

Adrenergic Blocking Drugs

Key Terms

α -adrenergic blocking drugs	cardiac arrhythmia
α/β -adrenergic blocking drugs	first dose effect
β -adrenergic blocking drugs	glaucoma
antiadrenergic drugs	orthostatic hypotension
	pheochromocytoma
	postural hypotension

Chapter Objectives

On completion of this chapter, the student will:

- List the four types of adrenergic blocking drugs.
- Discuss the uses, general drug actions, general adverse reactions, contraindications, precautions, and interactions of the adrenergic blocking drugs.
- Discuss important preadministration and ongoing assessment activities the nurse should perform on the patient taking adrenergic blocking drugs.
- List some nursing diagnoses particular to a patient taking adrenergic blocking drugs.
- Discuss ways to promote an optimal response to therapy, how to manage common adverse reactions, nursing actions that may be taken to minimize orthostatic or postural hypotension, and important points to keep in mind when educating patients about the use of adrenergic blocking drugs.

Adrenergic blocking drugs, also called sympathomimetic blocking drugs, may be divided into four groups:

- **Alpha (α)-adrenergic blocking drugs**—drugs that block α -adrenergic receptors. These drugs produce their greatest effect on α receptors of adrenergic receptors of adrenergic nerves that control the vascular system.
- **Beta (β)-adrenergic blocking drugs**—drugs that block β -adrenergic receptors. These drugs produce their greatest effect on β receptors of adrenergic nerves, primarily the β receptors of the heart.
- **Antiadrenergic drugs**—drugs that block adrenergic nerve fibers. These drugs block the adrenergic nerve fibers within the central nervous system (CNS) or within the peripheral nervous system.
- **α/β -Adrenergic blocking drugs**—drugs that block both α - and β -adrenergic receptors. These drugs act on both α and β nerve fibers.

Each of these groups will be discussed individually followed by information concerning the use of the nursing process for the group as a whole. See the

Summary Drug Table: the Adrenergic Blocking Drugs for a more complete listing of these drugs.

α -ADRENERGIC BLOCKING DRUGS

ACTIONS

Stimulation of α -adrenergic fibers results in vasoconstriction (see Table 22-1 in Chap. 22). If stimulation of these α -adrenergic fibers is interrupted or blocked, the result will be vasodilation. This is the direct opposite of the effect of an adrenergic drug having mainly α activity. Phentolamine (Regitine) is an example of an α -adrenergic blocking drug.

USES

Phentolamine (Regitine) is used for its vasodilating effect on peripheral blood vessels and therefore may be beneficial in the treatment of hypertension caused by

SUMMARY DRUG TABLE ADRENERGIC BLOCKING DRUGS

GENERIC NAME	TRADE NAME*	USES	ADVERSE REACTIONS	DOSAGE RANGES
<i>α-Adrenergic Blocking Agents</i>				
phentolamine <i>fen-tole-a-meen</i>	Regitine	Diagnosis of pheochromocytoma, hypertensive episodes before and during surgery, prevention/treatment of dermal necrosis after IV administration of norepinephrine or dopamine	Weakness, dizziness, flushing, nausea, vomiting, orthostatic hypotension	5 mg IV, IM for tissue necrosis; 5–10 mg in 10 mL saline infiltrated into affected area
<i>β-Adrenergic Blocking Drugs</i>				
acebutolol HCl <i>a-se-byoo'-toe-lol</i>	Sectral, <i>generic</i>	Hypertension, ventricular arrhythmias	Bradycardia, dizziness, weakness, hypotension, nausea, vomiting, diarrhea, nervousness	Hypertension: 400 mg PO in 1–2 doses; arrhythmias: 400–1200 mg/d PO in divided doses
atenolol <i>a-ten'-oh-lol</i>	Tenormin, <i>generic</i>	Hypertension, angina, acute MI	Bradycardia, dizziness, fatigue, weakness, hypotension, nausea, vomiting, diarrhea, nervousness	50–200 mg/d PO; 5 mg IV
betaxolol HCL <i>beh-tax'-oh-lol</i>	Kerlone	Hypertension	Bradycardia, dizziness, hypotension, bronchospasm, nausea, vomiting, diarrhea, nervousness	5–20 mg/d PO
betaxolol HCL <i>beh-tax'-oh-lol</i> (ophthalmic)	Betoptic	Glaucoma	Brief ocular discomfort, tearing	1 gtt BID
bisoprolol <i>bye-sew'-proe-lol</i>	Zebeta	Hypertension	Bradycardia, dizziness, weakness, hypotension, nausea, vomiting, diarrhea, nervousness	5 mg PO QD; maximum dose, 20 mg PO QD
carteolol <i>kar'-tee-oh-lol</i>	Cartrol	Hypertension	Bradycardia, dizziness, weakness, hypotension, nausea, vomiting, diarrhea, nervousness	2.5 mg–10 mg/d PO
esmolol HCL <i>ess'-moe-lol</i>	Brevibloc	Supraventricular tachycardia, noncompensatory tachycardia	Hypotension, weakness, light-headedness, urinary retention	25–500 mcg/kg/min IV
metoprolol <i>me-toe'-proe-lol</i>	Lopressor, Toprol-XL, <i>generic</i>	Hypertension, angina, MI	Dizziness, hypotension, CHF, arrhythmia, nausea, vomiting, diarrhea	100–450 mg/d PO; 5 mg IV; extended release: 50–100 mg/d PO
nadolol <i>nay-doe'-lol</i>	Corgard, <i>generic</i>	Angina, hypertension	Dizziness, hypotension, nausea, vomiting, diarrhea, CHF, cardiac arrhythmias	40–320 mg/d PO
penbutolol <i>pen-byoo'-toe-lol</i>	Levitol	Hypertension	Bradycardia, dizziness, hypotension, nausea, vomiting, diarrhea	20 mg PO QD
pindolol <i>pen'-doe-lol</i>	Visken, <i>generic</i>	Hypertension	Bradycardia, dizziness, hypotension, nausea, vomiting, diarrhea	5–60 mg/d PO in divided doses

