

Acute Management of Drug Overdose in Adolescents

[See online here](#)

Patients with drug overdose or substance abuse present as unconscious or hyperstimulated, or with psychotic features. Acute management includes basic life support protocol, sedation, as well as symptomatic and supportive treatment. Antidotes should be given if available. Oral drug overdose requires GI decontamination using activated charcoal and gastric lavage. Incidents of drug abuse can be decreased through parental monitoring and supportive family relationships.



Overview

Drug overdose is the **most common cause of acute poisoning worldwide.**

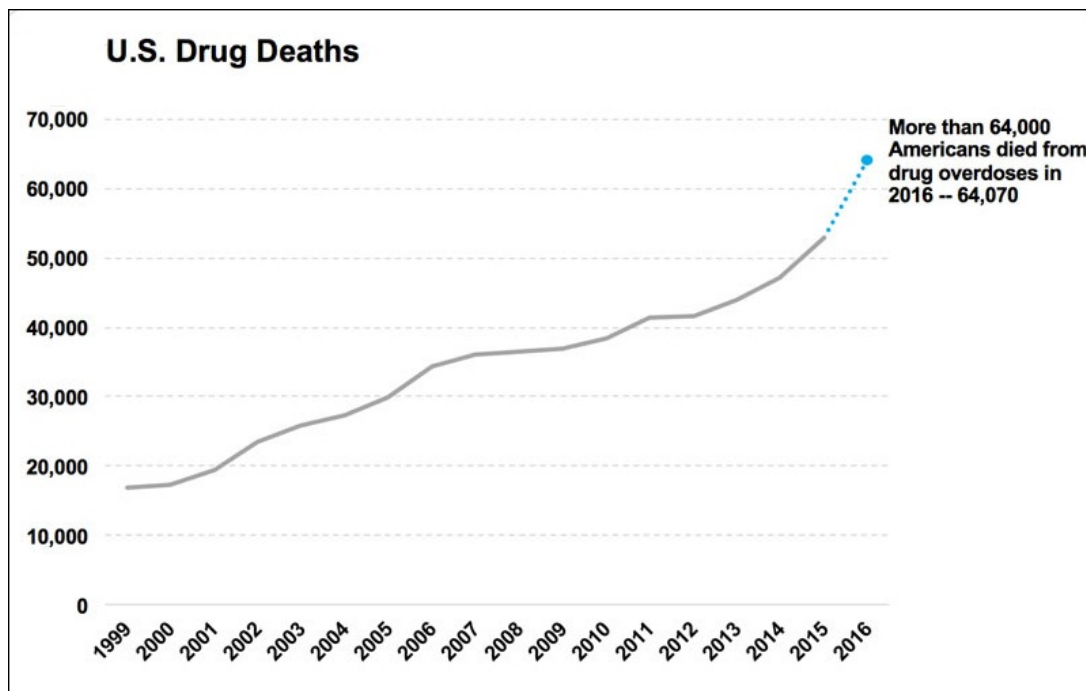


Image: Total U.S. Drug Deaths* - More than 64,000 Americans died from drug overdoses in 2016, including illicit drugs and prescription opioids-nearly double in a decade. By National Institute on Drug Abuse (NIDA), License: Public Domain

Acute management of drug overdose involves basic life support protocols. An [ABC \(Airway, Breathing, and Circulation\) approach](#) should be initiated. **Supportive and symptomatic care is the main treatment modality.** GI decontamination and pharmacological interventions are then used to reverse the side effects of drug overdose.

History, examination, and investigations are conducted alongside a [resuscitation approach](#). There is a difference in the drug-related vocabulary of health practitioners and drug abusers. It is, therefore, important for a healthcare provider to have an idea of locally used drug names.

History of Drug Overdose

History is indispensable in diagnosis and appropriate management. **The patient may not be able to provide an accurate history;** therefore, a detailed history must be sought from the caregivers or persons at the scene.

It is important to ask specifically about drug history - the type and quantity of the drug used, the time elapsed, as well as the route of administration. A past history of psychiatric illness and suicide is also important.

