CONDITION

Hydrogen peroxide poisoning

Hydrogen peroxide poisoning is harmful irritation or injury caused by swallowing, breathing, or touching hydrogen peroxide.

WHAT IT IS
Toxic injury from swallowing, breathing, or touching hydrogen peroxide

BODY SYSTEM
Digestive, breathing, eyes, skin, brain, heart and circulation

MAIN SYMPTOMS
Nausea, vomiting, abdominal pain, mouth or eye irritation

WHAT CAUSES IT
Accidental or intentional exposure, especially to concentrated products

HOW IT IS DIAGNOSED
Exposure history, examination, and imaging for internal gas

MAIN TREATMENT
Decontamination, supportive care, oxygen, and burn treatment

CAN IT BE CURED?
Sometimes - mild exposures resolve; severe injury may persist

IS IT AN EMERGENCY?
Sometimes - breathing trouble, severe pain, or neurological symptoms

LONG-TERM OUTLOOK
Usually full recovery; severe burns or embolism can cause disability

Overview

Hydrogen peroxide poisoning happens when hydrogen peroxide damages the body after it is swallowed, breathed in, splashed into the eyes, or left on the skin.

Many household products contain about 3% hydrogen peroxide. Small accidental exposures to these products often cause temporary irritation. More concentrated products, including some industrial, laboratory, hair-processing, and products sold as "food grade," can cause deep chemical burns and life-threatening complications.

Hydrogen peroxide quickly breaks down into water and oxygen. Inside the stomach or tissues, this can release a large amount of oxygen gas. The gas may stretch or injure the digestive tract. In serious cases, bubbles can enter blood vessels. This is called a gas embolism , which can block blood flow to the brain, heart, or other organs.

The risk is affected by the product's concentration, the amount involved, how exposure happened, and how quickly appropriate care begins. Any swallowed concentrated product needs prompt expert assessment.

Symptoms

Symptoms can begin within minutes, although some chemical-burn complications appear later.

After swallowing hydrogen peroxide, symptoms may include:

Small tastes of ordinary household-strength peroxide may cause only mild irritation or stomach upset. Concentrated peroxide can cause severe burns even when the swallowed amount seems small.

Breathing mist or vapour may cause coughing, throat irritation, chest tightness, or shortness of breath. This is more likely around concentrated products, spraying equipment, or a poorly ventilated spill.

Skin exposure may cause stinging, redness, temporary whitening, blisters, or burns. Eye exposure can cause immediate pain, tearing, redness, light sensitivity, or blurred vision. Concentrated peroxide can seriously damage the eye.

Signs that oxygen bubbles may be affecting the brain, heart, or lungs include sudden confusion, weakness, trouble speaking, loss of balance, vision changes, seizures, chest pain, severe breathlessness, or collapse. These are emergency symptoms.

- Foaming in the mouth, burping, nausea, or vomiting
- Abdominal pain, bloating, or a swollen feeling
- Burning in the mouth, throat, chest, or stomach
- Trouble swallowing
- Vomit containing blood or dark material

Causes and risk factors

Poisoning is caused by exposure to enough hydrogen peroxide to irritate or damage tissue. Swallowing is the most common route linked to serious internal injury.

Accidental exposures can happen when peroxide is stored in a drink bottle, cup, or other unlabelled container. Children may drink it if it is within reach. Adults may mistake clear concentrated peroxide for water.

Some people swallow "food-grade" hydrogen peroxide because of unsupported health claims. The term "food grade" describes how a product was manufactured; it does not mean the concentrated liquid is safe to drink.

Risk is higher with:

Deliberate swallowing can cause severe poisoning and may also signal a mental health emergency.

- Products containing a high concentration of hydrogen peroxide
- A larger or prolonged exposure
- Delayed rinsing after an eye or skin splash
- Workplace exposure without suitable protective equipment
- Spraying or heating peroxide in an enclosed space
- Using peroxide in ways not listed on the product label

Diagnosis

Diagnosis starts with finding out what happened. The healthcare team will need the product name, concentration, estimated amount, time of exposure, and route of exposure. Bringing the original container or a clear photograph of its label can help, but care should not be delayed to find it.

There is no single blood test that confirms every case. Examination focuses on breathing, alertness, abdominal tenderness, burns, and eye or skin injury.

Blood tests may help assess organ function or the effects of serious illness. A chest X-ray or CT scan may be used when there is concern about digestive tract damage, internal gas, or a gas embolism. CT is especially useful for locating gas in blood vessels or organs.

After a significant corrosive ingestion, a specialist may use an endoscope-a flexible camera passed through the mouth-to examine the oesophagus and stomach for burns. Eye exposure may require a detailed examination after thorough rinsing.

Treatment and management

Treatment begins by stopping exposure. Move away from fumes if this can be done safely. Remove contaminated clothing and rinse exposed skin with plenty of running water. An exposed eye should be rinsed immediately with clean, lukewarm water while removing contact

lenses if they come out easily.

Do not induce vomiting after hydrogen peroxide is swallowed. Vomiting can expose the throat to the chemical again and may allow foam or liquid to enter the lungs. Do not try to neutralise peroxide with another chemical. Activated charcoal does not reliably bind hydrogen peroxide and may interfere with assessment.

Contact a poison information service promptly for advice after ingestion or any significant exposure. In the United States, Poison Help is available at 1-800-222-1222 . Elsewhere, use your local poison centre or emergency service. Do not give food or drink to someone who is drowsy, having a seizure, vomiting repeatedly, or struggling to swallow.

