

# Dextroamphetamine-Amphetamine

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## Continuing Education Activity

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The dextroamphetamine-amphetamine combination is a central nervous system stimulant classified as a Schedule II drug by the Drug Enforcement Administration (DEA) and the US Food and Drug Administration (FDA) due to its high potential for abuse. Both immediate-release and sustained-release amphetamine medications are FDA-approved for treating attention-deficit hyperactivity disorder (ADHD) and narcolepsy in adult and pediatric populations. The drug works by increasing dopamine and norepinephrine levels through catecholamine release and reuptake inhibition. Off-label uses of dextroamphetamine-amphetamine include the management of cerebrovascular accidents.

This activity reviews the indications, mechanism of action, adverse event profile, administration, pharmacokinetics, and clinical monitoring of dextroamphetamine-amphetamine. This activity provides healthcare professionals with essential knowledge and tools to effectively tailor treatments to individual patient needs. In addition, this activity emphasizes the importance of collaboration among the interprofessional healthcare team in delivering evidence-based care to optimize patient outcomes in dextroamphetamine-amphetamine therapy.

### Objectives:

- Identify the indications, contraindications, and potential adverse effects of dextroamphetamine-amphetamine, including risks for misuse and abuse.
- Implement precise dosing strategies and monitoring protocols to optimize therapeutic outcomes and minimize adverse effects.
- Select appropriate pharmacological interventions for managing adverse effects, including hypertension, tachycardia, and anxiety.
- Collaborate with the interprofessional healthcare team to tailor dextroamphetamine-amphetamine treatment to individual patient needs.

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## Indications

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The dextroamphetamine-amphetamine combination is a central nervous system (CNS) stimulant. Amphetamine consists of various amphetamine salts, whereas dextroamphetamine is the dextro (right-handed) enantiomer of amphetamine. The Drug Enforcement Administration (DEA) and the

US Food and Drug Administration (FDA) classify these medications as Schedule II drugs due to their high potential for abuse in the United States.

According to data published by the American Psychiatric Association, 3% to 7% of school-aged children and 4% of adults in the United States are diagnosed with attention-deficit hyperactivity disorder (ADHD). Both immediate-release and sustained-release amphetamine medications are used to treat ADHD and narcolepsy in adult and pediatric populations.

### **FDA-Approved Indications**

Dextroamphetamine is FDA-approved for ADHD in pediatric patients aged 3 to 16 (immediate-release tablet and oral solution) and 6 to 16 (extended-release tablet). Transdermal patch is approved for patients aged 6 or older. Amphetamines, in combination with other remedial measures such as psychological, educational, and social interventions, are prescribed to manage symptoms such as distractibility, short attention span, hyperactivity, and impulsivity. In the pediatric population, the immediate-release tablet is recommended for patients aged 3 or older, whereas the extended-release capsule is approved for patients aged 6 or older.

**Classification:** Dextroamphetamine-amphetamine is classified differently for adults and pediatric populations based on its potential for abuse and dependence.

- Adult: Category B and class IIb (high potential for abuse and dependence, accepted medical use, and the potential for severe addiction).
- Pediatric: Category B and class IIb.

Dextroamphetamine is also FDA-approved for the treatment of narcolepsy; however, the transdermal patch is not approved for this indication. The American Academy of Sleep Medicine (AASM) recommends that clinicians consider dextroamphetamine for managing daytime sleepiness in adults with narcolepsy (conditional recommendation). However, modafinil and pitolisant are preferred according to the AASM.

**Classification:** Dextroamphetamine-amphetamine is classified as category B, class IIb for both adults and pediatric populations, indicating its potential for abuse and approved medical use.

- Adult: Category B and class IIb.
- Pediatric: Category B and class IIb.

### **Off-Label Uses**

Dextroamphetamine-amphetamine has been used historically in the treatment of cerebrovascular accidents. Research by Walker-Batson et al and Crisostomo et al [[Annals of Neurology](#)] showed that amphetamines improved motor function in patients with ischemic stroke compared to those receiving physical therapy alone. However, a subsequent study reported conflicting results, with

no significant difference in Fugl-Meyer motor scale scores between the amphetamine and placebo groups. Recent clinical studies investigating dextroamphetamine for poststroke recovery have shown no success.

