CONDITION

Sulfuric acid poisoning

Sulfuric acid poisoning is corrosive injury caused by swallowing, breathing, or touching sulfuric acid.

WHAT IT IS
Corrosive injury from contact with sulfuric acid

BODY SYSTEM
Skin, eyes, airways, and digestive tract

MAIN SYMPTOMS
Severe pain, burns, vomiting, breathing difficulty

WHAT CAUSES IT
Swallowing, breathing, or direct contact with sulfuric acid

HOW IT IS DIAGNOSED
Exposure history, examination, blood tests, imaging, and endoscopy

MAIN TREATMENT
Immediate decontamination and hospital supportive care

CAN IT BE CURED?
Sometimes - limited injuries can heal fully

IS IT AN EMERGENCY?
Yes - after swallowing or significant inhalation

LONG-TERM OUTLOOK
Full recovery or lasting damage based on injury depth

Overview

Sulfuric acid is a strong, corrosive chemical used in industry, laboratories, drain cleaners, metal processing, and some vehicle batteries. "Corrosive" means it can destroy tissue on contact.

Poisoning can happen if the acid is swallowed, breathed in as mist, splashed into the eyes, or spilled on the skin. The injury is a chemical burn rather than poisoning that spreads through the body in the usual sense. However, a severe exposure can also cause shock, organ damage, and life-threatening complications.

Concentrated sulfuric acid removes water from tissue and produces heat when mixed with water. This can cause deep burns. Damage may continue beneath the surface even when the visible burn seems small.

Swallowing sulfuric acid or having significant breathing difficulty after exposure is an emergency. Eye exposure also needs immediate irrigation and urgent assessment. Quick decontamination and medical care can limit injury, but there is no specific antidote.

Symptoms

Symptoms usually begin during or soon after exposure. Their location and severity depend on how the contact happened, the concentration, and how much tissue was exposed.

After swallowing sulfuric acid, symptoms can include:

A person can have serious injury to the food pipe or stomach without obvious burns around the mouth. A lack of mouth pain does not rule out deeper damage.

Breathing sulfuric acid mist can irritate or burn the nose, throat, and lungs. It may cause coughing, chest tightness, wheezing, shortness of breath, or a choking feeling. Lung inflammation and fluid buildup can worsen over several hours.

Skin contact may cause redness, severe pain, blisters, or areas of pale, brown, or blackened skin. Concentrated acid can burn deeply.

Eye exposure may cause intense pain, watering, eyelid swelling, blurred vision, or sensitivity to light. Severe burns can injure the clear front surface of the eye, called the cornea, and may threaten vision.

Very serious exposure can lead to confusion, fainting, rapid breathing, low blood pressure, or reduced urine production.

- Burning pain in the mouth, throat, chest, or upper abdomen
- Drooling or difficulty swallowing
- Vomiting, sometimes with blood
- Hoarse voice, coughing, or noisy breathing
- Abdominal swelling or tenderness

Causes and risk factors

Sulfuric acid poisoning is caused by direct exposure to the chemical. It is not an infection and cannot spread from one person to another.

Exposure may occur through:

The risk of severe injury is greater with concentrated acid, longer contact, delayed washing, or

exposure involving a large area. Swallowing and inhalation can be particularly dangerous because internal burns are not fully visible.

Children may be exposed when corrosive products are within reach or transferred out of their original containers. People who work with sulfuric acid face higher exposure risk if ventilation, protective equipment, or handling procedures fail.

- An industrial or laboratory spill
- Contact with battery acid
- Use of a sulfuric acid-containing drain cleaner
- Acid stored in an unlabelled or drink container
- Poor ventilation where acid mist is produced
- Deliberate swallowing or assault

Diagnosis

Diagnosis begins with the exposure history and a careful examination. If it is safe, the product container, label, or safety data sheet can help the poison service and hospital identify the concentration. Do not bring a leaking or contaminated container into an enclosed vehicle or healthcare setting.

The medical team first checks breathing, circulation, alertness, and the extent of visible burns. Blood tests may look for acid-base problems, blood loss, inflammation, kidney injury, or signs of severe tissue damage.

After swallowing, upper endoscopy may be used once the person is stable. During this procedure, a flexible camera is passed through the mouth to examine the food pipe, stomach, and sometimes the first part of the small intestine. It helps show the depth and extent of burns. The timing and safety of endoscopy are decided by the hospital team.

CT imaging may be needed if there is concern about deep tissue death, a hole in the digestive tract, or injury in the chest or abdomen. A hole is called a perforation. Chest X-rays or other imaging may also help assess lung exposure.

After inhalation, doctors may examine the airways with a small camera called a bronchoscope. Eye examination can include checking the eye's acidity and using a dye to reveal corneal damage.

Treatment and management

Treatment starts by stopping contact with the acid without exposing anyone else. Emergency services and a poison information service can give instructions based on the route of exposure.

For skin contact, contaminated clothing and jewellery should be removed while avoiding contact with the chemical. The skin should be rinsed immediately with plenty of running water. Do not scrub the burn or apply creams, baking soda, or another neutralising chemical.

For eye exposure, remove contact lenses if they come out easily and start continuous rinsing with clean, lukewarm water. Do not delay rinsing while waiting for help.

After swallowing, do not cause vomiting. Vomiting brings the acid back over already injured tissue and may allow it into the lungs. Do not try to neutralise it with an alkali such as baking soda. The chemical reaction can release heat and gas, worsening the injury. Activated charcoal does not bind sulfuric acid effectively. A poison specialist should advise whether anything may be taken by mouth.

Someone exposed to fumes should move into fresh air only if this can be done safely. No one should enter a contaminated area without suitable protective equipment.

