CONDITION

# Isopropanol alcohol poisoning

Isopropanol alcohol poisoning is harmful intoxication caused by swallowing, inhaling, or absorbing rubbing alcohol

**WHAT IT IS**
Toxic exposure to isopropanol, commonly called rubbing alcohol

**BODY SYSTEM**
Brain, breathing, digestive, and circulatory systems

**MAIN SYMPTOMS**
Vomiting, stomach pain, confusion, severe drowsiness

**WHAT CAUSES IT**
Swallowing, inhaling, or absorbing isopropanol

**HOW IT IS DIAGNOSED**
Blood isopropanol level, acetone level, and chemistry tests

**MAIN TREATMENT**
Supportive hospital care, with dialysis rarely needed

**CAN IT BE CURED?**
Yes - most recover as the chemical clears

**IS IT AN EMERGENCY?**
Yes - especially after swallowing or with severe drowsiness

**LONG-TERM OUTLOOK**
Most survivors recover fully after an isolated exposure

## Overview

Isopropanol, also called isopropyl alcohol or rubbing alcohol, is a chemical found in disinfectants, cleaning products, hand sanitizers, solvents, and some cosmetics. It is not the same as the ethanol in alcoholic drinks.

Poisoning most often happens after isopropanol is swallowed. It can also occur after heavy exposure to fumes or prolonged contact with a large area of skin. Small amounts used as directed on intact skin are unlikely to cause poisoning.

The body changes isopropanol into acetone, another chemical that can affect the brain. Both substances slow brain activity. Larger exposures can also irritate the stomach, lower blood pressure, and suppress breathing.

Isopropanol poisoning can resemble severe drunkenness, but it may become more serious. There is no specific antidote. Treatment supports breathing and circulation while the body removes the chemicals.

Any suspected swallowing needs prompt advice from a poison centre or medical professional. Do not wait for symptoms to appear.

## Symptoms

Symptoms often begin quickly, sometimes within 30 minutes to a few hours. The timing and severity are influenced by the amount, product strength, route of exposure, whether food was in the stomach, and whether other substances were involved.

Common early symptoms include:

Isopropanol strongly irritates the stomach lining. Vomit may occasionally contain blood, or it may look dark and grainy like coffee grounds. This can indicate bleeding in the stomach.

Severe poisoning can cause very slow or shallow breathing, low body temperature, low blood pressure, loss of consciousness, or coma. Vomiting while very drowsy also creates a risk of aspiration, meaning vomit enters the lungs.

Fumes may irritate the eyes, nose, and throat. Heavy inhalation exposure can cause headache, dizziness, nausea, or drowsiness. Skin exposure may cause dryness or irritation. Poisoning through the skin is unusual but is more possible with prolonged exposure, damaged skin, soaked clothing, or large treated areas.

Symptoms alone cannot show how much isopropanol entered the body.

- Nausea, vomiting, and stomach pain
- Dizziness, poor coordination, or slurred speech
- Headache and confusion
- Unusual tiredness or difficulty staying awake
- An alcohol-like or fruity smell on the breath

## Causes and risk factors

Poisoning is caused by enough isopropanol entering the body to produce harmful effects. Swallowing is the most common route in serious cases.

Accidental exposure may happen when rubbing alcohol or cleaning fluid is stored in an

unlabelled container, especially one normally used for drinks. Young children may swallow a product left within reach.

Some people intentionally swallow isopropanol for its intoxicating effect or during self-harm. It is more toxic than beverage alcohol and is not a safe substitute for it. Products may also contain other ingredients that add to the risk.

Heavy workplace exposure may occur where isopropanol is used in a poorly ventilated area. Risk also increases when wet clothing remains against the skin or when the chemical is repeatedly applied over a large area.

Children and older adults may become seriously affected by smaller amounts than a healthy adult. Existing breathing or circulation problems may make severe poisoning harder to tolerate. Taking sedatives, opioids like oxycodone or morphine , beverage alcohol, or other toxic substances at the same time can change the symptoms and treatment.

## Diagnosis

Diagnosis begins with the exposure history and the person's symptoms. If possible, the product container or a photograph of its label should go to the hospital. This helps identify its ingredients and concentration.

Blood tests may directly measure isopropanol and acetone. These tests confirm exposure, but results may not be available quickly. Treatment should not be delayed while waiting for them.

Other tests help assess the effects of poisoning. These may include blood glucose, electrolytes, kidney function, liver tests, blood acidity, and a measure called serum osmolality. Osmolality reflects the number of dissolved particles in the blood. An unexpectedly high result can support a diagnosis of toxic alcohol exposure.

Isopropanol commonly causes ketones in the blood or urine because it is converted into acetone. Unlike methanol and ethylene glycol, it usually does not cause a major buildup of acid in the blood. Significant acid buildup may point to shock, another illness, or an additional substance.

Acetone can interfere with some laboratory methods and make the creatinine result appear high. Creatinine is used to assess kidney function. Clinicians interpret this result alongside the other findings.

Heart monitoring, a chest X-ray, or further testing may be needed if there are breathing problems, aspiration, low blood pressure, injury, or concern about mixed poisoning.

## Treatment and management

Isopropanol poisoning is treated mainly with supportive care. This means protecting essential body functions while the liver and kidneys clear isopropanol and acetone.

Hospital treatment may include:

There is no standard antidote for isopropanol. Fomepizole and ethanol can block the enzyme that processes some toxic alcohols, but they are generally not used for isolated isopropanol poisoning. Blocking that enzyme can slow removal of isopropanol, while its breakdown product, acetone, is not responsible for the severe acid injury seen with methanol or ethylene glycol.