Hospital care may include monitoring, medicines for pain or nausea, intravenous fluids, oxygen, and treatment of chemical burns. Breathing support may be needed in severe cases. Specialists may monitor for injury to the oesophagus or stomach and manage complications such as bleeding or perforation.

A suspected arterial gas embolism needs emergency treatment. High-flow oxygen is commonly used. Some people are treated in a hyperbaric chamber, where oxygen is given under increased pressure to reduce gas bubbles and improve oxygen delivery. The decision is based on symptoms, imaging, and specialist assessment.

Antibiotics like amoxicillin or doxycycline , steroids like prednisone or hydrocortisone , surgery, or other treatments are not automatically needed. They are considered only for specific complications.

Complications

Concentrated hydrogen peroxide can burn the mouth, oesophagus, stomach, skin, or eyes. Severe digestive tract burns may cause bleeding, a hole in the stomach or intestine, or leakage into nearby tissues.

Gas produced in the stomach may enter veins leading to the liver. More dangerously, gas can reach arteries and interrupt blood flow to the brain or heart. This may cause a stroke-like injury, abnormal heart rhythm, heart damage, seizures, or loss of consciousness.

Vomiting and foaming can allow peroxide or stomach contents to enter the lungs. This is called aspiration and can cause breathing problems or lung inflammation.

As a digestive burn heals, scar tissue can sometimes narrow the oesophagus. This may lead to increasing difficulty swallowing over the following weeks or months. Serious eye burns can leave lasting vision problems.

Prevention

Most hydrogen peroxide poisoning can be prevented by safe storage and use.

Keep peroxide in its original, clearly labelled container. Never place it in a bottle, glass, or food container. Store it away from children and from medicines, drinks, and cooking products.

Follow the product label and use appropriate gloves, eye protection, and ventilation when directed. Do not swallow hydrogen peroxide or use concentrated "food-grade" peroxide as a health treatment. There is no established health benefit that makes drinking it safe.

Do not mix peroxide with household cleaners or other chemicals. Mixing products can create irritating or corrosive substances. Dispose of unwanted peroxide according to the label and local hazardous-waste advice.

Living with it and what to expect

After a minor exposure to household-strength peroxide, irritation and stomach upset often improve within hours. Skin whitening from brief contact is usually temporary. An eye splash may settle after prompt rinsing, but persistent pain or vision changes need assessment.

Recovery after concentrated exposure can take longer. Burns to the digestive tract may require hospital monitoring and follow-up over weeks or months. New or worsening trouble swallowing can indicate narrowing caused by scar tissue.

People who have had a gas embolism may recover fully, but some have lasting neurological problems such as weakness, changes in thinking, or seizures. Rehabilitation may be needed after a serious brain injury. Eye injuries can also require ongoing specialist care.

Keep any recommended follow-up appointments after a significant exposure, even if symptoms improve. Routine follow-up is especially important after documented burns, swallowing problems, lung injury, eye damage, or neurological symptoms.

When to get medical help

Call emergency services now if exposure is followed by:

These symptoms may indicate a serious chemical burn, aspiration, or gas embolism.

Contact a poison centre promptly after any swallowed hydrogen peroxide, particularly if the concentration is unknown or above ordinary household strength. Do not wait for symptoms after swallowing a concentrated product.

After an eye splash, start rinsing immediately. Urgent medical assessment is needed for ongoing pain, blurred vision, light sensitivity, or exposure to a concentrated product. Seek urgent advice for blistering skin, a large exposed area, or pain that continues after rinsing.

Arrange routine follow-up after discharge if swallowing becomes more difficult, abdominal symptoms return, or recovery is not progressing as expected.

- Trouble breathing, severe chest pain, or blue or grey lips
- Sudden confusion, weakness, vision loss, or trouble speaking
- A seizure, collapse, or inability to wake
- Severe or rapidly worsening abdominal pain
- Vomiting blood
- Significant swelling or burns of the mouth or throat

Common questions

What happens if I accidentally swallow a small amount of 3% hydrogen peroxide?

A small taste may cause foaming, burping, nausea, vomiting, or mild stomach irritation. Serious injury is less likely than with concentrated peroxide, but the amount and circumstances still matter. Rinse your mouth, do not make yourself vomit, and contact a poison centre for advice specific to the exposure.

Is "food-grade" hydrogen peroxide safe to drink?

No. Products described as food grade are often highly concentrated and can cause deep burns, internal gas formation, gas embolism, and death. "Food grade" does not mean safe to drink, even when the product is diluted at home.

Why does hydrogen peroxide foam after it is swallowed?

Hydrogen peroxide breaks down into water and oxygen. The released oxygen forms bubbles and foam. In the stomach, the same reaction can cause bloating, vomiting, or gas inside blood vessels.

Can hydrogen peroxide poisoning cause a stroke?

It can cause stroke-like symptoms if oxygen bubbles enter arteries and block blood flow to the brain. Sudden weakness, confusion, trouble speaking, seizures, or vision changes after exposure require emergency care.

Can I treat hydrogen peroxide poisoning at home?

Brief skin contact or a minor household-strength splash may only require thorough rinsing and poison-centre advice. Swallowing concentrated peroxide, serious eye exposure, breathing problems, severe pain, repeated vomiting, or neurological symptoms should not be managed at home.

How long after exposure can complications appear?

Irritation, vomiting, and gas-related symptoms often begin quickly. Burns and swelling may become clearer over several hours. Scar-related swallowing difficulty can develop weeks or months after a serious oesophageal burn.

Sources

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