption, hypertension

MAO inhibitors: hypotension, tachycardia, potentially fatal reactions

Rifabutin, rifampin, rifapentine: decreased amitriptyline blood level and effects

Selective serotonin reuptake inhibitors: increased risk of toxicity

Sympathomimetics: increased pressor effect of direct-acting sympathomimetics (epinephrine, norepinephrine), possibly causing arrhythmias; decreased pressor effect of indirect-acting sympathomimetics (ephedrine, metaraminol)

Drug-diagnostic tests. *Eosinophils, liver function tests:* increased values

Glucose, granulocytes, platelets, white blood cells: increased or decreased levels

Drug-herbs. *Angel's trumpet, jimsonweed, scopolia:* increased anticholinergic effects

Chamomile, hops, kava, skullcap, valerian: increased CNS depression

St. John's wort: decreased drug blood level and reduced efficacy

Drug-behaviors. *Alcohol use:* increased CNS sedation

Smoking: increased drug metabolism and altered effects

Sun exposure: increased risk of photosensitivity reaction

Patient monitoring

- Evaluate for signs and symptoms of psychosis. If present, discuss possible dosage change with prescriber.
- Assess for changes in patient's mood or mental status.
- 🔊 Monitor for signs and symptoms of depression and assess for suicidal ideation (especially in child or adolescent).
- Check blood pressure for orthostatic hypertension.
- Monitor CBC with white cell differential, glucose levels, and liver function test results.

Patient teaching

- 🔊 Instruct patient, parent, or caregiver to contact prescriber if severe mood changes or suicidal thoughts occur (especially if patient is child or adolescent).
- Tell patient that drug may cause temporary blood pressure decrease if he stands up suddenly. Advise him to rise slowly and carefully.

- Caution patient to avoid driving and other hazardous activities until he knows how drug affects concentration and alertness.
- Advise patient to minimize GI upset by eating small, frequent servings of food and drinking plenty of fluids.
- Inform patient that he'll undergo frequent blood testing during therapy.
- As appropriate, review all other significant and life-threatening adverse reactions and interactions, especially those related to the drugs, tests, herbs, and behaviors mentioned above.

amlodipine besylate

Norvasc

Pharmacologic class: Calcium channel blocker

Therapeutic class: Antihypertensive

Pregnancy risk category C

Action

Inhibits influx of extracellular calcium ions, thereby decreasing myocardial contractility, relaxing coronary and vascular muscles, and decreasing peripheral resistance

Availability

Tablets: 2.5 mg, 5 mg, 10 mg

Indications and dosages

➤ Essential hypertension, chronic stable angina pectoris, and vasospastic angina (Prinzmetal's angina)

Adults: 5 to 10 mg P.O. once daily

Dosage adjustment

- Hepatic impairment
- Elderly patients

Off-label uses

- Pulmonary hypertension
- Raynaud's disease

Contraindications

- Hypersensitivity to drug

Precautions

Use cautiously in:

- aortic stenosis, severe hepatic impairment, heart failure
- elderly patients
- pregnant or breastfeeding patients.
- children.

Administration

- Be aware that this drug may be given alone or with other drugs to relieve hypertension or angina.

Route	Onset	Peak	Duration
P.O.	Unknown	6-9 hr	24 hr

Adverse reactions

CNS: headache, dizziness, drowsiness, light-headedness, fatigue, weakness, lethargy

CV: peripheral edema, angina, bradycardia, hypotension, palpitations

GI: nausea, abdominal discomfort

Musculoskeletal: muscle cramps, muscle pain or inflammation

Respiratory: shortness of breath, dyspnea, wheezing

Skin: rash, pruritus, urticaria, flushing

Interactions

Drug-drug. *Beta-adrenergic blockers:* increased risk of adverse effects

Fentanyl, nitrates, other antihypertensives, quinidine: additive hypotension

Drug-behaviors. *Acute alcohol ingestion:* additive hypotension

Patient monitoring

🚨 Monitor patient for worsening angina.

- Monitor heart rate and rhythm and blood pressure, especially at start of therapy.

🚨 Assess for heart failure; report signs and symptoms (peripheral edema, dyspnea) to prescriber promptly.

Give sublingual nitroglycerin, as prescribed, if patient has signs or symptoms of acute myocardial infarction (especially when dosage is increased).

