**CNS STIMULANTS: Amphetamines**

**HOW DO THEY WORK?**

"Action"

Amphetamines are sympathomimetic “adrenergic”. Which means that they mimicking a response from the sympathetic nervous system, causing the CNS to speed up, resulting in:

- Elevated blood pressure
- Wakefulness
- Increased or decreased pulse rate

**INDICATIONS**

- ADHD
- Drug-induced respiratory depression
- Post Anesthesia respiratory depression, without reduction of analgesia
- Narcolepsy
- Obstructive sleep apnea
- Exogenous obesity
- Fatigue (caffeine)

**ADVERSE REACTIONS**

- Excessive CNS stimulation, headache, dizziness
- Apprehension, disorientation, hyperactivity
- Nausea, vomiting, cough, dyspnea
- Urinary retention, tachycardia, palpitations

**INTERACTIONS**

- **Anesthetics**: Increased risk of cardiac arrhythmias
- **Theophylline**: Increased risk of hyperactive behaviors
- **Oral contraceptives**: Decreased effectiveness of oral contraceptive when taken with modafinil

**CONTRAINDICATIONS**

- Known hypersensitivity
- Convulsive disorders
- Ventilation disorders (COPD)
- Cardiac problems
- Hypertension
- Hyperthyroidism
- Glaucoma
- Pregnancy

**NURSING MANAGEMENT**

- An increased risk of suicidal ideation in children and adolescents has been found when using the drug atomoxetine (Strattera). Patients with ADHD started on atomoxetine should be monitored carefully for suicidal thoughts or behaviors.
- Stimulants enhance dopamine transmission to areas of the brain that interpret well-being. To maintain pleasurable feelings, people continue the use of stimulants, which leads to their abuse and the potential for addiction.
- Older adults are especially sensitive to the effects of the CNS stimulants and may exhibit excessive anxiety, nervousness, insomnia, and mental confusion. Cardiovascular disorders, common in the older adult, may be worsened by the CNS stimulants. Careful monitoring is important because these reactions may result in the need to discontinue use of the drug.
- **ADHD**: Give the drug in the morning 30 to 45 minutes before breakfast and before lunch. Do not give the drug in the late afternoon.
- **Narcolepsy**: Keep a record of the number of times per day that periods of sleepiness occur, and bring this record to each visit to the primary health care provider or clinic.
- **Amphetamines and anorexiant**: These drugs are taken early in the day to avoid insomnia. Do not increase the dose or take the drug more frequently, except on the advice of the primary health care provider.
- **Caffeine (oral, nonprescription)**: Over-the-counter caffeine preparations should be avoided if the individual has a history of heart disease, high blood pressure, or stomach ulcers.

**Generic** | **Trade** | **Use** | **Dose**
---|---|---|---
amphetamine | N/A | Narcolepsy, ADHD, exogenous obesity | Narcolepsy: 5-60 mg/day orally in divided doses. ADHD: 5 mg BID, increase by 10 mg/wk until desired effect.
dexamfetamine | Focalin | ADHD | 2.5 mg orally BID; maximum dosage, 20 mg/day
methamphetamine | Desoxyn | ADHD, exogenous obesity | ADHD: up to 25 mg/day orally. Obesity: 5 mg orally 30 min before meals
**CNS Stimulants: Analeptics**

**HOW DO THEY WORK?**

“Action”

Drugs that stimulate the respiratory center of the brain and cardiovascular system, used with narcolepsy and as an adjuvant treatment for obstructive sleep apnea

**Indications**
- Narcolepsy
- Obstructive sleep apnea

**Contraindications**
- Known hypersensitivity
- Convulsive disorders
- Ventilation disorders (COPD)
- Cardiac problems
- Hypertension
- Hyperthyroidism
- Glaucoma
- Pregnancy

**Interactions**
- Anesthetics: Increased risk of cardiac arrhythmias
- Theophylline: Increased risk of hyperactive behaviors
- Oral contraceptives: Decreased effectiveness of oral contraceptive when taken with modafinil

**Adverse Reactions**
- Excessive CNS stimulation, headache, dizziness
- Apprehension, disorientation, hyperactivity
- Nausea, vomiting, cough, dyspnea
- Urinary retention, tachycardia, palpitations

**Facts**
Stimulants enhance dopamine transmission to areas of the brain that interpret well-being. To maintain pleasurable feelings, people continue the use of stimulants, which leads to their abuse and the potential for addiction. (Ford 190)