While the mechanism of dextroamphetamine suggests potential benefits for stimulating neural recovery, concerns regarding its efficacy have led to hesitancy in its use for stroke management. According to the American Heart Association/American Stroke Association's guidelines for primary stroke prevention, amphetamine use increases the risk of stroke. In addition, dextroamphetamine-amphetamine is used off-label by college students for memory enhancement, improved test-taking ability, and study marathons.

## Mechanism of Action

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Amphetamines are non-catecholamines, sympathomimetic amines with CNS stimulant activity. Amphetamines increase dopamine and norepinephrine levels in the synaptic space by promoting the release of catecholamines from the presynaptic nerve terminals. Additionally, they block the reuptake of norepinephrine and dopamine into the presynaptic neuron by competitive inhibition. Released norepinephrine affects both alpha-adrenergic receptor sites and beta-adrenergic receptor sites. Stimulation of beta-adrenergic receptor sites by these medications increases heart rate, stroke volume, and blood flow to skeletal muscles. Please see StatPearls' companion resource, "[Prescription of Controlled Substances: Benefits and Risks](#)," for more information.

Alpha-adrenergic stimulation causes vasoconstriction and increases total peripheral resistance, resulting in elevated systolic and diastolic blood pressure, along with a weak bronchodilator and respiratory stimulant effect. However, the mechanism behind amphetamine's mental and behavioral effects in children is not fully understood. Both immediate-release tablets and extended-release capsules contain a 3:1 ratio of d-amphetamine and l-amphetamine salts.

## Pharmacokinetics

**Absorption:** The time to reach peak plasma concentration (Tmax) is 3 hours for immediate-release tablets and 7 hours for extended-release tablets. The duration of action for the immediate-release tablet is 4 to 6 hours, whereas the extended-release tablet lasts 8 to 12 hours.

**Distribution:** The volume of distribution of amphetamine is 4 L/kg, and its plasma protein binding is less than 20%.

**Metabolism:** Amphetamine is oxidized to form 4-hydroxyamphetamine, alpha-hydroxyamphetamine, or norephedrine. Both norephedrine and 4-hydroxyamphetamine are active metabolites and are further metabolized to form 4-hydroxy-norephedrine. The deamination of alpha-hydroxyamphetamine leads to the formation of phenylacetone, which is then metabolized to benzoic acid, its glucuronide conjugate, and hippuric acid, the glycine conjugate. CYP2D6 is

crucial in the metabolism of hydroxyamphetamine. Due to the genetic polymorphism of CYP2D6, variations in amphetamine metabolism may occur. Additionally, amphetamine inhibits monoamine oxidase (MAO), and both CYP1A2 and CYP3A4 contribute to its metabolism.

**Elimination:** Amphetamine is primarily excreted in the urine as metabolites, including alpha-hydroxy-amphetamine, with approximately 30% to 40% of the dose recovered as unchanged amphetamine. Due to its pKa of 9.9, the urinary elimination of amphetamine is influenced by urine pH and flow rates. An alkaline urine pH reduces ionization, which leads to decreased renal elimination.

In contrast, acidic pH and increased urine flow rates enhance renal clearance, surpassing glomerular filtration rates (GFR), which suggests that active tubular secretion plays a significant role in excretion. The half-life of the D-enantiomer is 9 hours in children aged 6 to 12, whereas the L-enantiomer has a half-life of 11 hours. In adolescents aged 13 to 17, the D-enantiomer has a half-life of 11 hours, and the L-enantiomer ranges from 13 to 14 hours. In adults, the D-enantiomer has a half-life of 10 hours, whereas the L-enantiomer has a half-life of 13 hours.

## Administration

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### Available Dosage Forms

Dextroamphetamine-amphetamine is administered orally and is available as immediate-release tablets or extended-release capsules.