Patient teaching

- If patient also uses sublingual nitroglycerin, tell him he can take nitroglycerin as needed for acute angina.
- Caution patient to avoid driving and other hazardous activities until he knows how drug affects concentration and alertness.
- As appropriate, review all other significant adverse reactions, especially those related to the drugs and behaviors mentioned above.

amlodipine besylate and atorvastatin calcium

Caduet

Pharmacologic class: Calcium channel blocker, HMG-CoA reductase inhibitor

Therapeutic class: Antihypertensive, antianginal, lipid-lowering agent

Pregnancy risk category X

Action

Amlodipine inhibits influx of extracellular calcium ions, thereby decreasing myocardial contractility, relaxing coronary and vascular muscles, and reducing peripheral resistance. Atorvastatin inhibits HMG-CoA reductase, which catalyzes first step in cholesterol synthesis; this action reduces serum cholesterol and low-density lipoprotein (LDL) levels; atorvastatin also moderately increases concentration of high-density lipoproteins (HDLs).

Availability

Tablets: (amlodipine besylate/atorvastatin calcium) 2.5/10 mg, 2.5/20 mg, 2.5/40 mg, 5/10 mg, 5/20 mg, 5/40 mg,

5/80 mg, 10/10 mg, 10/20 mg, 10/40 mg, 10/80 mg

Indications and dosages

Patients for whom treatment with both amlodipine and atorvastatin is appropriate, such as those with hypertension (used alone or combined with other antihypertensives), coronary artery disease, cardiovascular disease prevention, heterozygous familial or nonfamilial hypercholesterolemia, homozygous familial hypercholesterolemia, elevated serum triglycerides, or dysbetalipoproteinemia

Adults: Dosage individualized based on efficacy of and tolerance for each component. Maximum amlodipine dosage: 10 mg P.O. daily; maximum atorvastatin dosage: 80 mg P.O. daily.

Dosage adjustment

- Alanine aminotransferase (ALT) or aspartate aminotransferase (AST) more than three times upper limit of normal
- Small, frail, or elderly patients

Contraindications

- Hypersensitivity to drug or its components
- Active hepatic disease or unexplained persistent serum transaminase elevations
- Pregnant or breastfeeding patients

Precautions

Use cautiously in:

- hepatic or renal impairment; aortic stenosis; heart failure; hypotension; uncontrolled seizures; myopathy; severe metabolic, endocrine, or electrolyte disorders
- alcohol abuse
- concurrent use of fibric acid derivatives (such as gemfibrozil) or drugs that may decrease endogenous steroids (such as cimetidine, ketoconazole, spironolactone)
- elderly patients

- females of childbearing potential
- children (safety and efficacy not established).

Administration

- Before starting therapy, patient should attempt to control hypercholesterolemia with appropriate diet, exercise, and weight reduction (if obese) and should receive treatment for other underlying medical problems.
- Administer with or without food.
- Don't give with grapefruit juice or antacids.
- Titrate dosage over 7 to 14 days. (Titration may be more rapid if warranted and if patient is assessed frequently.)
- Dosage of amlodipine, atorvastatin, or both may be increased, if appropriate, for additional antianginal, hypotensive, or lipid-lowering effect.

Route	Onset	Peak	Duration
P.O.	Unknown	Unknown	Unknown

Adverse reactions

Amlodipine component

CNS: dizziness, headache, fatigue, somnolence

CV: palpitations, chest pain, **arrhythmias**

EENT: abnormal vision, conjunctivitis, diplopia, eye pain, tinnitus

GI: nausea, abdominal pain, dry mouth

GU: frequent urination, urination disorder, nocturia

Hematologic: purpura, leukopenia, thrombocytopenia

Metabolic: hyperglycemia

Skin: flushing, **erythema multiforme**

Other: edema, increased sweating, thirst

Atorvastatin component

CNS: headache, migraine, asthenia, insomnia, dizziness, malaise, depression, peripheral neuropathy, somnolence, amnesia, abnormal dreams, emotional lability, facial paralysis, incoordination,

hyperkinesia, paresthesia, hypoesthesia, hypertonia

CV: chest pain, palpitations, vasodilation, syncope, hypertension, orthostatic hypotension, phlebitis, angina pectoris, **arrhythmias**

EENT: amblyopia, refraction disorder, eye hemorrhage, glaucoma, dry eyes, hearing loss, tinnitus, parosmia, epis-taxis, rhinitis, sinusitis, pharyngitis