(continued)

SUMMARY DRUG TABLE ADRENERGIC BLOCKING DRUGS (Continued)

GENERIC NAME	TRADE NAME*	USES	ADVERSE REACTIONS	DOSAGE RANGES
propranolol <i>pro-pran'-oh-lol</i>	Inderal, <i>generic</i>	Cardiac arrhythmias, MI, angina, hypertension, migraine prophylaxis	Bradycardia, dizziness, hypotension, nausea, vomiting, diarrhea, bronchospasm, hyperglycemia, pulmonary edema	Arrhythmias: 10–30 mg PO TID, QID; hypertension: 40–640 mg/d PO in divided doses; angina: 10–320 mg/d PO in divided doses; life-threatening arrhythmias: up to 1–3 mg IV; migraine: 80–240 mg/d PO in divided doses
sotalol HCl <i>soh'-tal-lol</i>	Betapace, <i>generic</i>	Ventricular arrhythmias	Dizziness, hypotension, nausea, vomiting, diarrhea, respiratory distress	80–320 mg/d PO in divided doses
timolol maleate <i>tye-moe'-lale</i>	Blocadren, <i>generic</i>	Hypertension, MI, migraine prophylaxis	Dizziness, hypotension, nausea, vomiting, diarrhea, pulmonary edema	Hypertension: 10–60 mg/d PO in divided doses; MI: 10 mg PO BID; migraine: 10–30 mg/d PO
timolol maleate (ophthalmic) <i>tye-moe'-lale</i>	Timoptic	Glaucoma	Ocular irritation, tearing	1 gtt BID
<i>α/β-Adrenergic Blocking Agents</i>				
carvedilol <i>car-veh'-dih-lol</i>	Coreg	Hypertension, CHF	Bradycardia, hypotension, cardiac insufficiency, fatigue, dizziness, diarrhea	Hypertension: 6.25–50 mg PO BID; CHF: dose individualized based on patient response; initial dose 3.125 mg PO BID, increased gradually to a maximum dose of 50 mg PO BID
labetalol <i>lah-bet'-ah-lol</i>	Normodyne, Trandate, <i>generic</i>	Hypertension	Fatigue, drowsiness, insomnia, hypotension, impotence, diarrhea	100–400 mg/d PO in divided doses; 20–300 mg IV
<i>Antiadrenergic Drugs: Centrally Acting</i>				
clonidine HCl <i>kloe'-ni-deen</i>	Catapres, Catapres-TTS, <i>generic</i>	Severe pain in patients with cancer, hypertension	Drowsiness, dizziness, sedation, dry mouth, constipation, syncope, dreams, rash	100–2400 mg/d PO; transdermal: 0.1–0.3 mg/24h
guanabenz acetate <i>gwan'-ah-benz</i>	Wyntensin, <i>generic</i>	Hypertension	Dry mouth, sedation, dizziness, headache, weakness, arrhythmias	4–32 mg BID
guanfacine HCL <i>gwan'-fa-sine</i>	Tenex	Hypertension	Dry mouth, somnolence, asthenia, dizziness, headache, constipation, fatigue	1–3 mg/d PO at hs
methyl dopa OR methyldopate HCL <i>meth'-ill-doe-pa-</i> <i>meth'-ill-doe-</i> <i>pate</i>	Aldomet, <i>generic</i>	Hypertension, hypertensive crisis	Bradycardia, aggravation of angina pectoris, heart failure, sedation, headache, rash, nausea, vomiting, nasal stuffiness	250 mg PO BID–TID; maintenance dose, 3 g/d; 250–500 mg q6h IV

SUMMARY DRUG TABLE ADRENERGIC BLOCKING DRUGS (Continued)