### Available Strengths

- Extended-release capsules: These are available in the strengths of 5 mg, 10 mg, 15 mg, 20 mg, 25 mg, and 30 mg.
- Immediate-release tablets: These are available in the strengths of 5 mg, 7.5 mg, 10 mg, 12.5 mg, 15 mg, 20 mg, and 30 mg.

Extended-release capsules should be swallowed whole without chewing. Alternatively, the entire capsule can be sprinkled on food and consumed immediately. The dose of a single capsule should not be divided. Patients should avoid taking doses in the afternoon or late evening to minimize the risk of insomnia. The medication should be stored at a temperature between 20 °C and 25 °C (68-77 °F).

### FDA-Approved Dosages for the Management of Attention-Deficit Hyperactivity Disorder

**Pediatric dosages:** Dextroamphetamine-amphetamine dosing varies based on age, with specific considerations for safety and efficacy.

- Individuals aged 3 or younger: Dextroamphetamine-amphetamine is not recommended for this age group.

- Individuals aged 3 to 5: Immediate-release tablets are used for children in this age group. Clinicians should assess the potential for misuse by the patient or parents before prescribing these short-acting tablets.
  - The recommended initial dose is 2.5 mg of an immediate-release tablet once daily in the morning, taken upon awakening. Subsequent doses may be administered at 4- to 6-hour intervals.
  - The daily dose may be increased by 2.5 mg at weekly intervals until an optimal response is achieved.
  - The total daily dosage ranges from 2.5 to 40 mg, divided into 1 to 3 equally divided doses.
- Individuals aged 6 or older: Both immediate-release tablets and extended-release capsules are recommended for this age group.

**Immediate-release tablets:** The recommended initial dosage is 5 mg once or twice daily, with the first dose taken upon awakening. Subsequent doses can be given at 4- to 6-hour intervals. The daily dosage may be increased by 5 mg weekly until an optimal response is achieved. The total daily dose ranges from 5 to 40 mg, administered in 1 to 3 equally divided doses.

**Extended-release capsules:** The recommended initial dosage is 5 to 10 mg once daily in the morning. The daily dose may be increased by 5 to 10 mg weekly until an optimal response is achieved. The maximum recommended daily dose is 30 mg.

**Adolescent dosages:** Both immediate-release tablets and extended-release capsules of dextroamphetamine-amphetamine are suitable for this age group.

**Immediate-release tablets:** The recommended initial dosage is 5 mg once or twice daily, with the first dose taken upon awakening. Subsequent doses may be administered at 4- to 6-hour intervals. The daily dose may be increased by 5 mg weekly until an optimal response is achieved. The total daily dosage ranges from 5 to 40 mg, divided equally into 1 to 3 doses.

**Extended-release capsules:** The recommended initial dosage is 10 mg once daily in the morning. The dose can be increased to 20 mg daily after 1 week if necessary. Adequate evidence does not support that higher doses offer additional benefits.

**Adult dosages:** Both immediate-release tablets and extended-release capsules of dextroamphetamine-amphetamine are suitable for adults.

**Immediate-release tablet:** The initial dose is 5 mg, administered once or twice daily. The daily dosage can be increased by 5 mg weekly until an optimal response is achieved. The typical dosage range is 5 to 40 mg daily, divided equally into 1 to 3 doses. Subsequent doses may be administered at 4- to 6-hour intervals.

Extended-release capsule: The initial dose is 20 mg once daily in the morning. Available evidence indicates that higher doses (up to 60 mg/d) do not provide additional benefits.

## FDA-Approved Dosages for the Management of Narcolepsy

**Pediatric dosages (age 6 or older):** The initial dose is 5 mg of an immediate-release tablet taken daily. The daily dose should be increased by 5 mg weekly until an optimal response is achieved. The usual dosage range is 5 to 60 mg/d, administered in 1 to 3 equally divided doses.