**Nurse Management**
An increased risk of suicidal ideation in children and adolescents has been found when using the drug atomoxetine (Strattera). Patients with ADHD started on atomoxetine should be monitored carefully for suicidal thoughts or behaviors.
- Stimulants enhance dopamine transmission to areas of the brain that interpret well-being. To maintain pleasurable feelings, people continue the use of stimulants, which leads to their abuse and the potential for addiction.
- Older adults are especially sensitive to the effects of the CNS stimulants and may exhibit excessive anxiety, nervousness, insomnia, and mental confusion. Cardiovascular disorders, common in the older adult, may be worsened by the CNS stimulants. Careful monitoring is important because these reactions may result in the need to discontinue use of the drug.
- ADHD: Give the drug in the morning 30 to 45 minutes before breakfast and before lunch. Do not give the drug in the late afternoon.
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- Amphetamines and anorexiants: These drugs are taken early in the day to avoid insomnia. Do not increase the dose or take the drug more frequently, except on the advice of the primary health care provider.
- Caffeine (oral, nonprescription): Over-the-counter caffeine preparations should be avoided if the individual has a history of heart disease, high blood pressure, or stomach ulcers.

<table>
<thead>
<tr>
<th>Generic</th>
<th>Trade</th>
<th>Use</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>armodafinil</td>
<td>Nuvigil</td>
<td>Narcolepsy, obstructive sleep apnea, sleepiness due to shift work</td>
<td>150–250 mg/day orally in a single morning dose</td>
</tr>
<tr>
<td>doxapram</td>
<td>Dopram</td>
<td>Respiratory depression: postanesthesia, drug-induced, acute respiratory insufficiency superimposed on COPD</td>
<td>0.5–1 mg/kg IV</td>
</tr>
<tr>
<td>modafinil</td>
<td>Provigil</td>
<td>Narcolepsy, obstructive sleep apnea</td>
<td>200–400 mg/day orally</td>
</tr>
</tbody>
</table>
CNS stimulants: Anorexiants

**How Do They Work?**

"Action"

Anorexiants are drugs pharmacologically similar to the amphetamines. Their ability to suppress the appetite is thought to be due to their action on the appetite center in the hypothalamus. (Ford 190)

**Indications**

Treatment of obesity via appetite suppression

**Contraindications**

- Known hypersensitivity
- Convulsive disorders
- Ventilation disorders (COPD)
- Cardiac problems
- Hypertension
- Hyperthyroidism
- Glaucoma
- Pregnancy

**Adverse Reactions**

- Excessive CNS stimulation, headache, dizziness
- Apprehension, disorientation, hyperactivity
- Nausea, vomiting, cough, dyspnea
- Urinary retention, tachycardia, palpitations

**Interactions**

- Anesthetics: Increased risk of cardiac arrhythmias
- Theophylline: Increased risk of hyperactive behaviors
- Oral contraceptives: Decreased effectiveness of oral contraceptive when taken with modafinil

**Education**

- These drugs are intended for patients with chronic weight management issues when used with an approved diet and physical activity program.
- These drugs should only be used for obesity (body mass index [BMI] of 30 or greater) or overweight (BMI of 27) when comorbid conditions exist, such as hypertension, type 2 diabetes, or dyslipidemia.
- Never take over-the-counter weight loss preparations with these drugs.
- If you have not achieved 5% weight loss in 12 weeks, contact your primary health care provider; never increase the dose to speed up or increase weight loss.
- Call your primary health care provider immediately if you experience mental changes (agitation or hallucinations), rapid heartbeat, dizziness, lack of coordination, or feelings of warmth. This may be a condition called neuroleptic malignant syndrome, which needs emergent treatment.
- Be aware of possible impairment in the ability to drive or perform hazardous tasks.
- Avoid other stimulants, including those containing caffeine such as coffee, tea, and cola drinks
- Read labels of foods and nonprescription drugs for possible stimulant content.
- Women: Use pregnancy protection and do not breastfeed when using these drugs.
- Men: Seek immediate medical treatment if you have an erection lasting more than 4 hours. (Ford 192)

**Nursing Management**

- An increased risk of suicidal ideation in children and adolescents has been found when using the drug atomoxetine (Strattera). Patients with ADHD started on atomoxetine should be monitored carefully for suicidal thoughts or behaviors.
- Stimulants enhance dopamine transmission to areas of the brain that interpret well-being. To maintain pleasurable feelings, people continue the use of stimulants, which leads to their abuse and the potential for addiction.
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- Amphetamines and anorexiants: These drugs are taken early in the day to avoid insomnia. Do not increase the dose or take the drug more frequently, except on the advice of the primary health care provider.
- Caffeine (oral, nonprescription): Over-the-counter caffeine preparations should be avoided if the individual has a history of heart disease, high blood pressure, or stomach ulcers.

