

CHAPTER 18

Adrenergic-Blocking Drugs

Adrenergic Blockers

- Bind to adrenergic receptors, but inhibit or block stimulation of the sympathetic nervous system (SNS)
- α (alpha)-blockers and β (beta)-blockers

Adrenergic Blockers (cont'd)

- Have the opposite effect of adrenergic drugs
- Also known as:
 - Adrenergic antagonists
 - Sympatholytics
 - α -blockers, β -blockers, or α - β -blockers

Adrenergic Blockers (cont'd)

Sympatholytics inhibit—or LYSE—
sympathetic stimulation

Adrenergic Blockers (cont'd)

Classified by the type of adrenergic receptor they block

- α_1 and α_2 receptors
- β_1 and β_2 receptors

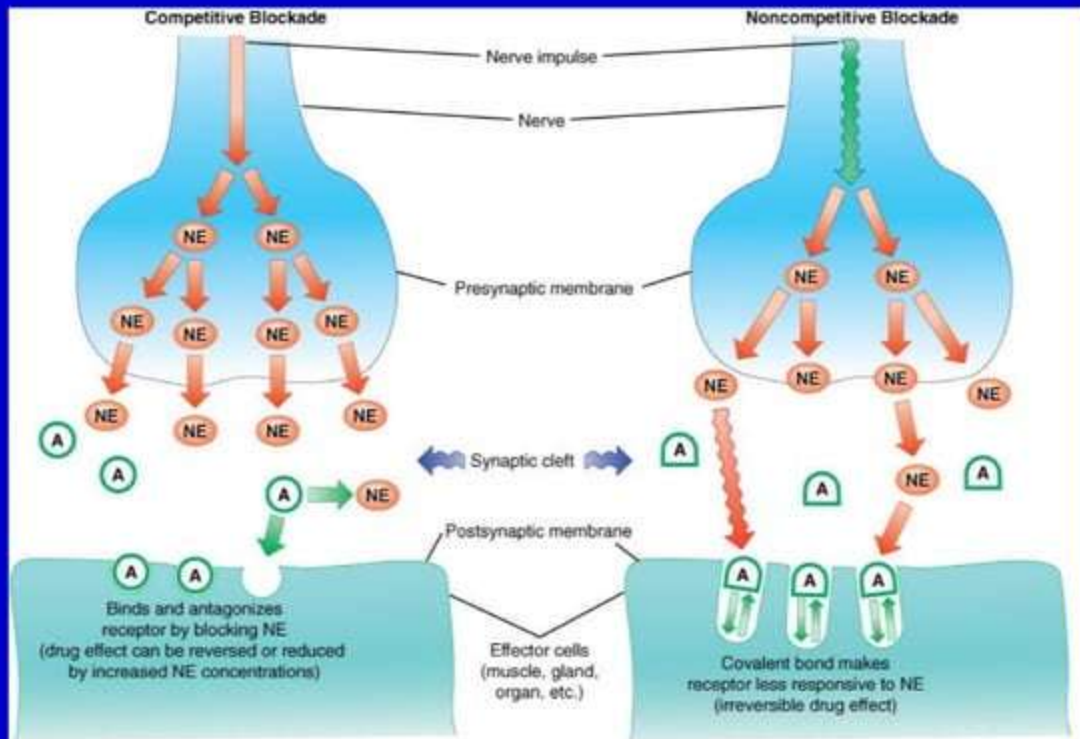


Fig. 18-1. Mechanisms for α -adrenergic competitive and noncompetitive blockade by α -blockers. A, α -blocker; NE, norepinephrine.

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Drug Effects and Indications

Ergot alkaloids (α -blockers)

- Constrict dilated arterioles in the brain
- Used to treat vascular headaches (migraines)
- Stimulate uterine contractions (oxytocics) and induce local vasoconstriction
- Used to control postpartum bleeding

Drug Effects and Indications (cont'd)

α -blockers

- Cause both arterial and venous dilation, reducing peripheral vascular resistance and BP
- Used to treat hypertension
- Effect on receptors on prostate gland and bladder decreased resistance to urinary outflow, thus reducing urinary obstruction and relieving effects of BPH

Drug Effects and Indications (cont'd)

α -blockers (cont'd)

- Used to control and prevent hypertension in patients with pheochromocytoma
- Phentolamine
 - Quickly reverses the potent vasoconstrictive effects of extravasated vasopressors such as norepinephrine or epinephrine
 - Restores blood flow and prevents tissue necrosis

α -Blockers: Adverse Effects

<u>Body System</u>	<u>Adverse Effects</u>
Cardiovascular	Palpitations, orthostatic hypotension, tachycardia, edema, dysrhythmias, chest pain
CNS	Dizziness, headache, drowsiness, anxiety, depression, vertigo, weakness, numbness, fatigue

α -Blockers: Adverse Effects (cont'd)