**Adult dosages:** The initial dose is 10 mg of an immediate-release tablet taken once daily in the morning. The daily dose should be increased by 10 mg weekly until an optimal response is achieved. The usual dosage range is 5 to 60 mg/d, administered in 1 to 3 equally divided doses.

## Specific Patient Populations

**Hepatic impairment:** The manufacturer's labeling does not specify any dosage adjustments for patients with hepatic impairment. Therefore, it is advisable to use the medication with caution in this population.

**Renal impairment:** The manufacturer's labeling for oral formulations does not provide specific dosage adjustments for patients with renal impairment; therefore, caution is advised when prescribing the medicine. For patients with a GFR between 15 and more than 30 mL/min/1.73 m<sup>2</sup>, the maximum dose of the transdermal patch is 13.5 mg per 9 hours. For individuals with a GFR of less than 15 mL/min/1.73 m<sup>2</sup>, the maximum dose is 9 mg per 9 hours.

**Pregnancy considerations:** Reports indicate an increased risk of premature delivery and low birth weight in infants born to mothers with amphetamine dependence, as amphetamine crosses the placenta. Cases have been reported of biliary atresia in infants exposed to amphetamine in utero during the second and third trimesters. Healthcare providers should carefully assess the potential risks and benefits before prescribing amphetamines during pregnancy and breastfeeding. Amphetamines should only be used during pregnancy if the potential maternal benefit outweighs the potential fetal risk.

Before 2015, amphetamines were classified as FDA Pregnancy Category C drugs; therefore, a comprehensive risk-benefit analysis is recommended. Amphetamines are not typically associated with major congenital malformations, including cardiac malformations or significant adverse obstetrical or developmental outcomes. However, there is an increased risk of gastroschisis and preeclampsia. Additionally, there is a risk of preterm birth if stimulant use continues during the second half of pregnancy.

**Breastfeeding considerations:** Amphetamines should not be prescribed to nursing women, as they are excreted in human breast milk. Physicians should consider alternative medications or advise patients to discontinue breastfeeding. A study involving a nursing mother diagnosed with

narcolepsy, who was receiving a daily dose of 20 mg of amphetamine, found significantly elevated levels of amphetamine in breast milk compared to maternal plasma.

Studies have shown that amphetamines were 3 and 7 times higher in breast milk than in maternal plasma on the 10th and 42nd days after delivery, respectively. Measurable amounts of amphetamine were also detected in the infant's urine. Additionally, high doses of amphetamines may impact milk production. The American Academy of Pediatrics (AAP) further states that breastfeeding is not advisable when the mother is receiving amphetamines.

**Pediatric patients:** The AAP recommends obtaining a family history of sudden death, cardiovascular symptoms, hypertrophic cardiomyopathy, Wolff-Parkinson-White syndrome, and long QT syndrome before initiating stimulant medication therapy in pediatric patients. If any risk factors are identified, clinicians should conduct further evaluations to assess and address safety concerns regarding stimulant medications in children or adolescents. The AAP classifies amphetamines as drugs with abuse potential. Clinicians should consider prescribing non-stimulant medications, such as atomoxetine, extended-release clonidine, or extended-release guanfacine, which have a lower potential for misuse or abuse.

**Older patients:** In older patients, dextroamphetamine-amphetamine should be used with caution, starting at the lower end of the dosage range.

## Adverse Effects

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### Common Adverse Effects

- Cardiovascular: Increased systolic arterial pressure
- Neurological: Headache and insomnia
- Endocrine or metabolic: Weight loss
- Gastrointestinal: Dry mouth, decrease in appetite, weight loss, abdominal pain, nausea, and diarrhea
- Psychiatric: Feeling nervous and mood swings
- Transdermal: Dermal discomfort [\[18\]](#)

### Severe Adverse Effects

- Cardiovascular: Cardiomyopathy, myocardial infarction, peripheral vascular disease, Raynaud phenomenon, and sudden cardiac death
- Neurological: Cerebrovascular accident and seizures [\[19\]](#)
- Dermatological: Stevens-Johnson syndrome and toxic epidermal necrolysis [\[20\]](#)

- Immunological: Hypersensitivity reactions
- Psychiatric: New or worsening psychotic or manic symptoms, behavioral changes, or emotional lability [\[21\]](#)[\[22\]](#)

## Drug-Drug Interactions

Monoamine oxidase inhibitors: The literature strongly suggests that the concurrent use of amphetamines and MAO inhibitors (MAOIs) is contraindicated, as it may lead to a hypertensive crisis.