**Table: Uses and Dosages**

<table>
<thead>
<tr>
<th>Generic</th>
<th>Trade</th>
<th>Use</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>benzphetamine</td>
<td>Didrex</td>
<td>Obesity</td>
<td>25-50 mg orally 1-3 times/day</td>
</tr>
<tr>
<td>phendimetrazine</td>
<td>Bontril</td>
<td>Obesity</td>
<td>35 mg orally 2-3 times/day</td>
</tr>
</tbody>
</table>
**CNS DRUGS: CHOLINESTERASE INHIBITORS**

**HOW DO THEY WORK? “ACTION”**

The cholinesterase inhibitors act to increase the level of acetylcholine in the central nervous system (CNS) by inhibiting its breakdown and slowing neural destruction. (Ford 197)

**INDICATIONS**

Cholinesterase inhibitors are used to treat early and moderate stages of dementia associated with AD. Their use for severe cognitive decline as well as other dementias, such as vascular or Parkinson’s dementia, is being studied. (Ford 198)

**CONTRAINDICATIONS**

❖ Cholinesterase inhibitors are contraindicated in patients with hypersensitivity to the drugs and during pregnancy and lactation (pregnancy category B)
❖ These drugs are used to treat dementia and should not be used to treat confused patients experiencing delirium.

**INTERACTIONS**

❖ Anticholinergics: Decreased effectiveness of anticholinergics
❖ Nonsteroidal anti-inflammatory drugs: Increased risk of GI bleeding
❖ Theophylline: Increased risk of theophylline toxicity

**ADVERSE REACTIONS**

❖ Anorexia, nausea, vomiting, diarrhea
❖ Dizziness and headache

<table>
<thead>
<tr>
<th>Dementia Vs. Delirium</th>
<th>Delirium</th>
<th>Dementia</th>
</tr>
</thead>
<tbody>
<tr>
<td>onset</td>
<td>Sudden change</td>
<td>Progressive change</td>
</tr>
<tr>
<td>presentation</td>
<td>Affects senses</td>
<td>Affects memory and judgment</td>
</tr>
<tr>
<td>reversibility</td>
<td>Yes, can slow progression with drugs, need to change environment for patient to remain safe</td>
<td>No, can slow progression with drugs, need to change environment for patient to remain safe</td>
</tr>
</tbody>
</table>

**NURSING MANAGEMENT**

❖ Should cholinesterase inhibitor therapy be discontinued, individuals lose any benefit they have received from the drugs within 6 weeks.
❖ Keep all appointments with the primary care provider or clinic, because close monitoring of therapy is essential. Dose changes may be needed to achieve the best results.
❖ Report any unusual changes or physical effects to the primary health care provider.
❖ Take the drug exactly as directed. Do not increase, decrease, or omit a dose or discontinue use of this drug unless directed to do so by the primary health care provider.
❖ Do not drive or perform other hazardous tasks if drowsiness occurs. Discuss with your primary health care provider when patients should be evaluated for their continued ability to drive.
❖ Do not take any nonprescription drug before talking to your primary health care provider.
❖ Keep track of when the drug is taken. Marking the calendar, cell phone alarms, or a pill counter that holds the medicine for each day of the week may be helpful tools to remind the patient to take the medication or determine whether the medication has been taken for the day.
❖ Notify the primary care provider if the following adverse reactions are experienced for more than a few days: nausea, diarrhea, difficulty sleeping, vomiting, or loss of appetite.
❖ Immediately report the occurrence of the following adverse reactions: severe vomiting, dehydration, or changes in neurologic functioning.
❖ Notify the primary care provider if the patient has a history of ulcers, feels faint, experiences severe stomach pains, vomits blood or material that resembles coffee grounds, or has bloody or black stools.
❖ Remember that these drugs do not cure AD but slow the mental and physical degeneration associated with the disease. The drug must be taken routinely to slow the progression.

**HERBAL CONSIDERATIONS**

Ginkgo, one of the oldest herbs in the world, has many beneficial effects. It is thought to improve memory and brain function and enhance circulation to the brain, heart, limbs, and eyes. However, research is inconclusive as to whether or not his is true. Ginkgo is contraindicated in patients taking selective serotonin reuptake inhibitor (SSRI) or monoamine oxidase inhibitor (MAOI) antidepressants because of the risk of a toxic reaction.

<table>
<thead>
<tr>
<th>Generic</th>
<th>Trade</th>
<th>Use</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>donepezil</td>
<td>Aricept</td>
<td>Mild to severe dementia due to AD, memory improvement in dementia due to stroke, vascular disease, multiple sclerosis</td>
<td>5–10 mg/day orally</td>
</tr>
<tr>
<td>galantamine</td>
<td>Razadyne</td>
<td>Mild to moderate (AD) dementia</td>
<td>16–24 mg BID orally</td>
</tr>
</tbody>
</table>

**Dementia Vs. Delirium**

- **onset**: Sudden change (Delirium), Progressive change (Dementia)
- **presentation**: Affects senses (Delirium), Affects memory and judgment (Dementia)
- **reversibility**: Yes, when cause such as oxygen or chemical imbalances or infections found and treated (Delirium), No, can slow progression with drugs, need to change environment for patient to remain safe (Dementia)

