CONDITION

# Overdose

An overdose happens when a substance overwhelms the body and causes harmful effects.

**WHAT IT IS**
Harm from more substance than the body can safely handle

**BODY SYSTEM**
Nervous system, breathing, heart, circulation, liver, and kidneys

**MAIN SYMPTOMS**
Extreme sleepiness, confusion, vomiting, slow or difficult breathing

**WHAT CAUSES IT**
Excess medicines, drugs, alcohol, chemicals, or mixed substances

**HOW IT IS DIAGNOSED**
Clinical assessment, ECG, blood tests, and substance testing

**MAIN TREATMENT**
Emergency support, antidotes when available, and monitoring

**CAN IT BE CURED?**
Sometimes - prompt treatment can reverse toxic effects

**IS IT AN EMERGENCY?**
Yes - suspected overdose needs immediate expert advice

**LONG-TERM OUTLOOK**
Full recovery possible; severe oxygen loss can cause disability

## Overview

An overdose happens when a medicine, drug, alcohol, or other substance causes more harm than the body can safely manage. It may involve too much of one substance or a dangerous combination of substances.

Overdoses can be accidental or intentional. An accidental overdose may result from taking an extra dose, confusing products, using a substance of unexpected strength, or combining substances that affect the body in similar ways. Taking something to cause self-harm is also an overdose, regardless of the amount.

Any substance can be harmful under certain circumstances. Prescription medicines, non-prescription painkillers, illegal drugs, alcohol, household chemicals, and herbal products can all be involved. The harmful amount is different for each substance and person.

Some overdoses quickly affect breathing, consciousness, or heart rhythm. Others, including overdoses of paracetamol, also called acetaminophen, may cause few early symptoms before serious organ damage develops. Do not wait for symptoms if an overdose may have happened.

## Symptoms

Symptoms depend on the substance, amount, route of exposure, time since exposure, and whether several substances were taken together.

Possible signs include:

An opioid overdose often causes very slow or stopped breathing, extreme sleepiness, and pinpoint-sized pupils. Opioids like oxycodone or morphine include heroin, fentanyl, morphine, oxycodone, and similar pain medicines.

Stimulants such as cocaine or methamphetamine may cause severe agitation, overheating, chest pain, seizures, or a very fast heartbeat. Sedatives and alcohol can suppress breathing and make a person difficult to wake, especially when combined with opioids.

Symptoms may be delayed. Slow-release tablets can keep releasing medicine for hours, and some toxic substances damage the liver, kidneys, or other organs before the person feels seriously unwell.

- Unusual sleepiness, inability to wake, confusion, or agitation
- Slow, shallow, irregular, noisy, or stopped breathing
- Very small or unusually large pupils
- Vomiting, stomach pain, sweating, or pale, blue, or grey skin
- Seizures, collapse, chest pain, or an abnormal heartbeat

## Causes and risk factors

An overdose can happen after swallowing, injecting, inhaling, or absorbing a substance through the skin. Common circumstances include taking a second dose by mistake, misunderstanding a label, or using more because the expected effect has not started yet.

Risk may be higher when:

Tolerance means the body has become used to a substance. It can fall after detoxification, hospital care, imprisonment, or a period without use. Returning to a previous amount can then cause an overdose.

Older adults may be more affected by some medicines because the body processes them differently. However, overdose can happen at any age and does not always mean that a person has a substance use disorder.

- Opioids, alcohol, sleeping medicines, or anti-anxiety medicines are combined
- A person returns to drug use after a break and has lower tolerance
- Counterfeit or illegally produced drugs contain unexpected substances or strengths
- Kidney or liver problems slow the removal of a medicine
- Several products contain the same active ingredient
- Medicines are accessible to children or someone with memory difficulties

## Diagnosis

A suspected overdose is diagnosed from the circumstances, symptoms, physical examination, and targeted tests. Treatment often begins before the exact substance is confirmed.

Emergency clinicians check breathing, oxygen level, pulse, blood pressure, temperature, alertness, and blood sugar. An electrocardiogram, or ECG, records the heart's electrical activity and can identify dangerous rhythm changes.

Blood tests may check kidney and liver function, body salts, acidity, and levels of certain medicines. Paracetamol and salicylate levels are commonly measured when those substances may be involved. Other tests depend on the suspected exposure.

Urine drug screens have limits. They may miss some substances, remain positive after effects have passed, or detect a drug without showing how much was taken. Results are interpreted alongside the symptoms and exposure history.

Packaging, medication lists, photographs, or information from witnesses can help. Do not delay emergency care while trying to identify every substance.

## Treatment and management

If an overdose may have happened, contact emergency services or a poison information service immediately. A poison specialist can advise whether observation at home is safe after a minor dosing error, but this decision should not be made by waiting for symptoms.

While help is coming:

Naloxone temporarily blocks opioid effects and can restore breathing. It does not reverse

overdoses from other substances, but it generally does not harm someone if opioids are not responsible. Its effect can wear off before the opioid does, so emergency assessment is still necessary. More than one dose may be needed according to the product instructions and emergency guidance.

Hospital treatment focuses first on protecting breathing, circulation, and the brain. This may include oxygen, assisted ventilation, intravenous fluids, seizure treatment, temperature control, or medicines for dangerous heart rhythms.

Specific antidotes are available for some substances. Examples include naloxone for opioids and acetylcysteine for paracetamol poisoning. Activated charcoal may reduce absorption in selected cases, but it is not suitable for every overdose and can be dangerous if used without professional supervision. Dialysis may remove certain poisons from the blood.