Interview questions

1. Weight loss?
2. Mood swings?
3. Problems with sleep?
4. Drops in academic performance? School truancy? Suspensions?
5. **CRAFT** screening tool

CRAFT screening tool

C	Have you ever ridden in a CAR driven by someone including yourself who was 'high' or had been using alcohol or drugs?
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R	Do you ever use alcohol or drugs to RELAX , feel better about yourself, or fit in?
A	Do you ever use alcohol or drugs while you are by yourself (ALONE)?
F	Do your family or FRIENDS ever tell you that you should cut down on your drinking or drug use?
T	Have you gotten in TROUBLE while you were using drugs or alcohol?

Physical Examination of Drug Overdose

A physical examination includes the monitoring of the vital signs; **blood pressure, heart rate, respiratory rate, temperature, and oxygen saturation**. It helps in the assessment of the severity of the patient's condition.

Some physical signs give clues regarding the type of drug used:

- Small pinpoint pupils (miosis), multiple intravenous track marks, depressed respiratory rate, and phlebitis in opioid poisoning
- Small pinpoint pupils, increased salivation, chest congestion, depressed mental state, muscle fasciculations, and bradycardia in organophosphate poisoning
- Nasal septal damage, palpitations, tachycardia, and anxiety in cocaine use
- Hot dry skin with delirium in atropine overuse
- Bitter almond smell of cyanide poisoning
- Hyperventilation in aspirin overdose

Clinical Features of Drug Overdose

Patients experiencing drug overdose usually present as one of the following:

1. Unconscious patients

These patients are more likely to be affected by CNS depressants like opiates and benzodiazepines. Airway support is the priority in these patients.

2. Hyper-stimulated patients

Amphetamine, cocaine, and other stimulants produce hyperstimulation. Cardiovascular and neurological assessments are important as these patients are prone to cardiac arrhythmias and seizures.

3. Patients with acute psychotic conditions

Exposure to stimulants and cannabinoids may result in acute psychotic episodes. These patients are a risk to staff and themselves. Chemical sedation with short-acting benzodiazepines and antipsychotics is a priority.

Clinical presentation

Drug	Clinical features
Alcohol	Disinhibition, slurred speech, ataxia , emotional lability, 'blackouts'
Marijuana	Euphoria, red conjunctivae, dry mouth and throat, increased appetite, impaired reaction time, gynecomastia (chronic use)
Stimulants	Hyper-alertness, restlessness, agitation, aggression, paranoia, tachycardia , hypertension , arrhythmias, dilated pupils, seizures
Opioids	Drowsiness, euphoria, flushing, floating feeling, constipation, miosis, respiratory depression, hypotension

Hallucinogens	Dizziness, heightened sensual awareness, nausea, hallucinations, flushing, elevated temperature, tachycardia, mydriasis
Inhalants	Dizziness, headaches , slurred speech, sleepiness, lacrimation, rhinorrhea, mucous membrane irritation, ataxia, impaired memory

Outpatient Management of Drug Abuse Cases

- Outpatient management requires structured programs, the willingness for regular follow-up visits by the patient, and intensive counseling
- Realistic goals to quit drugs
- Psychological interventions (therapy)

Indications for Inpatient Management

- All patients with suspected acute poisoning should be admitted for observation
- They should also be admitted if there is a risk they could harm themselves or others
- Failure of sufficient outpatient therapy
- Severe medical or psychiatric morbidity
- Detoxification

Diagnostic Steps

1. Screen for other mental health problems
2. Laboratory findings (urine and/or blood)
 - HIV testing
 - STD testing if indicated
 - Testing should target problem
3. Drug testing if necessary or if hospitalized

Management of Specific Drugs Overdose

Paracetamol

Paracetamol is the most common drug overdose in the United States. Its overdose causes liver damage (hepatotoxicity).

A Rumack-Matthew nomogram is used to predict adverse effects depending on the paracetamol blood levels and administration of an antidote. The nomogram can only be used if the paracetamol overdose occurred within the last 24 hours.

N-acetylcysteine is the specific antidote for paracetamol overdose. It should be started as early as possible, either orally or intravenously, for maximum efficacy.

Amphetamines and Cocaine

These are sympathomimetics and stimulate the cardiac and neurologic systems.