GENERIC NAME	TRADE NAME*	USES	ADVERSE REACTIONS	DOSAGE RANGES
Antiadrenergic Drugs: Peripherally Acting				
guanadrel <i>gwan'-ah-drel</i>	Hylorel	Hypertension	Palpitation, chest pain, fatigue, gas, headache, faintness, drowsiness, nocturia, shortness of breath on exertion, weight gain or loss, aching limbs, urination urgency	5–75 mg PO BID
guanethidine monosulfate <i>gwahn-eth'i-deen</i>	Ismelin	Hypertension, renal hypertension	Bradycardia, fluid retention, dizziness, weakness, diarrhea, nausea, dry mouth	10–50 mg/d PO
prazosin <i>pray-zoe'-sin</i>	Minipress, generic	Hypertension	Dizziness, postural hypotension, drowsiness, headache, loss of strength, palpitation, nausea	1–20 mg/d PO in divided doses
terazosin <i>tear-aye'-zoe-sin</i>	Hytrin	Hypertension, benign prostatic hyperplasia (BPH)	Dizziness, postural hypotension, headache, dyspnea, nasal congestion	1–20 mg/d PO

*The term *generic* indicates the drug is available in generic form.

pheochromocytoma, a tumor of the adrenal gland that produces excessive amounts of epinephrine and norepinephrine. The drug is used to control hypertension during preoperative preparation and surgical excision of pheochromocytoma.

Some drugs such as norepinephrine or dopamine are particularly damaging to the surrounding tissues if extravasation (infiltration) occurs during intravenous administration. Phentolamine is used to prevent or treat tissue damage caused by extravasation of these drugs.

ADVERSE REACTIONS

Administration of an α -adrenergic blocking drug may result in weakness, orthostatic hypotension, cardiac arrhythmias, hypotension, and tachycardia.

CONTRAINDICATIONS, PRECAUTIONS, AND INTERACTIONS

α -Adrenergic blocking drugs are contraindicated in patients who are hypersensitive to the drugs and in patients with coronary artery disease. These drugs are used cautiously during pregnancy (Pregnancy Category C)

and lactation, after a recent myocardial infarction, and in patients with renal failure or Raynaud's disease. When phentolamine is administered with epinephrine or ephedrine there is a decreased vasoconstrictor and hypertensive effects.

β -ADRENERGIC BLOCKING DRUGS

ACTIONS

β -Adrenergic blocking drugs, also called β blockers, decrease the activity of the sympathetic nervous system on certain tissues. β -Adrenergic receptors are found mainly in the heart. Stimulation of β receptors of the heart results in an increase in the heart rate. If stimulation of these β -adrenergic fibers is interrupted or blocked, the heart rate decreases and the vessels dilate (Fig. 23-1). These drugs decrease the excitability of the heart, decrease cardiac workload and oxygen consumption, and provide membrane-stabilizing effects that contribute to the antiarrhythmic activity of the β -adrenergic blocking drugs. Examples of β -adrenergic blocking drugs are esmolol (Brevibloc), metoprolol (Lopressor), nadolol (Corgard), and propranolol (Inderal).

β -Adrenergic blocking drugs, such as betaxolol (Betoptic) and timolol (Timoptic), when used topically

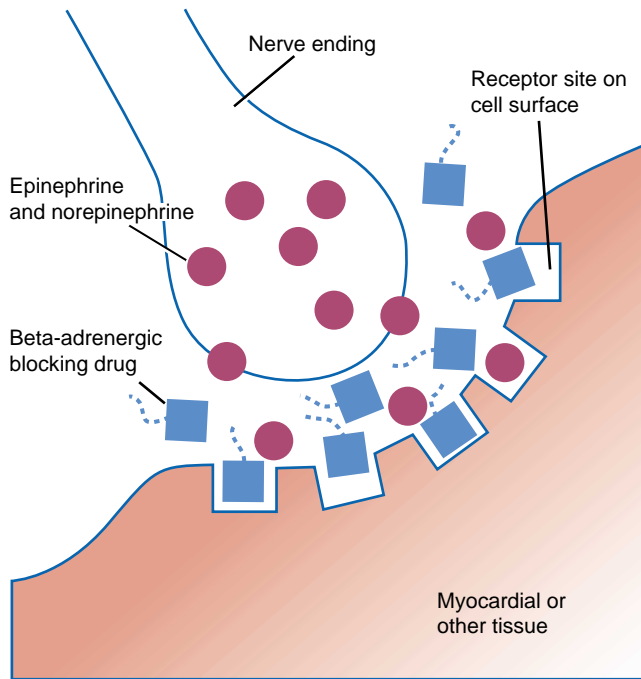


FIGURE 23-1. Beta-adrenergic blocking drugs prevent epinephrine and norepinephrine from occupying receptor sites on cell membranes. This action alters cell functions normally stimulated by epinephrine and norepinephrine, according to the number of receptor sites occupied by the beta-blocking drugs. (Adapted by J. Harley from *Encyclopedia Britannica Medical and Health Annual*. Chicago: Encyclopedia Britannica, 1983.)

as ophthalmic drops, appear to reduce the production of aqueous humor in the anterior chamber of the eye.