Monitoring may last several hours or longer, depending on the substance, symptoms, test results, and whether a slow-release product was involved. After an intentional overdose, care should also include compassionate mental health assessment and safety planning.

- Give naloxone if opioid overdose is possible and it is available
- Follow emergency-dispatch instructions for rescue breathing or CPR
- Place an unconscious but breathing person on their side
- Do not cause vomiting or give food, drink, or home remedies
- Keep medicine containers or substance packaging for emergency staff
- Stay with the person unless doing so would put you in danger

## Complications

An overdose can reduce oxygen reaching the brain and other organs. This may lead to brain injury, coma, disability, or death. Vomit entering the lungs can cause choking or pneumonia.

Other complications depend on the substance and may include:

Prompt treatment lowers the chance of serious harm, but it cannot always prevent complications.

- Dangerous heart rhythms or cardiac arrest
- Seizures, overheating, or muscle breakdown
- Liver or kidney failure
- Bleeding, severe acid imbalance, or lung injury

- Injury from falling or losing consciousness

## Prevention

Many overdoses can be prevented, although not every exposure is predictable. Practical steps include taking medicines only as directed and checking the active ingredients before combining products.

Keep an up-to-date medicine list. Using one pharmacy when possible can make interaction checks easier. Ask a pharmacist before mixing medicines with alcohol, sleep aids, anti-anxiety medicines, or opioid painkillers.

Store medicines and chemicals in their original containers, secured away from children and anyone who might take them by mistake. Use the measuring device supplied with liquid medicine rather than a household spoon. Dispose of unused medicines through an approved return program when available.

People who use opioids, and those around them, can carry naloxone and learn how to use it. Avoiding opioids alone and recognizing that tolerance falls after a break can reduce risk. Illegally produced pills or powders may contain fentanyl or other unexpected substances, even when they resemble prescription medicines.

If you are worried about your own substance use, treatment can reduce overdose risk. Support may include counselling, peer services, and medicines for opioid or alcohol use disorder.

## Living with it and what to expect

An overdose is usually an acute event rather than a lifelong condition. Some people recover fully within hours or days. Recovery can take longer after a severe overdose, prolonged lack of oxygen, organ damage, or complications such as pneumonia.

After discharge, follow instructions about repeat blood tests, medicine changes, wound care, or follow-up appointments. Tiredness, worry, poor sleep, or distress about what happened can continue for a while. Persistent or worsening symptoms deserve medical review.

If substance use contributed, the risk does not end when the immediate effects pass. Reduced tolerance can make another overdose more likely. Ongoing treatment, naloxone access, and a personal safety plan can lower risk. Recovery from a substance use disorder is possible, but its course differs from person to person.

An intentional overdose may be linked to a mental health crisis rather than a continuing wish to

die. Follow-up support should address safety, emotional health, and the reasons the overdose occurred without blame or stigma.

## When to get medical help

Treat a suspected overdose as an emergency. Call your local emergency number immediately if someone:

Use naloxone if opioid overdose is possible, but do not delay the emergency call. Begin CPR or rescue breathing if instructed and if you are able.

For a possible dosing mistake without symptoms, contact a poison information service promptly. Do not wait to see what happens, because some effects are delayed. In the United States, Poison Help is available at 1-800-222-1222 . Elsewhere, use your local poison service or emergency number.

After hospital treatment, seek urgent reassessment for increasing sleepiness, trouble breathing, repeated vomiting, fainting, seizures, chest pain, yellow skin or eyes, severe abdominal pain, or worsening confusion.

Routine follow-up is appropriate for medication review, repeat laboratory tests, mental health support, or treatment for substance use after the immediate danger has passed.

- Cannot be woken or has collapsed
- Is breathing slowly, irregularly, or not at all
- Has blue, grey, or very pale lips or skin
- Has a seizure, severe confusion, chest pain, or extreme agitation
- May have taken an overdose intentionally
- Has swallowed an unknown chemical or dangerous substance

## Common questions

Can you overdose without realizing it?

Yes. A person may accidentally repeat a dose, combine products containing the same ingredient, or take a counterfeit drug of unexpected strength. Some overdoses cause little discomfort at first. Contact a poison service or emergency service rather than relying on early symptoms.

Can someone sleep off an overdose?

No. A person who seems to be sleeping may have dangerously reduced consciousness or breathing. If the person is unusually difficult to wake, breathing abnormally, or making choking or gurgling sounds, call emergency services immediately.

How long does an overdose last?

The time course depends on the substance, amount, and formulation. Some effects improve within hours, while slow-release medicines or long-acting drugs can cause problems much later. Organ damage may take days to appear or recover. Medical monitoring should continue for the period advised by the treating service.

What happens if naloxone is given when opioids are not involved?

Naloxone will not reverse alcohol, sedative, or stimulant poisoning. It generally has no significant effect if opioids are absent. If opioid dependence is present, it can trigger sudden withdrawal. Because it acts only temporarily, the person still needs emergency care.

Can an overdose cause permanent damage?

It can, particularly if breathing stops long enough to deprive the brain of oxygen or if the substance severely damages the liver, kidneys, heart, or lungs. Many people recover fully after timely treatment, but no outcome can be guaranteed.

Does every extra dose require hospital treatment?

Not necessarily, but the safe response depends on the exact medicine, strength, amount, timing, age, health conditions, and symptoms. Contact a poison information service promptly for an individual risk assessment. Call emergency services for symptoms, an unknown amount, or an intentional overdose.

## Sources

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