Thiazide diuretics: Although limited documentation is available, pharmacological considerations suggest a potential interaction between amphetamines and thiazide diuretics. This interaction may be life-threatening, as it can lead to increased amphetamine exposure.

CYP2D6 inhibitors: The combination of dextroamphetamine and amphetamine with CYP2D6 inhibitors (such as fluoxetine, paroxetine, and bupropion) may increase dextroamphetamine levels and the risk of serotonin syndrome. Treatment should begin with a lower dose, with careful monitoring for symptoms, particularly during initiation or dosage adjustments. If serotonin syndrome develops, both the stimulant and the CYP2D6 inhibitor should be discontinued.

Serotonergic agents: The concurrent use of amphetamine with serotonergic agents that inhibit CYP2D6 may increase amphetamine exposure and elevate the risk of serotonin syndrome. [\[23\]](#)

Ascorbic acid: Concurrent use of ascorbic acid and amphetamines may reduce the efficacy of amphetamines in patients. [\[24\]](#)[\[25\]](#)[\[15\]](#)

Tricyclic antidepressants: Tricyclic antidepressants may enhance the effects of amphetamines, increasing the risk of cardiovascular and CNS adverse effects. Regular monitoring is recommended, with dosage adjustments or alternative treatments considered based on patient response.

## Drug-Laboratory Interactions

Steroid interference: Amphetamines can elevate plasma corticosteroid levels, typically peaking in the evening. They may also interfere with urinary steroid measurements.

Drug screening: Amphetamines can cause false-positive results in drug screenings, particularly in patients using therapeutic bupropion. [\[26\]](#) The American Society of Addiction Medicine (ASAM) advises caution when interpreting amphetamine immunoassays due to recognized limitations in specificity. [\[27\]](#)

## Contraindications

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Amphetamines are contraindicated in individuals with the following conditions:

- Hypersensitivity or idiosyncrasy to amphetamine or other product components
- Hypertensive crisis, which can occur with concomitant use of the drug or use within 14 days of MAOI administration, including linezolid or intravenous methylene blues
- Advanced arteriosclerosis
- Symptomatic cardiovascular disease
- Agitated states
- History of drug abuse
- Hyperthyroidism
- Moderate-to-severe hypertension
- Glaucoma [\[28\]](#)[\[29\]](#)

## Box Warnings

**Abuse, misuse, and diversion:** Amphetamines are classified as Schedule II controlled substances by the DEA, indicating a high potential for misuse and dependence. Prolonged administration should be avoided, as it may lead to drug dependence. Special attention should be given to the possibility of individuals obtaining amphetamines for nontherapeutic use. The drug should not be distributed to others, and healthcare professionals should prescribe or dispense the medication carefully.

The risk of abuse should be assessed before prescribing amphetamines, and patients should be monitored for signs of misuse and dependence during therapy. Clinicians should exercise caution when prescribing this drug to individuals with a history of alcohol or drug use disorders. According to the ASAM and the American Academy of Addiction Psychiatry (AAAP) guidelines, prescription psychostimulants may help reduce cravings and amphetamine-type stimulant use in individuals with stimulant use disorder.

## Warning and Precautions

Sudden death is a major concern associated with CNS stimulant treatment. Misuse, or even standard doses of amphetamine, in children and adolescents with structural cardiac abnormalities or other serious heart conditions may lead to sudden death and severe cardiovascular adverse

events. Amphetamines should be avoided in patients with known structural cardiac abnormalities, cardiomyopathy, heart rhythm abnormalities, coronary artery disease, or other significant cardiac issues that could elevate the risk of sudden death.