USES

These drugs are primarily used in the treatment of hypertension (see the Summary Drug Table: Adrenergic Blocking Drugs; also see Chap. 39) and certain **cardiac arrhythmias** (abnormal rhythm of the heart), such as ventricular arrhythmias or supraventricular tachycardia. They are used to prevent reinfarction in patients with a recent myocardial infarction (1–4 weeks after MI). Some of these drugs have additional uses, such as the use of propranolol for migraine headaches and nadolol for angina pectoris.

β -Adrenergic blocking drugs also can be used topically as ophthalmic eye drops. For example, betaxolol (Betoptic) and timolol (Timoptic) are used in the treatment of glaucoma. **Glaucoma** is a narrowing or blockage of the drainage channels (canals of Schlemm) between the anterior and posterior chambers of the eye. This results in a build-up of pressure (increased intraocular pressure) in the eye. Blindness may occur if glaucoma is left untreated.

ADVERSE REACTIONS

Some of the adverse reactions observed with the administration of β -adrenergic blocking drugs include orthostatic hypotension, bradycardia, dizziness, vertigo, bronchospasm (especially in those with a history of asthma), hyperglycemia, nausea, vomiting, and diarrhea. Many of these reactions are mild and may disappear with therapy. More serious adverse reactions include symptoms of congestive heart failure (dyspnea, weight gain, peripheral edema). Examples of adverse reactions associated with the use of β -adrenergic ophthalmic preparations include headache, depression, cardiac arrhythmias, and bronchospasm.



Gerontologic Alert

Older adults are at increased risk for adverse reactions when taking the β -adrenergic blocking drugs. The nurse should monitor the older adult closely for confusion, heart failure, worsening of angina, shortness of breath, and peripheral vascular insufficiency (eg, cold extremities, paresthesia of the hands, weak peripheral pulses).

CONTRAINDICATIONS, PRECAUTIONS, AND INTERACTIONS

These drugs are contraindicated in patients with an allergy to the β blockers, in patients with sinus bradycardia, second- or third-degree heart block, heart failure, and those with asthma, emphysema, or hypotension. The drugs are used cautiously in patients with diabetes, thyrotoxicosis, and peptic ulcer.

When used with verapamil, the effects of the β blockers are increased. When the β blockers are used with indomethacin, ibuprofen, sulindac, or barbiturates, a decrease in the effects of the β blockers may occur. Diuretics may increase the hypotensive effects of the β -adrenergic blocking drugs. There is a paradoxical hypertensive effect when clonidine is given with the β -adrenergic blocking drugs. There is a risk of increased serum levels and toxic effects of the β -adrenergic blocking drugs when given with lidocaine and cimetidine.

ANTIADRENERGIC DRUGS

ACTIONS

One group of antiadrenergic drugs inhibits the release of norepinephrine (a neurohormone of the sympathetic nervous system, see Chap. 22) from certain adrenergic

nerve endings in the peripheral nervous system. This group is composed of peripherally acting (ie, acting on peripheral structures) antiadrenergic drugs. An example of a peripherally acting antiadrenergic drug is guanethidine (Ismelin). The other antiadrenergic drugs are called centrally acting antiadrenergic drugs because they act on the CNS, rather than on the peripheral nervous system. This group affects specific CNS centers, thereby decreasing some of the activity of the sympathetic nervous system. Although the action of both types of antiadrenergic drugs is somewhat different, the results are basically the same. An example of a centrally acting antiadrenergic drug is clonidine (Catapres-TTS).

USES

Antiadrenergic drugs are used mainly for the treatment of certain cardiac arrhythmias and hypertension (see the Summary Drug Table: Adrenergic Blocking Drugs).

ADVERSE REACTIONS

Some of the adverse reactions associated with the administration of centrally acting antiadrenergic drugs include dry mouth, drowsiness, sedation, anorexia, rash, malaise, and weakness. Adverse reactions associated with the administration of the peripherally acting antiadrenergic drugs include hypotension, weakness, light-headedness, and bradycardia.

CONTRAINDICATIONS, PRECAUTIONS, AND INTERACTIONS

The centrally acting antiadrenergic drugs are contraindicated in active hepatic disease such as acute hepatitis or active cirrhosis and in patients with a history of hypersensitivity to these drugs. The centrally acting antiadrenergic drugs are used cautiously in patients with a history of liver disease, renal function impairment, and during pregnancy and lactation. If methyldopa is administered with anesthetics, there is an increased effect of the anesthetic. The centrally acting antiadrenergic drugs increase the activity of sympathomimetics, possibly causing hypertension. Clonidine decreases the effectiveness of levodopa. When clonidine is administered with β -adrenergic blocking drugs, a potentially life-threatening hypertensive episode may occur.