Body System

Adverse Effects

Gastrointestinal

Nausea, vomiting, diarrhea,
constipation, abdominal pain

Other

Incontinence, nosebleed,
tinnitus, dry mouth, pharyngitis,
rhinitis

Common α -Blockers

- ergotamine tartrate (Ergostat)
- phenoxybenzamine HCl (Dibenzylamine)
- phentolamine (Regitine)
- prazosin (Minipress)
- tolazoline (Priscoline)

β -Blockers

- Block stimulation of β receptors in the SNS
- Compete with norepinephrine and epinephrine
- Selective and nonselective β -blockers
- Nonselective β -blockers block both β_1 and β_2 receptors

β Receptors

β_1 receptors

- Located primarily on the heart
- β -blockers selective for these receptors are called cardioselective β -blockers

β Receptors (cont'd)

β_2 receptors

- Located primarily on smooth muscles of bronchioles and blood vessels

Mechanism of Action

Cardioselective (β_1)

- Reduces SNS stimulation of the heart
- Decreases heart rate
- Prolongs SA node recovery
- Slows conduction rate through the AV node
- Decreases myocardial contractility, thus reducing myocardial oxygen demand

Mechanism of Action (cont'd)

Nonselective (β_1 and β_2)

- Effects on heart: Same as cardioselective
- Bronchioles: Constriction, resulting in narrowing of airways and shortness of breath
- Blood vessels: Vasoconstriction
- Other effects

Indications

- Antiangina: Decreases demand for myocardial oxygen
- Cardioprotective: Inhibits stimulation from circulating catecholamines
- Class II antidysrhythmics

Indications (cont'd)

- Antihypertensive
- Some are used to treat heart failure
- Treatment of migraine headaches
- Glaucoma (topical use)

Adverse Effects: β -Blockers

<u>Body System</u>	<u>Adverse Effects</u>
Blood	Agranulocytosis, thrombocytopenia
Cardiovascular	AV block, bradycardia, heart failure, peripheral vascular insufficiency
CNS	Dizziness, mental depression, lethargy, hallucinations

Adverse Effects: Adrenergic-Blocking Drugs

β -blockers

Body System

Adverse Effects

Gastrointestinal

Nausea, dry mouth, vomiting,
diarrhea, cramps, ischemic
colitis

Other

Impotence, rash, alopecia,
bronchospasm

β -Blockers: Examples

- acebutolol (Sectral)
- carvedilol (Coreg)
- labetalol (Trandate)
- metoprolol (Lopressor)
- atenolol (Tenormin)
- esmolol (Brevibloc)
- sotalol (Betapace)
- propranolol (Inderal)

Adrenergic-Blocking Drugs: Nursing Implications

- Assess for allergies and history of COPD, hypotension, cardiac dysrhythmias, bradycardia, heart failure, or other cardiovascular problems
 - Any preexisting condition that might be exacerbated by the use of these drugs might be a *contraindication* to their use

Adrenergic-Blocking Drugs: Nursing Implications (cont'd)

- Remember that α -blockers may precipitate hypotension
- Remember that some β -blockers may precipitate bradycardia, hypotension, heart block, heart failure, and bronchoconstriction

Adrenergic-Blocking Drugs: Nursing Implications (cont'd)

- Avoid OTC medications because of possible interactions
- Possible drug interactions may occur with:
 - Antacids (aluminum hydroxide type)
 - Antimuscarinics/anticholinergics
 - Diuretics and cardiovascular drugs
 - Neuromuscular blocking drugs
 - Oral hypoglycemic drugs

Adrenergic-Blocking Drugs: Nursing Implications (cont'd)

- Encourage patients to take medications as prescribed
- These medications should never be stopped abruptly
- Report constipation or the development of any urinary hesitancy or bladder distention

Adrenergic-Blocking Drugs: Nursing Implications (cont'd)

- Teach patients to change positions slowly to prevent or minimize postural hypotension
- Avoid caffeine (excessive irritability)
- Avoid alcohol ingestion and hazardous activities until blood levels become stable
- Patients should notify their physician if palpitations, dyspnea, nausea, or vomiting occurs

β -Blocking Drugs: Nursing Implications

- Rebound hypertension or chest pain may occur if this medication is discontinued abruptly
- Patients should notify their physician if they become ill and unable to take medication
- Inform patients that they may notice a decrease in their tolerance for exercise; dizziness and fainting may occur with increased activity. Notify the physician if these problems occur

β -Blocking Drugs: Nursing Implications (cont'd)

Patients should report the following to their physician:

- Weight gain of more than 2 pounds in 1 day or 5 lb within 1 week
- Edema of the feet or ankles
- Shortness of breath
- Excessive fatigue or weakness
- Syncope or dizziness

Adrenergic-Blocking Drugs: Nursing Implications

Monitor for adverse effects

Monitor for therapeutic effects

- Decreased chest pain in patients with angina
- Return to normal BP and P
- Other specific effects, depending on the use