Evaluating cardiovascular status in patients before initiating stimulant medication is strongly recommended. A thorough history and physical examination, including assessment of potential risk factors such as a family history of sudden death or ventricular arrhythmia, should be conducted to evaluate for cardiac disease. Further cardiac evaluation with electrocardiogram (ECG) and echocardiogram should be performed if findings suggest the presence of cardiac disease. A case report describes ST-elevation myocardial infarction (STEMI) due to the ingestion of amphetamine and smoking.

**Neuropsychiatric adverse effects:** Caution is necessary when prescribing stimulants for ADHD to patients with comorbid conditions such as preexisting psychosis and bipolar disorders, as these conditions may worsen behavioral disturbances and thought disorders. A detailed psychiatric history, including a family history of suicide, bipolar disorder, and depression, should be considered in these patients to evaluate the risk of bipolar disorder.

**Coronary or carotid artery dissection:** An adverse event analysis from the FDA Adverse Event Reporting System (FAERS) indicates that amphetamine is associated with coronary artery dissection. A case report describes a diet pill containing amphetamine as an ingredient for weight loss, in which the patient was diagnosed with dissection of the internal carotid and vertebral arteries.

## Monitoring

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Monitoring is essential to assess the effectiveness and safety of amphetamine therapy, as mentioned below.

- Vital signs, including blood pressure and heart rate, should be regularly monitored.[\[35\]](#)[\[36\]](#)
- Improvement in mental and behavioral symptoms in patients diagnosed with ADHD should be assessed. The long-term usefulness of the drug should be reevaluated by temporarily withdrawing therapy.
- The frequency of narcoleptic attacks should be monitored for any decrease.
- Cardiovascular status should be evaluated before and during treatment. Any patient with symptoms indicative of a cardiac condition, such as exertional chest pain, palpitations, near-syncope, or syncope, should undergo further evaluation.
- ADHD patients should be assessed for risk factors of bipolar disorder before initiating treatment.

- Pediatric patients should be monitored for new-onset or worsening aggressive behavior after initiating treatment.
- Growth should be assessed regularly during treatment.
- Signs of peripheral vasculopathy, including Raynaud phenomenon, tics, and Tourette syndrome, should be evaluated before and throughout treatment.[\[37\]](#)[\[38\]](#)[\[39\]](#)
- Misuse and abuse should be monitored using a prescription drug monitoring program.[\[40\]](#)

## Toxicity

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### Signs and Symptoms of Overdose

Methamphetamine abuse has become an epidemic in recent years, raising significant concerns. Increased rates of depression, suicidal ideation, and suicide attempts are more commonly observed in adolescents abusing methamphetamine. The reported lethal dose for the adult population is 20 to 25 mg/kg, although the dose-response varies among individuals. Chronic amphetamine abusers may develop a tolerance to doses as high as 15,000 mg/d without experiencing lethal effects.

The mechanism of toxicity is primarily due to excessive extracellular dopamine, norepinephrine, and serotonin. The primary clinical manifestations involve prominent neurological and cardiovascular effects, while secondary complications may include renal, muscular, pulmonary, and gastrointestinal issues. Case reports have highlighted Takotsubo cardiomyopathy (TTC), also known as stress-induced cardiomyopathy, as a potential consequence of amphetamine overdose.

In one case, a patient arrived at the emergency department after ingesting 30 amphetamine salt tablets, exhibiting symptoms of chest pain and shortness of breath. Upon initial examination, the patient had elevated cardiac enzymes, an unremarkable ECG, and an ejection fraction of 25% to 30% with severe hypokinesis. However, 24 hours later, the symptoms had resolved, and a repeat echocardiogram performed 3 days later revealed an ejection fraction of 60% with no regional wall motion abnormalities.

Hyperactivity, hyperthermia, tachycardia, tachypnea, mydriasis, tremors, seizures, and altered mental status are among the most common signs and symptoms of amphetamine intoxication. Diagnosis can be confirmed by detecting amphetamines in stomach contents or vomitus or through a positive urine toxicology screen for illicit drugs. False-positive amphetamine screens may occur following the intake of medications such as trazodone or bupropion.