**Generic**

- donepezil
- galantamine

**Trade**

- Aricept
- Razadyne

**Use**

- Mild to severe dementia due to AD, memory improvement in dementia due to stroke, vascular disease, multiple sclerosis
- Mild to moderate (AD) dementia
**PNS DRUGS: ADRENERGICS**

**HOW DO THEY WORK?**

*“Action”*

The purpose of stimulating the sympathetic (adrenergic) nerves is to divert blood flow to the vital organs so that the body can deal with a stressful situation (the fight-or-flight response). In general, adrenergic drugs produce one or more of the following responses in varying degrees:

- **Central nervous system**—wakefulness, quick reaction to stimuli, quickened reflexes
- **Autonomic nervous system**—relaxation of the smooth muscles of the bronchi, constriction of blood vessels, sphincters of the stomach, dilation of coronary blood vessels, decrease in gastric motility
- **Heart**—increase in the heart rate and cardiac force
- **Metabolism**—increased use of glucose (sugar) and liberation of fatty acids from adipose tissue

**Indications**

- Hypovolemic and septic shock
- Moderate to severe episodes of hypotension
- Control of superficial bleeding during surgical and dental procedures of the mouth, nose, throat, and skin
- Cardiac decompensation and arrest
- Allergic reactions (anaphylactic shock, angioneurotic edema)
- Temporary treatment of heart block
- Ventricular arrhythmias (under certain conditions)
- Respiratory distress (as bronchodilators)
- Nasal congestion and glaucoma (topical formulation)

**Adverse Reactions**

- Cardiac arrhythmias (bradycardia and tachycardia)
- Headache
- Nausea and vomiting
- Increased blood pressure (which may reach dangerously high levels)

**Contraindications**

Known hypersensitivity

- **Isoproterenol**: Tachyarrhythmias. Tachycardia, heart block caused by digitalis toxicity, ventricular arrhythmias, and angina pectoris.
- **Dopamine**: contraindicated in those with pheochromocytoma (adrenal gland tumor), unmanaged arrhythmias, and ventricular fibrillation.
- **Epinephrine**: contraindicated in patients with narrow-angle glaucoma and as a local anesthetic adjunct in fingers and toes.
- **Norepinephrine**: contraindicated in patients who are hypotensive from blood volume deficits.
- **Midodrine**: causes severe hypertension in the patient who is lying down (supine).

**Interactions**

- **Antidepressants**: Increased sympathomimetic effect
- **Oxytocin**: Increased risk of hypertension

**Herbal Considerations**

Ephedra (Ma Huang) and the many substances of the Ephedra genus have been used medicinally (e.g., E. sinica and E. intermedia). Ephedra (ephedrine) preparations have traditionally been used to relieve cold symptoms and improve respiratory function, and as an adjunct in weight loss. Large doses may cause a variety of adverse reactions, such as hypertension and irregular heart rate. The use of ephedra has shifted from relief of respiratory problems to an aid to weight loss and enhanced athletic performance. Before taking this herb, the patient should consult a primary health care provider. Ephedra should not be used with the cardiac glycosides, halothane, guanethidine, monoamine oxidase inhibitor (MAOI) antidepressants, or oxytocin or by patients taking St. John’s wort. The U.S. Food and Drug Administration (FDA) warns the public not to take ephedrine-containing dietary supplements. Stroke and heart attack have resulted from taking these products. Many producers of weight loss supplements are removing the ephedra component because of potential legal liability (DeRoude, 2003). (Ford 247)

**Nursing Management**

- Use an electronic infusion pump to administer these drugs.
- Do not mix dopamine with other drugs, especially sodium bicarbonate or other alkaline intravenous (IV) solutions. Check with the clinical pharmacist before adding a second drug to an IV solution containing this drug.
- Do not dilutenorepinephrine or dopamine IV solutions before administration. The primary health care provider orders the IV solution, the amount of drug added to the solution, and the initial rate of infusion.
- Blood pressure is monitored continuously from the beginning of therapy until the desired blood pressure is achieved, and until the patient is transferred to a less supervised unit.
- Adjust the rate of drug administration according to the patient’s blood pressure. The rate of administration of the IV solution is increased or decreased to maintain the patient’s blood pressure at the systolic pressure ordered by the primary health care provider.
- Readjustment of the rate of flow of the IV solution is often necessary. The frequency of adjustment depends on the patient’s response to the vasopressor.
- Inspect the needle site and surrounding tissues at frequent intervals for leakage (extravasation, infiltration) of the solution into the subcutaneous tissues surrounding the needle site. If leakage occurs, establish another IV line immediately, then discontinue the IV containing the vasopressor, and notify the primary health care provider. These drugs are particularly damaging when they leak into surrounding tissues. You should know the extravasation protocol and have orders signed by the primary health care provider to implement the protocol whenever these drugs are used.
- Never leave the patient receiving these drugs unattended. (Ford 249)