- CNS stimulant: euphoria, psychosis, seizures, hallucinations, delirium, agitation, and may cause a stroke
- Cardiac stimulant: hypertension, palpitations, hyperthermia, and possibly,

acute coronary syndrome

- Serotonin syndrome may occur if a patient is already on SSRIs or SNRIs

Management

The management is symptomatic and supportive.

- Agitation seizures and hypertension: benzodiazepines
- Arrhythmias: sodium bicarbonate and amiodarone
- Hyperthermia: intravenous fluids and ice packs
- Acute coronary syndrome (ACS): aspirin, nitrates, and opiate analgesics

Ecstasy (MDMA)

3, 4-methylenedioxymethamphetamine (MDMA), commonly called ecstasy, is a drug used recreationally, especially by teenagers at dance parties. It increases intimacy, sex drive, and causes euphoria.

- It stimulates the CNS and cardiac systems resulting in delirium, seizures, palpitations, hypertension, and anxiety
- It also causes bruxism
- It causes hyperthermia and increases thirst
- Hyponatremia occurs due to increased water intake as a result of hyperthermia and thirst

The treatment for ecstasy overdose is similar to that for amphetamine overdose. Hyponatremia is treated with hypertonic saline.

Opiates

- Small pinpoint pupils (miosis), depressed mental state, and slow shallow breathing (< 10 breaths per minute) are suggestive of opiate overdose.

Complications

- Respiratory failure (hypercapnia)
- Hypothermia
- Rhabdomyolysis
- Aspiration pneumonitis
- Pulmonary edema (Non-cardiogenic)

Management

- Oxygen and respiratory support take priority in all patients suspected with opiate poisoning
- Naloxone, an opiate receptor antagonist, reverses the effects of an opioid overdose
- Supportive care including intravenous fluids, re-warming in the case of hypothermia, and maintenance of normoglycemia

Cannabis

Acute cannabis intoxication has the following clinical features:

- Anxiety, altered mood, and depersonalization
- Agitation and psychosis
- Disorientation and memory impairment

- Tachycardia, palpitations, and paroxysmal atrial fibrillation
- Orthostatic hypotension
- Hallucinations

Management

Acute cannabis toxicity is usually NOT a serious problem. Symptoms resolve within 4–12 hours of ingestion.

- Reassurance is often sufficient in acute cannabis toxicity
- Antiemetics for nausea and vomiting
- Antipsychotics
- Benzodiazepines to treat agitation

Methods of Gastrointestinal Decontamination

1. Activated charcoal

Indication:

Patient presents within 1 hour of ingestion of a toxic substance.

Contraindications:

- Decreased level of consciousness
- Abused drug has a low binding affinity for activated charcoal, e.g., lithium
- GI bleeding or GI perforation risk

2. Gastric lavage

Indication:

It is used in situations where a potentially toxic amount of medication has been consumed within 1 hour.

Contraindications:

- Compromised airway
- Ingestion of strongly acidic or alkaline substance
- GI bleeding or perforation risk

Antidotes

The available antidotes for some of the common drugs are provided in the table below:

Indication	Antidote
Anticholinergics	Physostigmine
Arsenic, Lead, Mercury	BAL (Dimercaprol); Dimercaptosuccinic Acid; Penicillamine
Benzodiazepines	Flumazenil
B-blockers	Glucagon
Cyanide	Nitrite/Sodium Thiosulphate
Digoxin and Cardiac Glycosides	Digoxin-specific Fab Fragments
Ethylene Glycol	Fomepizole
Iron	Desferrioxamine

Isoniazid	Pyridoxine
Methaemoglobin	Methylene blue
Opioids	Naloxone
Organophosphates	Atropine; Pralidoxime
Paracetamol	N-acetylcysteine

Complications of Drug Overdose

- Drug overdose leads to serious morbidity and mortality
- There is an increased risk of endocarditis, hepatitis, and HIV among intravenous drug users
- Addiction: criminal acts to sustain drug activity, theft, prostitution

Prevention of Drug Overdose

- Parents should be positive role models. They should be aware of their children's addictions and whereabouts. They should also guide their children and educate them about the harms of substance abuse
- Children with positive self-esteem and supportive family relationships are less likely to indulge in substance abuse
- Keep all medicines out of the reach of children

References

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