GI: nausea, vomiting, diarrhea, constipation, abdominal pain, dyspepsia, flatulence, enteritis, gastroenteritis, colitis, gastritis, esophagitis, eructation, biliary pain, duodenal ulcer, gastric ulcer, pancreatitis, cholestatic jaundice, tenesmus, melena, dysphagia, cheilitis, glossitis, stomatitis, dry mouth, ulcerative stomatitis, **rectal and gum hemorrhage**

GU: decreased libido, sexual dysfunction, fibrocystic breasts, breast enlargement, metrorrhagia, epididymitis, abnormal ejaculation, urinary tract infection, hematuria, albuminuria, urinary frequency, urinary incontinence, urinary retention, urinary urgency, nocturia, cystitis, dysuria, renal calculus, nephritis, **vaginal and uterine hemorrhage**

Hematologic: anemia, thrombocytopenia

Hepatic: abnormal liver function tests, **hepatitis**

Metabolic: gout

Musculoskeletal: back pain, arthralgia, myalgia, myositis, myasthenia, arthritis, neck rigidity, leg cramps, bursitis, tenosynovitis, tendon contracture

Respiratory: bronchitis, pneumonia, dyspnea, asthma

Skin: rash, pruritus, contact dermatitis, alopecia, dry skin, acne, urticaria, eczema, seborrhea, skin ulcer, ecchymosis, petechiae, photosensitivity

Other: taste loss or alteration; appetite changes; weight gain; infection; lymphadenopathy; accidental injury; flu-like syndrome; peripheral, facial, or generalized edema; allergic reaction

Interactions

Interactions

Drug-drug. *Antacids, colestipol:* decreased atorvastatin level

Azole antifungals, cyclosporine, erythromycin, fibric acid derivatives, niacin, other HMG-CoA inhibitors: increased myopathy risk

Beta-adrenergic blockers: increased risk of adverse effects (amlodipine component)

Cimetidine, ketoconazole, spironolactone: decreased levels or activity of endogenous steroids (atorvastatin component)

Digoxin: increased digoxin level, increased risk of digoxin toxicity

Fentanyl, nitrates, other antihypertensives, quinidine: additive hypotension (amlodipine component)

Hormonal contraceptives: increased estrogen level

Drug-diagnostic tests. *ALT, AST, creatinine kinase:* increased (atorvastatin component)

Blood glucose: increased or decreased
CBCs, platelets: decreased

Drug-food. *Grapefruit juice:* increased drug level, greater risk of adverse effects

Drug-herb. *Red yeast rice:* increased risk of adverse herbal effects

Drug-behaviors. *Acute alcohol ingestion:* additive hypotension (amlodipine component)

Patient monitoring

- Monitor heart rate and rhythm and blood pressure, especially at start of therapy.
- Monitor liver function tests before therapy starts, at 12 weeks, and after dosage increase; thereafter, monitor periodically.
- Watch for signs and symptoms of allergic response.
- 🚨 Monitor patient for worsening angina.
- 🚨 Assess for heart failure; promptly report signs and symptoms (peripheral edema, dyspnea).

- Monitor patients who develop transaminase elevations until these resolve.

🚨 Evaluate for muscle weakness (a symptom of myositis and possibly rhabdomyolysis).

- Measure blood glucose level regularly.

Patient teaching

- Tell patient drug may be taken with or without food.
- Advise patient to minimize GI upset by eating small, frequent servings of food and drinking plenty of fluids.
- Instruct patient to avoid grapefruit juice during therapy.
- 🚨 Urge patient to immediately report unexplained muscle pain, tenderness, or weakness—especially if accompanied by malaise or fever.
- 🚨 Instruct patient to immediately report signs and symptoms of liver damage, such as nausea, fatigue, anorexia, jaundice, dark urine, light-colored stools, intense itching, or tender abdomen.
- 🚨 Tell patient to promptly report chest pain, swelling, or difficulty breathing.
- Caution patient to avoid driving and other hazardous activities until drug effects are known.
- Instruct patient to avoid alcohol use during therapy.
- Advise female with childbearing potential to avoid pregnancy and breastfeeding during therapy.
- As appropriate, review all other significant and life-threatening adverse reactions and interactions, especially those related to the drugs, tests, foods, herbs, and behaviors mentioned above.