**Shock**

Monitoring the patient in shock requires your vigilance. The patient’s heart rate, blood pressure, and electrocardiogram are monitored continuously. Urine output is measured often (usually hourly), and accurate intake and output measurements are taken. (Ford 249)

<table>
<thead>
<tr>
<th>Generic</th>
<th>Trade</th>
<th>Use</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>dobutamine</td>
<td>N/A</td>
<td>Cardiac decompression due to depressed contractility caused by organic heart disease or cardiac surgical procedures</td>
<td>2.5–10 mcg/kg/min IV (up to 40 mcg/kg/min); titrate to patient’s hemodynamic and renal status</td>
</tr>
<tr>
<td>dopamine</td>
<td>N/A</td>
<td>Shock due to myocardial infarction, trauma, open heart surgery, renal failure, and chronic cardiac decompression in congestive heart failure</td>
<td>2–50 mcg/kg/min IV (infusion rate determined by patient’s response)</td>
</tr>
</tbody>
</table>

**Nursing in Practice**

Regardless of the actual numeric reading of the blood pressure, a progressive decrease in blood pressure is serious. Report any progressive decrease in blood pressure, a decrease in systolic blood pressure below 100 mm Hg, or any decrease of 20 mm Hg or more of the patient’s normal blood pressure.
PNS DRUGS: ALPHA ADRENERGIC BLOCKERS

HOW DO THEY WORK?

"Action"

Stimulation of α-adrenergic nerves results in vasoconstriction. If stimulation of α-adrenergic nerves is interrupted or blocked, the result is vasodilation.

Indications

❖ Hypertension caused by pheochromocytoma (a tumor of the adrenal gland that produces excessive amounts of epinephrine and norepinephrine)
❖ Hypertension during preoperative preparation
❖ They are also used to prevent or treat tissue damage caused by extravasation of dopamine.

Adverse reactions

❖ weakness, orthostatic hypotension
❖ cardiac arrhythmias, hypotension, and tachycardia.

Contraindications

❖ Hypersensitivity
❖ Coronary artery disease

Interactions

None listed.

Nursing management

❖ Do not stop taking the drug abruptly, except on the advice of the primary health 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 lightheadedness.
❖ Immediately report any signs of HF (weight gain, difficulty breathing, or edema of the extremities).
❖ Do not use any nonprescription drug (e.g., cold or flu preparations or nasal decongestants) unless you have discussed use of a specific drug with the primary health care provider.
❖ Inform dentists and other primary health care providers of therapy with this drug.
❖ Keep all primary health care provider appointments because close monitoring of therapy is essential.
❖ Check with a primary health care provider or clinical pharmacist to determine if the drug is to be taken with food or on an empty stomach. (Ford 259-260)

<table>
<thead>
<tr>
<th>Generic</th>
<th>Trade</th>
<th>Use</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phentolamine</td>
<td>Regitine</td>
<td>Diagnosis of pheochromocytoma, hypertensive episodes before and during surgery, prevention/treatment of dermal necrosis after IV administration of norepinephrine or dopamine</td>
<td>5 mg IV, IM Tissue necrosis: 5–10 mg in 10 mL saline solution infiltrated into affected area</td>
</tr>
</tbody>
</table>
**PNS DRUGS: β-ADRENERGIC BLOCKERS**

**HOW DO THEY WORK?**

**“Action”**

These drugs decrease the heart’s excitability, 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 used for cardiac purposes are esmolol (Brevibloc) and propranolol (Inderal). (Ford 256)

**INDICATIONS**

- Hypertension (first-choice drug for patients with stable angina)
- Cardiac arrhythmia (abnormal rhythm of the heart), such as ventricular or supraventricular tachycardia
- Migraine headaches
- Heart failure (HF)
- Angina pectoris
- Glaucoma (topical ophthalmic eye drops)

(Ford 256)

**CONTRAINDICATIONS**

These drugs are contraindicated in patients with an allergy to β blockers; in patients with sinus bradycardia, second- or third-degree heart block, or HF; and in those with asthma, emphysema, and hypotension. The drugs are used cautiously in patients with diabetes, thyrotoxicosis, or peptic ulcer. (Ford 256)

**INTERACTIONS**

- Antidepressants (monoamine oxidase inhibitors [MAOIs], selective serotonin reuptake inhibitors [SSRIs]): Increased effect of the β blocker, bradycardia
- Nonsteroidal anti-inflammatory drugs (NSAIDs), salicylates: Decreased effect of the β blocker
- Loop diuretics: Increased risk of hypotension
- Clonidine: Increased risk of paradoxical hypertensive effect
- Cimetidine: Increased serum level of the β blocker and higher risk of β blocker toxicity
- Lidocaine: Increased serum level of the β blocker and higher risk of β blocker toxicity