Activated charcoal usually does not help because isopropanol is absorbed rapidly and charcoal does not bind alcohols well. Giving anything by mouth to a drowsy person may also cause choking or aspiration. Do not induce vomiting.

Haemodialysis, which filters the blood through a machine, can remove isopropanol and acetone. It is rarely needed. It may be considered for exceptionally severe poisoning, such as persistent low blood pressure, coma, or worsening illness despite intensive supportive care.

Mental health support is an important part of treatment when exposure was intentional. This is separate from blame or punishment and aims to reduce the risk of another harmful event.

- Oxygen and close monitoring of breathing
- A breathing tube and ventilator if breathing is severely suppressed
- Fluids through a vein to support circulation
- Medicines to raise blood pressure if fluids are not enough
- Treatment for low body temperature, vomiting, or other complications
- Repeated blood tests and heart monitoring

## Complications

Many people recover with observation and supportive treatment, but severe poisoning can cause complications.

Possible complications include inflammation or bleeding in the stomach, aspiration pneumonia, respiratory failure, shock, and injury caused by a fall while confused. Aspiration pneumonia occurs when vomit or stomach contents enter the lungs and cause inflammation or infection.

Very low blood pressure or prolonged lack of oxygen can injure the brain, kidneys, heart, or

other organs. These complications, rather than acetone alone, are more likely to affect long-term recovery.

Death is possible after a large exposure, particularly when treatment is delayed or other depressant substances were also taken. Most people who receive timely care and do not develop severe oxygen deprivation or shock recover without lasting effects.

## Prevention

Most accidental isopropanol poisonings can be prevented.

Keep rubbing alcohol, sanitizers, solvents, and cleaning products in their original labelled containers. Never pour them into drinking bottles, cups, or food containers. Store them securely away from children and from anyone at risk of intentional ingestion.

Use isopropanol products according to their labels and in a well-ventilated space. Avoid prolonged contact with large areas of skin. Remove soaked clothing and wash exposed skin. Workplaces should follow their chemical-handling, ventilation, and protective-equipment procedures.

Do not drink rubbing alcohol or use it as a substitute for beverage alcohol. If a person is drinking non-beverage alcohol because of dependence, withdrawal concerns, or difficulty getting support, medical and addiction services can provide safer help.

## Living with it and what to expect

Isopropanol poisoning is usually a single acute event rather than a long-term condition. Symptoms may continue for many hours because the body must clear both isopropanol and acetone. Severe exposure may require monitoring in intensive care.

A person who remains alert, has stable breathing and blood pressure, and shows improving test results may need only a period of observation. Recovery takes longer after coma, aspiration, shock, or injury.

Most survivors of an uncomplicated exposure return to their previous health. Isopropanol does not usually remain stored in the body or cause an ongoing poisoning syndrome once it has been cleared. Long-term effects are more likely if the brain or other organs were injured by low oxygen or very low blood pressure.

Routine follow-up may be needed after stomach bleeding, lung aspiration, kidney problems, or a prolonged hospital stay. Ongoing workplace symptoms should prompt an occupational

health assessment so that ventilation and exposure controls can be reviewed.

After intentional ingestion, follow-up may include mental health or substance-use care. Support can address the reasons for the exposure and help reduce future risk.

## When to get medical help

Contact a poison centre immediately after any suspected swallowing of isopropanol, even if there are no symptoms. In the United States, Poison Help is available at 1-800-222-1222 . Elsewhere, use your local poison information service. Keep the container nearby, but do not delay the call while looking for it.

Call emergency services now if the person:

Do not make the person vomit. Do not give food, drinks, activated charcoal, or home remedies unless a poison specialist specifically directs this.

Move someone with heavy fume exposure into fresh air without entering an unsafe area yourself. Remove contaminated clothing after skin exposure and rinse the skin with water. Rinse exposed eyes promptly with clean, lukewarm water. A poison centre can advise whether further assessment is needed.

- Cannot be awakened or is becoming increasingly drowsy
- Has slow, shallow, difficult, or stopped breathing
- Has collapsed, had a seizure, or is severely confused
- Is vomiting repeatedly or vomiting blood
- Has pale, cold, or bluish skin
- May have swallowed a large amount or several substances
- Was exposed during an act of self-harm

## Common questions

Can drinking rubbing alcohol make you drunk?

It can cause intoxication, but this is poisoning rather than a safe form of drunkenness. Isopropanol is more potent at slowing brain activity than beverage alcohol and can cause vomiting, stomach bleeding, low blood pressure, coma, and breathing problems.

How quickly does isopropanol poisoning start?

Symptoms often start within 30 minutes to a few hours after swallowing. Food in the stomach and the amount taken can affect the timing. Do not wait for symptoms before contacting a poison centre.

Can rubbing alcohol poison you through your skin?

Normal, brief use on a small area of intact skin is unlikely to cause systemic poisoning. Risk increases with prolonged contact, large treated areas, broken skin, soaked clothing, or repeated exposure. Infants and small children may be more vulnerable.

Is there an antidote for isopropanol?

There is no usual antidote. Treatment supports breathing, blood pressure, temperature, and hydration while the body clears the chemical. Blood-filtering dialysis is reserved for rare, exceptionally severe cases.

How long does recovery take?

Mild effects may improve over several hours, while significant poisoning can require hospital monitoring for a day or longer. Recovery may take more time if aspiration, shock, organ injury, or another substance is involved.

Is isopropanol the same as methanol?

No. They are different toxic alcohols. Methanol can cause severe acid buildup, blindness, and delayed injury. Isopropanol more often causes rapid intoxication, stomach irritation, ketosis, and low blood pressure. Both require urgent expert assessment after swallowing.

## Sources

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