Hospital treatment may include oxygen, airway support, intravenous fluids, pain relief, and close monitoring. A breathing tube may be placed early if swelling threatens the airway. This is performed by an experienced medical team because damaged tissue can be fragile.

Nutrition may need to be given through a carefully placed feeding tube or into a vein if swallowing is unsafe. Tubes should not be inserted blindly through a severely burned throat or food pipe.

Surgery may be necessary if there is perforation, uncontrolled bleeding, widespread tissue death, or severe abdominal infection. Deep skin burns may require specialist burn care, removal of dead tissue, or skin grafting.

Antibiotics and corticosteroids like prednisone or hydrocortisone are not automatic treatments for every corrosive exposure. They may be used in selected situations based on infection, airway swelling, or the pattern of injury.

Complications

Early complications can include airway swelling, bleeding, lung injury, shock, or perforation of the food pipe or stomach. Leakage through a perforation can cause serious infection in the chest or abdomen.

Damaged tissue can later heal with thick scar tissue. Narrowing of the food pipe, called an oesophageal stricture, may appear over the following weeks or months. It can cause food to stick, painful swallowing, weight loss, or repeated vomiting.

Scarring near the stomach outlet can prevent food from passing normally into the small intestine. Some people need repeated procedures to stretch a narrowed area, long-term nutritional support, or surgery.

Deep skin burns may leave scars, changes in skin colour, or restricted movement across a joint. Eye injury can cause lasting corneal scarring or loss of vision. Severe inhalation injury may leave ongoing breathing problems.

People with major corrosive injury to the food pipe have a higher long-term risk of oesophageal cancer. This risk develops over many years. A digestive specialist can decide whether long-term monitoring is appropriate.

Prevention

Sulfuric acid poisoning is usually preventable by controlling access and avoiding unprotected contact.

Keep products in their original, clearly labelled containers. Never pour sulfuric acid or drain cleaner into a bottle, cup, or food container. Store it locked away from children and separate from incompatible chemicals.

Follow the product label and workplace safety data sheet. Use the ventilation and chemical-resistant eye, face, hand, and body protection required for that specific product and task. Ordinary glasses do not provide full splash protection.

Do not mix drain cleaners or other chemicals. Mixing corrosive products can release heat, spray acid, or produce dangerous gases.

Workplaces should use closed systems, local exhaust ventilation, spill procedures, emergency eyewash stations, and safety showers where sulfuric acid exposure is possible. Workers should know how to reach emergency and poison services.

Living with it and what to expect

The course depends mainly on the concentration, amount, route of exposure, and depth of the burn. A brief, limited skin exposure that is washed promptly may heal without lasting effects. A deep internal burn may require months of treatment.

During early recovery after swallowing, eating can be uncomfortable or unsafe. A dietitian and digestive specialist may help maintain nutrition while injured tissue heals. Any new difficulty swallowing, food sticking, vomiting after meals, or unplanned weight loss needs follow-up because these can be signs of narrowing.

Strictures may need repeated stretching procedures. Some eventually remain open, while others return and require further treatment. Surgery is less common but may be needed for severe or persistent narrowing.

Skin and eye injuries may need rehabilitation, scar treatment, or repeated specialist review. Recovery from a major chemical exposure can also affect sleep, mood, or confidence around work and daily activities. Mental health support can be part of rehabilitation.

Routine follow-up may involve a burn service, eye specialist, lung specialist, surgeon, or digestive specialist. Keeping these appointments is important even when pain has improved, because some complications develop later.

When to get medical help

Call emergency services now after any known or suspected swallowing of sulfuric acid. Do not wait for burns or pain to appear.

Emergency help is also needed for:

Begin rinsing exposed skin or eyes immediately while help is being arranged. If fumes are present, leave the area without putting yourself or anyone else at risk.

Contact a poison information service promptly after any exposure, even if symptoms seem mild. In the United States, Poison Control is available at 1-800-222-1222. Elsewhere, use the local poison centre or emergency service.

After hospital discharge, seek urgent assessment for worsening chest or abdominal pain, fever, breathing difficulty, repeated vomiting, vomiting blood, black stools, or inability to swallow liquids.

Arrange routine follow-up for gradually increasing swallowing difficulty, food sticking, ongoing cough, weight loss, slow-healing burns, scar tightness, or continuing vision changes.

- Trouble breathing, wheezing, choking, or a hoarse voice
- Drooling or inability to swallow
- Vomiting blood or severe chest or abdominal pain
- Fainting, confusion, extreme weakness, or blue-grey lips

- A large, deep, or rapidly changing skin burn
- Any sulfuric acid splash into the eye

Common questions

What should I do immediately after sulfuric acid exposure?

Move away from the source if it is safe. Rinse affected skin or eyes with plenty of water, remove contaminated clothing, and contact emergency or poison services. Swallowing sulfuric acid always needs emergency assessment.

Can water or milk neutralise swallowed sulfuric acid?

They do not neutralise the acid safely. Do not force fluids, especially if the person is vomiting, drowsy, drooling, or having trouble swallowing. Follow instructions from a poison specialist.

Should I make myself vomit after swallowing it?

No. Vomiting exposes the throat and food pipe to the acid again and may draw acid into the lungs.

Can sulfuric acid fumes poison me?

Yes. Sulfuric acid mist can burn the airways and lungs. Coughing, wheezing, chest tightness, or shortness of breath after exposure needs urgent medical assessment.

Is battery acid the same as sulfuric acid?

Many lead-acid vehicle batteries contain diluted sulfuric acid. It can still cause serious skin, eye, breathing, or internal burns.

Can a person fully recover after swallowing sulfuric acid?

Full recovery is possible after a limited injury, but deeper burns can cause permanent scarring, swallowing problems, or organ damage. Early findings and follow-up help clarify the likely course.

Sources

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