**CHRONIC CARE**

Hypertension research studies demonstrate better patient outcomes for African Americans when β blockers are used in combination with diuretics than other drugs alone to treat hypertension, such as angiotensin-converting enzyme (ACE) inhibitors (Ferdinand, 2007). (Ford 256)

**ADVERSE REACTIONS**

Cardiac reactions that affect the body in a generalized manner include orthostatic hypotension, bradycardia, dizziness, vertigo, and headache. Gastrointestinal (GI) reactions include hyperglycemia, nausea, vomiting, and diarrhea. Another bodily system reaction is bronchospasm (especially in those with a history of asthma). (Ford 256)

**NURSING MANAGEMENT**

- Do not stop taking the drug abruptly, except on the advice of the primary health 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 lightheadedness.
- Immediately report any signs of HF (weight gain, difficulty breathing, or edema of the extremities).
- Do not use any nonprescription drug (e.g., cold or flu preparations or nasal decongestants) unless you have discussed use of a specific drug with the primary health care provider.
- Inform dentists and other primary health care providers of therapy with this drug.
- Keep all primary health care provider appointments because close monitoring of therapy is essential.
- Check with a primary health care provider or clinical pharmacist to determine if the drug is to be taken with food or on an empty stomach. (Ford 259-260)

**Generic** | **Trade** | **Use** | **Dose**
---|---|---|---
acebutolol | Sectral | Hypertension, ventricular arrhythmias | Hypertension: 400 mg orally in 1–2 doses Arrhythmias: 400–1200 mg/day orally in divided doses
propranolol | Inderal | Cardiac arrhythmias, MI, angina, hypertension, migraine prophylaxis, hypertrophic subaortic stenosis, pheochromocytoma, essential tremor | Arrhythmias: 10–30 mg orally TID, QID Hypertension: 120–240 mg/day orally in divided doses Angina: 80–320 mg/day orally in divided doses Migraine: 160–240 mg/day orally in divided doses

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*Images and graphics are not transcribed.*
α/β-Adrenergic blocking drugs block the stimulation of both the α- and β-adrenergic receptors, resulting in peripheral vasodilation. The two drugs in this category are carvedilol (Coreg) and labetalol (Trandate). (Ford 256)

**Indications**

- **Carvedilol** is used to treat essential hypertension and in HF to reduce progression of the disease.
- **Labetalol** is used in the treatment of hypertension, either alone or in combination with another drug, such as a diuretic. (Ford 256)

**Adverse reactions**

General body system adverse reactions include fatigue, dizziness, hypotension, drowsiness, insomnia, weakness, diarrhea, dyspnea, chest pain, bradycardia, and skin rash. (Ford 256)

**Contraindications**

- hypersensitivity to the drugs
- bronchial asthma
- decompensated HF
- severe bradycardia

**Interactions**

- **Antidepressants (tricyclics and SSRIs):** Increased risk of tremors
- **Cimetidine:** Increased effect of the adrenergic blocker
- **Clonidine:** Increased effect of the clonidine
- **Digoxin:** Increased serum level of the digoxin and higher risk of digoxin toxicity (Ford 256)

**Nursing alert**

When administering a sympatholytic drug, such as propranolol (Inderal), take an apical pulse rate and blood pressure before giving the drug. If the pulse is below 60 beats/min, or if there is any irregularity in the patient’s heart rate or rhythm, or if systolic blood pressure is less than 90 mm Hg, withhold the drug and contact the primary health care provider. (Ford 258)

<table>
<thead>
<tr>
<th>Generic</th>
<th>Trade</th>
<th>Use</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>carvedilol</td>
<td>Coreg</td>
<td>Hypertension, HF, left ventricular dysfunction</td>
<td>6.25–25 mg orally BID</td>
</tr>
<tr>
<td>labetalol</td>
<td>Trandate</td>
<td>Hypertension</td>
<td>200–400 mg/day orally in divided doses IV; 20 mg over 2 min with blood pressure monitoring, may repeat</td>
</tr>
</tbody>
</table>
**HOW DO THEY WORK?**

**“Action”**

acts on the central nervous system (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. (Ford 256)

**INDICATIONS**
- Hypertension
- BPH

**ADVERSE REACTIONS**
- Dry mouth, drowsiness, sedation, anorexia, rash, malaise, and weakness are generalized reactions to antiadrenergic drugs that work on the CNS.
- Hypotension, weakness, lightheadedness, and bradycardia are adverse reactions associated with the administration of peripherally acting antiadrenergic drugs. (Ford 257)

**CONTRAINDICATIONS**
Centrally acting antiadrenergic drugs are contraindicated in active hepatic disease, in antidepressant therapy using MAOIs, and in patients with a history of hypersensitivity to these drugs. (Ford 257)