The peripherally acting antiadrenergic drugs are contraindicated in patients with a hypersensitivity to any of the drugs. Reserpine is contraindicated in patients who have an active peptic ulcer or ulcerative colitis and in

patients who are mentally depressed. Reserpine is used cautiously in patients with a history of depression, in patients with renal impairment or cardiovascular disease, and during pregnancy and lactation. Guanethidine, another peripherally acting antiadrenergic drug, is contraindicated in patients with pheochromocytoma and congestive heart failure. The drug is used cautiously in patients with bronchial asthma and renal impairment and during pregnancy and lactation. Anorexics, haloperidol, the monoamine oxidase inhibitors, tricyclic antidepressants, and phenothiazines decrease the hypotensive effects of guanethidine.

α/β -ADRENERGIC BLOCKING DRUGS

ACTIONS

α/β -Adrenergic blocking drugs block the stimulation of α - and β -adrenergic receptors, resulting in peripheral vasodilation. The two drugs in this category are carvedilol (Coreg) and labetalol (Normodyne).

USES

Labetalol is used in the treatment of hypertension, either alone or in combination with another drug such as a diuretic. Carvedilol is used to treat essential hypertension and in congestive heart failure to reduce progression of the disease.

ADVERSE REACTIONS

Most adverse effects of labetalol are mild and do not require discontinuation of therapy. Examples of the adverse reactions include fatigue, drowsiness, insomnia, weakness, hypotension, diarrhea, dyspnea, and skin rash. Adverse reactions of carvedilol include fatigue, hypotension, cardiac insufficiency, chest pain, bradycardia, dizziness, diarrhea, hypotension, and fatigue.

CONTRAINDICATIONS, PRECAUTIONS, AND INTERACTIONS

Both carvedilol and labetalol are contraindicated in patients with hypersensitivity to the drug, bronchial asthma, decompensated heart failure, and severe bradycardia. The drugs are used cautiously in patients with drug-controlled congestive heart failure, chronic bronchitis, impaired hepatic or cardiac function, in those with diabetes, and during pregnancy (Category C) and lactation.

When either drug is administered with diuretics and other hypotensives, an increased hypotensive effect may occur. When labetalol is administered with cimetidine, the effects of labetalol are increased. Halothane increases the effects of labetalol. When carvedilol is administered with the antidiabetic drugs, there is an increased effectiveness of the antidiabetic drugs. There is an increased effectiveness of clonidine when carvedilol is administered with clonidine. There is an increased serum level of digoxin when digoxin is administered with carvedilol.

NURSING PROCESS

● The Patient Receiving an Adrenergic Blocking Drug

ASSESSMENT

Assessment depends on the drug, the patient, and the reason for administration.

Preadministration Assessment

The nurse establishes an accurate database before any adrenergic blocking drug is administered for the first time. If, for example, the patient has a peripheral vascular disease, the nurse notes the subjective and objective symptoms of the disorder during the initial assessment. If the drug is given for anginal pain, the nurse records the onset, type (eg, sharp, dull, squeezing), radiation, location, intensity, and duration of anginal pain. The nurse also questions the patient regarding any precipitating factors of the anginal pains, such as exertion or emotional stress. Once drug therapy is started, evaluation of the effects of therapy can be made by comparing the patient's current symptoms with the symptoms experienced before therapy was initiated.

Patients with hypertension must have their blood pressure and pulse taken on both arms in sitting, standing, and supine positions before therapy is begun. If the patient has a cardiac arrhythmia, the initial assessment includes taking the pulse rate, determining the pulse rhythm, and noting the patient's general appearance.

Subjective data (ie, the patient's complaints or description of symptoms) also are obtained at this time. The primary health care provider usually orders an electrocardiogram. Additional diagnostic studies and laboratory tests also may be ordered.

If the drug is given to treat congestive heart failure (ie, carvedilol), the patient is assessed for evidence of the disease, such as dyspnea (especially on exertion), peripheral edema, distended neck veins, and cough.

Ongoing Assessment

It is important for the nurse to perform ongoing assessment of the patient receiving adrenergic drug therapy. This assessment often depends on the reason the drug is administered. For all adrenergic blocking drugs, it is

important for the nurse to continually observe these patients for the appearance of adverse reactions. Some adverse reactions are mild, whereas others, such as diarrhea, may cause a problem, especially if the patient is elderly or debilitated.