### Management of Overdose

No antidote exists for amphetamine toxicity; however, activated charcoal can serve as an emergency treatment. In patients who can safely ingest, it is recommended to administer activated charcoal, 1 to 2 g/kg up to 100 g by mouth, if ingestion occurs within the past hour.

Amphetamine-related toxicity requires management by addressing life-threatening CNS and cardiovascular symptoms in a controlled, quiet environment. Supportive care in the hospital includes monitoring the airway, breathing, and circulation. Agitation and seizures can be controlled with benzodiazepines, phenothiazines, pentobarbital, or propofol. A beta-blocker, such as propranolol, may be used to manage cardiac tachyarrhythmias. Intravenous nitroprusside (starting at 0.5-1 mcg/kg/min, titrated as needed) should be considered for severe hypertension. Intravenous fluids are essential for countering hyperthermia, maintaining renal function, and promoting the elimination of amphetamine and its analogs.

In cases of severe agitation, clinicians should consider aggressive treatment to prevent complications such as malignant hypertension, rhabdomyolysis, hyperthermia, and seizures. Evidence supports the use of large doses of benzodiazepines to manage amphetamine overdose-related psychosis and agitation. When agitation, delirium, and movement disorders are unresponsive to benzodiazepines, second-line therapies may include antipsychotics such as ziprasidone or haloperidol, central alpha-adrenoreceptor agonists such as dexmedetomidine, or propofol. In severe cases, neuromuscular paralysis, intubation, and active cooling measures may be necessary.

Physicians should order an ECG and consider telemetry monitoring in patients with tachycardia. Intravenous fluids and sedation should be used to control cardiac symptoms. For severe hypertension, intravenous nitroprusside may be considered. The management of rhabdomyolysis includes initiating 0.9% normal saline for aggressive hydration and monitoring creatine kinase, electrolytes, and creatinine levels.

A systematic review indicates that the management of amphetamine-related derivatives and analogs (ARDA) overdose centers on treating agitation, psychosis, and hyperadrenergic symptoms. Effective pharmacologic treatments include antipsychotics, benzodiazepines, beta-blockers, dexmedetomidine, and alpha-blockers.

## **Enhancing Healthcare Team Outcomes**

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All interprofessional healthcare team members should be aware of the potential complications associated with amphetamine-like agents. This healthcare team includes clinicians, specialists, advanced practice providers, nurses, and pharmacists. These medications should not be prescribed indiscriminately, and patients require close monitoring to prevent misuse.

Psychiatrists prescribe stimulant medications such as amphetamines for ADHD while monitoring for potential misuse. Addiction medicine specialists address amphetamine use disorder through behavioral therapy and pharmacotherapy to manage cravings and withdrawal. Neurologists and sleep medicine specialists prescribe amphetamines for narcolepsy in appropriate clinical settings. Emergency medicine physicians manage acute amphetamine toxicity, addressing symptoms such as agitation, hyperthermia, and cardiovascular instability.

A comprehensive history, physical examination, and cardiovascular evaluation should be conducted before initiating stimulant medication, as serious cardiac conditions can increase the risk of sudden death. The risk of abuse and dependence should be evaluated and monitored both before prescribing amphetamines and during therapy. Physicians should avoid prescribing the immediate-release (short-acting) form if there is a suspicion of potential misuse by the patient or their parents. The prescribing physician should advise the patient to report any symptoms of tachycardia, hypertension, angina, peripheral vasculopathy, or Raynaud phenomenon.

Patients should also receive education on the most common adverse effects of the medication. Most cases of amphetamine-related toxicity can be safely managed with supportive care, including monitoring the airway, breathing, and circulation, as well as controlling agitation with benzodiazepines. Effective interprofessional care coordination among clinicians, pharmacists, and nurses plays a crucial role in improving patient outcomes and reducing the risk of misuse associated with amphetamine-like agents.

## Review Questions

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