**INTERACTIONS**
- **Adrenergic drugs:** Increased risk of hypertension
- **Levodopa:** Decreased effect of the levodopa, hypotension
- **anesthetic agents:** Increased effect of the anesthetic
- **β blockers:** Increased risk of hypertension
- **Lithium:** Increased risk of lithium toxicity
- **Haloperidol:** Increased risk of psychotic behavior

**NURSING ALERT**
If a significant decrease in blood pressure (a drop of 20 mm Hg systolic or a systolic pressure below 90 mm Hg) occurs after a dose of an adrenergic blocking drug, withhold the next drug dose and notify the primary health care provider immediately. A dosage reduction or discontinuation of the drug may be necessary. Some adrenergic blocking drugs (e.g., 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. (Ford 259)

**NURSING MANAGEMENT**
- Do not stop taking the drug abruptly, except on the advice of the primary health 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 lightheadedness.
- Immediately report any signs of HF (weight gain, difficulty breathing, or edema of the extremities).
- Do not use any nonprescription drug (e.g., cold or flu preparations or nasal decongestants) unless you have discussed use of a specific drug with the primary health care provider.
- Keep all primary health care provider appointments because close monitoring of therapy is essential.
- Check with a primary health care provider or clinical pharmacist to determine if the drug is to be taken with food or on an empty stomach. (Ford 259-260)

<table>
<thead>
<tr>
<th>Generic</th>
<th>Trade</th>
<th>Use</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clonidine</td>
<td>Catapres, Catapres-TTS (transdermal)</td>
<td>Hypertension, severe pain in patients with cancer</td>
<td>100–600 mcg/day orally Transdermal: release rate 0.1–0.3 mg/24 hr</td>
</tr>
<tr>
<td>Methyldopa</td>
<td>N/A</td>
<td>Hypertension, hypertensive crisis</td>
<td>250 mg orally BID or TID; maintenance dose: 2 g/day; 250–500 mg q 6 hr IV</td>
</tr>
</tbody>
</table>
**PNS DRUGS: PERIPHERALLY ACTING ANTIADRENERGICS**

**HOW DO THEY WORK?**

**“ACTION”**

Inhibits the release of norepinephrine from certain adrenergic nerve endings in the peripheral nervous system. (Ford 256)

**CONTRAINDICATIONS**

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

**INDICATIONS**

- Hypertension
- BPH

**INTERACTIONS**

- Adrenergic drugs: Increased risk of hypertension
- Levodopa: Decreased effect of the levodopa, hypotension
- Anesthetic agents: Increased effect of the anesthetic
- β blockers: Increased risk of hypertension
- Lithium: Increased risk of lithium toxicity
- Haloperidol: Increased risk of psychotic behavior

**ADVERSE REACTIONS**

- Dry mouth, drowsiness, sedation, anorexia, rash, malaise, and weakness are generalized reactions to antiadrenergic drugs that work on the CNS.
- Hypotension, weakness, lightheadedness, and bradycardia are adverse reactions associated with the administration of peripherally acting antiadrenergic drugs. (Ford 257)

**NURSING MANAGEMENT**

- Do not stop taking the drug abruptly, except on the advice of the primary health 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 lightheadedness.
- Immediately report any signs of HF (weight gain, difficulty breathing, or edema of the extremities).
- Do not use any nonprescription drug (e.g., cold or flu preparations or nasal decongestants) unless you have discussed use of a specific drug with the primary health care provider.
- Inform dentists and other primary health care providers of therapy with this drug.
- Keep all primary health care provider appointments because close monitoring of therapy is essential.
- Check with a primary health care provider or clinical pharmacist to determine if the drug is to be taken with food or on an empty stomach. (Ford 259-260)

**EDUCATION**

Instruct patients to rise slowly from a sitting or lying position. Provide assistance for the patient getting out of 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 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. (Ford 259)

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**Generic** | **Trade** | **Use** | **Dose**
---|---|---|---
**doxazosin** | **Cardura** | **Hypertension, BPH** | Hypertension: 1–8 mg orally daily BPH: 1–16 mg orally daily
**prazosin** | **Minipress** | **Hypertension** | 1–20 mg orally daily in divided doses
PNS DRUGS: CHOLINERGICS

HOW DO THEY WORK?

“ACTION”

❖ Cholinergic drugs that act like the neurotransmitter ACh are called direct-acting cholinergics. Cholinergic drugs causes contraction of the bladder smooth muscles and passage of urine. (Ford 266)
❖ Cholinergic drugs that prolong the activity of ACh by inhibiting the release of AChE are called indirect-acting cholinergics or anticholinesterase muscle stimulants.