During therapy with an adrenergic blocking drug for hypertension, the nurse should take the patient's blood pressure before each dose is given. Some patients have an unusual response to the drugs. In addition, some drugs may, in some individuals, decrease the blood pressure at a more rapid rate than other drugs. It is important to monitor the patient's blood pressure on both arms and in the sitting, standing, and supine position for the first week or more of therapy. Once the patient's blood pressure has stabilized, the nurse should take the blood pressure before each drug administration using the same arm and position for each reading. It is a good idea to make a notation on the medication administration record or care plan about the position and arm used for blood pressure determinations. Measuring the blood pressure near the end of the dosing interval or near the end of the day after the last dose of the day helps to determine if the blood pressure is controlled throughout the day.

Ongoing assessment of patients receiving adrenergic blocking drugs for cardiac arrhythmias depends on the type of arrhythmia and the method of treatment. Some cardiac arrhythmias, such as ventricular fibrillation, are life threatening and require immediate attention. Other arrhythmias are serious and require treatment but are not life threatening. The patient with a life-threatening arrhythmia may receive an adrenergic blocking drug, such as propranolol, by the intravenous (IV) route. When these drugs are administered IV, cardiac monitoring is necessary. Patients not in a specialized unit, such as a coronary care unit, are usually transferred to one as soon as possible. When administering these drugs for a life-threatening arrhythmia, it is important for the nurse to continually supervise the patient, frequently monitor the blood pressure and respiratory rate, and perform cardiac monitoring.

When propranolol is administered orally for a less serious cardiac arrhythmia, cardiac monitoring is usually not necessary. The nurse should monitor the patient's blood pressure and pulse rate and rhythm at varying intervals, depending on the length of treatment and the patient's response to the drug.

Nursing Alert

When administering a β -adrenergic blocking drug, such as propranolol (Inderal), the nurse should take an apical pulse rate and blood pressure before giving the drug. If pulse is below 60 bpm or if systolic blood pressure is less than 90 mm Hg, the nurse should withhold the drug and contact the primary health care provider.

Nursing Diagnoses Checklist

- ✓ **Ineffective Tissue Perfusion: Peripheral** related to adverse drug response (hypotension)
- ✓ **Risk for Injury** related to vertigo, dizziness, weakness, and syncope secondary to orthostatic hypotension

If propranolol is given for angina, the nurse should ask the patient about the relief of symptoms and should record responses on the patient's chart.

NURSING DIAGNOSES

Drug-specific nursing diagnoses are highlighted in the Nursing Diagnoses Checklist. Other nursing diagnoses applicable to these drugs are discussed in depth in Chapter 4.

PLANNING

The expected outcomes for the patient depend on the reason for administration of an adrenergic blocking drug but may include an optimal response to drug therapy, management of common adverse drug reactions (diarrhea, constipation, anorexia, fatigue, ineffective tissue perfusion), decreased risk for injury, and an understanding of and compliance with the prescribed drug regimen.

IMPLEMENTATION

Promoting an Optimal Response to Therapy

Most adrenergic blocking drugs may be given without regard to food. However, the nurse should administer propranolol and metoprolol at the same time each day because food may enhance bioavailability. Sotalol is given on an empty stomach because food may reduce absorption of the drug.

Nursing Alert

The nurse should withhold the administration of a β -adrenergic drug, such as propranolol (Inderal), and contact the primary health care provider if the patient has a heart rate of less than 60 bpm or if there is any irregularity in the patient's heart rate or rhythm.

When adrenergic blocking drugs are given to patients to control hypertension, angina, or cardiac arrhythmias, it is important to communicate with the primary care provider about the patient's response to therapy. When given for a cardiac arrhythmia, these drugs can provoke new or worsen existing ventricular arrhythmias. If angina worsens or does not appear to be controlled by the drug, the nurse should contact the

primary care provider immediately. When the drug is administered for hypertension, the nurse monitors the patient for a decrease in the blood pressure. If there is a significant rise in the blood pressure, the nurse administers the dose and notifies the primary care provider immediately because additional drug therapy may be necessary.

When a β -adrenergic blocking ophthalmic preparation, such as timolol, is administered to patients with glaucoma, it is important to insist that they have periodic follow-up examinations by an ophthalmologist. At these examinations, the intraocular pressure should be measured to determine the effectiveness of drug therapy.

Monitoring and Managing Common Adverse Reactions

Some patients may experience one or more adverse drug reactions during treatment with adrenergic blocking drugs. As with any drug, the nurse must report adverse reactions to the primary care provider and record the reactions on the patient's chart. Nursing judgment in this matter is necessary because some adverse reactions are serious or potentially serious in nature. In these cases, the nurse should withhold the next dose of the drug and contact the primary care provider immediately. The nurse also reports to the primary care provider any adverse reactions that pose no serious threat. Adverse reactions that pose no serious threat to the patient's well-being, such as dry mouth or mild constipation, may have to be tolerated by the patient. It is important to assure the patient that, in some instances, these less serious reactions disappear or lessen in intensity after a time.

However, even minor adverse drug reactions can be distressing to the patient, especially when they persist for a long time. Therefore, when possible, the nurse should relieve minor adverse reactions with simple nursing measures. For example, the nurse can assist the patient with dry mouth by giving frequent sips of water or by allowing the patient to suck on a piece of hard candy (provided that the patient does not have diabetes or is not on a special diet that limits sugar intake) to relieve a dry mouth. The nurse can help relieve a patient's constipation by encouraging increased fluid intake, unless extra fluids are contraindicated. The primary care provider also may order a laxative or stool softener. It is important for the nurse to maintain a daily record of bowel elimination. The nurse can help the patient minimize certain gastrointestinal side effects, such as anorexia, diarrhea, and constipation by administering drugs at a specific time in relation to meals, with food, or with antacids.

MANAGING HYPOTENSION. Administration of the adrenergic blocking drugs may cause hypotension. If the

drug is administered for hypertension, then a decrease is expected.

Nursing Alert

If a significant decrease in the blood pressure (a drop of 20 mm Hg systolic or a systolic below 90 mm Hg) occurs after a dose of an adrenergic blocking drug, the nurse should withhold the drug and notify the primary care provider immediately. A dosage reduction or discontinuation of the drug may be necessary. Some adrenergic blocking drugs (eg, prazosin or terazosin) may cause a “first dose” effect. A first dose effect occurs when the patient experiences marked hypotension (or postural hypotension) and syncope with sudden loss of consciousness with the first few doses of the drug.

The first dose effect may be minimized by decreasing the initial dose and administering the dose at bedtime. The dosage can then be slowly increased every 2 weeks until a full therapeutic effect is achieved. If the patient experiences syncope, the nurse places the patient in a recumbent position and treats supportively. This effect is self-limiting and in most cases does not recur after the initial period of therapy. Light-headedness and dizziness are more common than loss of consciousness. The section below discusses these effects and provides interventions for management.

DECREASING THE PATIENT’S RISK FOR INJURY. On occasion, patients receiving an adrenergic blocking drug may experience postural or orthostatic hypotension. **Postural hypotension** is characterized by a feeling of light-headedness and dizziness when the patient suddenly changes from a lying to a sitting or standing position, or from a sitting to a standing position. **Orthostatic hypotension** is characterized by similar symptoms as postural hypotension and occurs when the patient changes or shifts position after standing in one place for a long period. The nurse can help to minimize these adverse reactions as follows:

- Instruct patients to rise slowly from a sitting or lying position.
- Provide assistance for the patient getting out of a bed or a chair if symptoms of postural hypotension are severe. Place the call light nearby and instruct patients to ask for assistance each time they get in and out of a bed or a chair.
- Assist the patient in bed to a sitting position and have the patient sit on the edge of the bed for about 1 minute before ambulating.
- Help seated patients to a standing position and instruct them to stand in one place for about 1 minute before ambulating.
- Remain with the patient while he or she is standing in one place, as well as during ambulation.

- Instruct the patient to avoid standing in one place for prolonged periods. This is rarely a problem in the hospital but should be included in the patient and family discharge teaching plan.
- Teach the patient to avoid taking hot showers or baths, which tend to increase vasodilation.

Symptoms of postural or orthostatic hypotension often lessen with time, and the patient may be allowed to get out of bed or chair slowly without assistance. The nurse must exercise good judgment in this matter. Allowing the patient to rise from a lying or sitting position without help is done only when the determination has been made that the symptoms have lessened and ambulation poses no danger of falling.

Educating the Patient and Family

Some patients do not adhere to the prescribed drug regimen for a variety of reasons, such as failure to comprehend the prescribed regimen, the cost of drug therapy, and failure to understand the importance of continued and uninterrupted therapy. If the nurse detects failure to adhere to the prescribed drug regimen, he or she should investigate the possible cause of the problem. In some instances, financial assistance may be necessary; in other instances, patients need to know why they are taking a drug and why therapy must be continuous to attain and maintain an optimal state of health and well-being.

The nurse should describe the drug regimen and stress the importance of continued and uninterrupted therapy when teaching the patient who is prescribed an adrenergic blocking drug. Patient education will differ according to the reason the adrenergic blocking drug is prescribed.

EDUCATING THE PATIENT WITH HYPERTENSION, CARDIAC ARRHYTHMIA, OR ANGINA. If a β -adrenergic blocking drug has been prescribed for hypertension, cardiac arrhythmia, angina, or other cardiac disorders, the patient must have a full understanding of the treatment regimen. In some instances, the primary care provider may advise the hypertensive patient to lose weight or eat a special diet, such as a low-salt diet. A special diet also may be recommended for the patient with angina or a cardiac arrhythmia. When appropriate, the nurse should stress the importance of diet and weight loss in the therapy of hypertension.

It is important to include the following additional points in the teaching plan for the patient with hypertension, angina, or a cardiac arrhythmia:

- Do not stop taking the drug abruptly, except on the advice of the primary care provider. Most of these drugs require that the dosage be gradually decreased to prevent precipitation or worsening of adverse effects.