INDICATIONS

❖ Urinary retention
❖ Myasthenia gravis

ADVERSE REACTIONS

❖ Nausea, diarrhea, abdominal cramping
❖ Salivation
❖ Flushing of the skin
❖ Cardiac arrhythmias and muscle weakness

CONTRAINDICATIONS

Hypersensitivity to the drugs, asthma, peptic ulcer disease, coronary artery disease, and hyperthyroidism. Bethanechol is contraindicated in those with mechanical obstruction of the GI or genitourinary tracts. Patients with secondary glaucoma, iritis, corneal abrasion, or any acute inflammatory disease of the eye should not use the ophthalmic cholinergic preparations. (Ford 267)

INTERACTIONS

❖ Aminoglycoside: Anti-infective agent Increased neuromuscular blocking effect
❖ Corticosteroids: Decreased effect of the cholinergic drug

NURSING ALERT

Cholinergic crisis (cholinergic drug toxicity) symptoms include severe abdominal cramping, diarrhea, excessive salivation, muscle weakness, rigidity and spasm, and clenching of the jaw. Patients exhibiting these symptoms require immediate medical treatment. In the case of drug overdose, an antidote such as atropine (0.4 to 0.6 mg intravenously [IV]) is administered. (Ford 267)

NURSING MANAGEMENT

Because of the need to make frequent dosage adjustments, observe the patient closely for symptoms of drug overdose or underdose. Signs of drug overdose include muscle rigidity and spasm, salivation, and clenching of the jaw. Signs of drug underdosage are signs of the disease itself, namely, rapid fatigability of the muscles, drooping of the eyelids, and difficulty breathing. If symptoms of drug overdose or underdose develop, contact the primary health care provider immediately.

Generic | Trade | Use | Dose
------- |-------|-----|-----
bethanechol | Duvoid, Urecholine | Acute non obstructive urinary retention, neurogenic atony of urinary bladder with urinary retention | 10–50 mg orally BID to QID; 2.5–5 mg subcutaneously TID to QID
ambenonium | Mytelase | Myasthenia gravis | 5–75 mg orally TID, QID
Cholinergic blocking drugs inhibit the activity of ACh at the parasympathetic nerve synapse. When the activity of ACh is inhibited, impulses traveling along the parasympathetic nerve cannot pass from the nerve ending to the effector organ or structure.

**Indications**
- Pylorospasm and peptic ulcer
- Ureteral or biliary colic and bladder overactivity
- Vagal nerve–induced bradycardia
- Parkinsonism

**Adverse Reactions**
- Dry mouth, nausea, vomiting
- Difficulty in swallowing, heartburn
- Constipation
- Headache, flushing, nervousness
- Drowsiness, weakness, insomnia
- Nasal congestion, fever
- Blurred vision
- Mydriasis (dilation of the pupil)
- Photophobia
- Cycloplegia (paralysis of accommodation or inability to focus the eye)
- Increased ocular tension
- Urinary hesitancy and retention
- Dysuria
- Palpitations
- Bradycardia (after low doses of atropine)
- Tachycardia (after higher doses of atropine)
- Mydriasis (dilation of the pupil)
- Decreased sweat production
- Urticaria
- Rash

**Contraindications**
Cholinergic blocking drugs are contraindicated in patients with known hypersensitivity to the drugs or glaucoma. Other patients for whom cholinergic blocking drugs are contraindicated are those with myasthenia gravis, tachyarrhythmias, myocardial infarction, and heart failure (unless bradycardia is present). (Ford 273)

**Interactions**
- Antibiotics/antifungals: Decreased effectiveness of anti-infective drug
- Meperidine, flurazepam, phenothiazines: Increased effect of the cholinergic blocker
- Tricyclic antidepressants: Increased effect of the cholinergic blocker
- Haloperidol: Decreased effectiveness of the antipsychotic drug
- Digoxin: Increased serum levels of

**Nursing Management**
Cholinergic blocking drugs are usually not included in the preoperative drugs of patients older than 60 years because of the effects of these drugs on the eye and the central nervous system. (Ford 274)

Perform frequent mouth care, including brushing, rinsing, and flossing.
- Keep a glass or sports bottle filled with fluid on hand at all times.
- Sip small amounts of cool water or fluids throughout the day and with meals.
- Try one of the flavor additives or a slice of lemon, lime, or cucumber in the water.
- Take a few sips of water before taking any oral drugs.
- Suck on ice chips or frozen ices, such as popsicles.
- Chew gum, preferably sugarless.
- Suck on sugar-free hard candies.
- Avoid alcohol-based mouthwashes. (Ford 274)

**Generic** | **Trade** | **Use** | **Dose**
--- | --- | --- | ---
Atropine | AtroPen | Pylorospasm, reduction of bronchial and oral secretions, excessive vagal-induced bradycardia, ureteral and biliary colic | 0.4–0.6 mg orally, IM, subcut, IV
Belladonna | N/A | Adjunctive therapy for peptic ulcer, digestive disorders, diverticulitis, pancreatitis, diarrhea | 0.25–0.5 mg orally TID