- Notify the primary health care provider promptly if adverse drug reactions occur.
- Observe caution while driving or performing other hazardous tasks because these drugs (β -adrenergic blockers) may cause drowsiness, dizziness, or light-headedness.
- Immediately report any signs of congestive heart failure (weight gain, difficulty breathing, or edema of the extremities).
- Do not use any nonprescription drug (eg, cold or flu preparations or nasal decongestants) unless use of a specific drug has been approved by the primary care provider.
- Inform dentists and other primary care providers of therapy with this drug.
- Keep all primary care provider appointments because close monitoring of therapy is essential.
- Check with a primary health care provider or pharmacist to determine if the drug is to be taken with food or on an empty stomach.

In addition, when an adrenergic blocking drug is prescribed for hypertension, the primary care provider may want the patient to monitor his or her own blood pressure between office visits. This may enable the number of visits to the primary care provider office to be reduced and will help the patient learn to manage his or her own health (see Patient and Family Teaching Checklist: Monitoring Blood Pressure).



Patient and Family Teaching Checklist

Monitoring Blood Pressure

The nurse:

- ✓ Teaches the patient and a family member how to take an accurate blood pressure reading. This involves choosing the correct instrument and teaching the patient the steps to taking a blood pressure reading.
- ✓ Supervises the patient and a family member during several trial blood pressure readings to ensure accuracy of the measurements.
- ✓ Suggests to the patient that the same arm and body position be used each time the blood pressure is taken.
- ✓ Explains that the blood pressure can vary slightly with emotion, the time of day, and the position of the body.
- ✓ Explains that a slight change in readings is normal, but if a drastic change in either or both the systolic or diastolic readings occurs, the patient should contact the primary health care provider as soon as possible.

EDUCATING THE PATIENT WITH GLAUCOMA. When an adrenergic blocking drug has been prescribed for glaucoma, the nurse demonstrates the technique of eye drop instillation and explains the prescribed treatment regimen to the patient. Adherence to the instillation schedule is stressed because omitting or discontinuing the drug without approval of the primary care provider may result in a marked increase in intraocular pressure, which can lead to blindness. The nurse should tell patients with glaucoma who are using adrenergic blocking eye drops to contact their primary health care provider if eye pain, excessive tearing, or any change in vision occurs.

EVALUATION

- The therapeutic effect is achieved and hypertension, cardiac arrhythmia, or glaucoma is controlled.
- Adverse reactions are identified, reported to the primary health care provider, and managed successfully through appropriate nursing interventions.
- No evidence of injury related to orthostatic or postural hypotension is seen.
- The patient and family demonstrate an understanding of the drug regimen.

● Critical Thinking Exercises

1. Ms. Martin has been prescribed propranolol (Inderal) for hypertension. She arrives at the outpatient clinic and tells you that she is having episodes of dizziness and at times feels as if she is going to faint. Discuss how you would investigate this problem and what information you could give Ms. Martin that might help her.
2. Mr. Garcia was prescribed labetalol (Normodyne) 100 mg orally twice daily for hypertension. The health care provider wants him to monitor his blood pressure once daily. Determine what assessments you would make. Develop a teaching plan for Mr. Garcia that would help him in monitoring his blood pressure and taking labetalol.
3. A new nurse says that she is unsure about how the adrenergic blocking drugs work. Discuss the four types of adrenergic blocking drugs and how each one works within the body.

● Review Questions

1. A patient is to receive a β -adrenergic drug for hypertension. Before the drug is administered the most important assessment the nurse performs is _____.
 - A. weighing the patient
 - B. obtaining blood for laboratory tests
 - C. taking a past medical history
 - D. taking the blood pressure on both arms

2. When an adrenergic blocking drug is given for a life-threatening cardiac arrhythmia, which of the following activities would the nurse expect to be a part of patient care?
 - A. daily ECGs
 - B. fluid restriction of 1000 mL per day
 - C. daily weights
 - D. cardiac monitoring
3. To prevent complications when administering a β -adrenergic blocking drug to an elderly patient, the nurse would be particularly alert for _____.
 - A. vascular insufficiency (eg, weak peripheral pulses and cold extremities)
 - B. complaints of an occipital headache
 - C. insomnia
 - D. hypoglycemia
4. The patient with glaucoma will likely receive a(n) _____.
 - A. α/β -adrenergic blocking drug
 - B. α -adrenergic blocking drug
 - C. β -adrenergic blocking drug
 - D. antiadrenergic drug

● Medication Dosage Problems

1. The primary health care provider prescribes 60 mg propranolol oral solution. The drug is available in an oral solution with a strength of 4 mg/mL. The nurse administers _____.
2. A patient is prescribed 12.5 mg of carvedilol. The drug on hand is 3.125-mg tablets. The nurse administers _____.