CONDITION

Sodium hydroxide poisoning

Sodium hydroxide poisoning is a corrosive injury caused by swallowing, touching, or breathing in sodium hydroxide.

WHAT IT IS
Corrosive injury from sodium hydroxide exposure

BODY SYSTEM
Digestive tract, skin, eyes, and lungs

MAIN SYMPTOMS
Burning pain, drooling, vomiting, breathing difficulty

WHAT CAUSES IT
Contact with corrosive sodium hydroxide

HOW IT IS DIAGNOSED
Exposure history, examination, endoscopy or CT when needed

MAIN TREATMENT
Decontamination, supportive care, and surgery when needed

CAN IT BE CURED?
Sometimes - prompt care can limit injury

IS IT AN EMERGENCY?
Yes - any swallowed amount or serious exposure

LONG-TERM OUTLOOK
Full recovery or lasting problems after deeper burns

Overview

Sodium hydroxide is a strong, corrosive chemical also called lye or caustic soda. It is found in some drain and oven cleaners, industrial products, soap-making supplies, and laboratory chemicals.

Poisoning happens when sodium hydroxide is swallowed, splashed into the eyes, left on the skin, or breathed in as dust or mist. Rather than poisoning the body in the usual sense, it causes a chemical burn. It can rapidly damage tissue by breaking down fats and proteins.

Swallowing sodium hydroxide can burn the mouth, throat, food pipe, and stomach. The food pipe is also called the oesophagus. Serious injury may occur even when the mouth looks normal.

Eye exposure can threaten sight. Skin contact may produce deep burns, while inhaled dust or mist can irritate or burn the airways. The severity is affected by the product's strength, amount, physical form, contact time, and route of exposure.

There is no antidote that reverses sodium hydroxide burns. Immediate first aid and specialist assessment can limit further contact and help manage complications.

Symptoms

Symptoms often begin during or soon after exposure, but the full depth of a burn may not be clear at first. A lack of pain or visible mouth burns does not reliably rule out internal injury.

After swallowing sodium hydroxide, symptoms may include:

Eye exposure can cause severe pain, redness, watering, blurred vision, or difficulty opening the eye. A strong exposure may damage the clear front surface of the eye, called the cornea.

Skin contact may cause redness, burning, blisters, numbness, or areas that look pale, brown, or black. Sodium hydroxide may continue penetrating tissue while it remains on the skin. Pain does not always show how deep the injury is.

Breathing in dust or mist may cause burning in the nose or throat, coughing, chest tightness, wheezing, or breathlessness. More serious airway symptoms can develop if swelling increases.

- Burning pain in the mouth, throat, chest, or abdomen
- Drooling or difficulty swallowing
- Hoarseness, coughing, noisy breathing, or shortness of breath
- Nausea or vomiting, sometimes with blood
- Swelling of the lips, tongue, or throat

Causes and risk factors

The direct cause is contact with sodium hydroxide. Exposure may happen through a household accident, a workplace incident, unsafe storage, a product splash, or an error while using concentrated lye for cleaning or soap making.

Risk is higher when the product is concentrated or remains in contact with tissue for longer. Solid pellets or flakes can stick to damp skin or eyes and then dissolve. This releases heat as well as creating a highly alkaline solution, which can worsen the burn.

Children may swallow products stored in drink bottles or unlocked cupboards. Adults may be

exposed while clearing blocked drains, handling industrial chemicals, or mixing solutions without suitable protection.

Intentional swallowing can cause extensive injury and is both a medical and mental health emergency. Emergency care should address immediate safety as well as the chemical exposure.

Diagnosis

Diagnosis begins with the exposure history and an examination. Healthcare professionals need to know the product name, concentration if known, route of exposure, approximate amount, and time it happened. Bring the container or a photograph of its label if this can be done safely.

After swallowing, blood tests can show dehydration, blood loss, changes in body chemistry, or signs of serious tissue injury. Chest or abdominal imaging may look for air outside the digestive tract, which can suggest a hole called a perforation.

An upper endoscopy may be used to assess the food pipe and stomach. During this procedure, a flexible camera is passed through the mouth. It helps specialists judge the depth and extent of the burns. It is normally arranged within a controlled hospital setting and may be unsafe if perforation is already suspected.

A CT scan can help identify deep damage, dead tissue, or perforation and may guide decisions about surgery.

Eye exposure is assessed with a detailed eye examination. This may include checking the eye's acidity, examining it under magnification, and using a dye to reveal damage to the cornea.

Treatment and management

If exposure has just happened, contact a poison information service immediately. In the United States, Poison Control is available at 1-800-222-1222. Elsewhere, use your local poison centre or emergency service. Do not wait for symptoms after swallowing sodium hydroxide.

For skin or eye exposure, begin rinsing immediately with plenty of lukewarm running water. Remove contaminated clothing and jewellery while rinsing. If dry powder or pellets are present, carefully brush them away first without touching them with bare hands. Remove contact lenses if they come out easily, but do not delay irrigation.

After swallowing, rinse the mouth gently and spit out the water. Do not make the person vomit. Vomiting exposes the food pipe and mouth to the chemical again.

Do not try to neutralise sodium hydroxide with vinegar, lemon juice, or another acid. The reaction may release heat and cause more damage. Activated charcoal does not effectively bind sodium hydroxide and can interfere with assessment. Do not give food or drink unless a poison specialist or emergency professional specifically advises it.

Hospital treatment may include:

Swelling around the airway can make breathing difficult. A breathing tube may need to be placed early if the airway appears at risk.

Antibiotics and steroid medicines are not routine treatments for every exposure. Specialists may use them in selected circumstances, such as infection, perforation, or particular airway or digestive injuries.

Later treatment may be needed if scar tissue narrows the food pipe. A specialist can sometimes stretch the narrowed area during endoscopy. Severe or repeated narrowing may require reconstructive surgery.

- Support for breathing, circulation, pain, and hydration
- Continued washing of exposed skin or eyes
- Endoscopy or imaging to assess internal burns
- Nutrition through a tube or vein while swallowing is unsafe
- Surgery for perforation, dead tissue, or other severe damage

Complications

A deep burn can cause bleeding or a hole in the food pipe or stomach. Material may then leak into the chest or abdomen, causing serious inflammation and infection. Severe injury may also lead to shock or damage to nearby organs.

Airway swelling can interfere with breathing. Lung complications may develop if vomit or chemical material enters the lungs.

Over the following weeks or months, healing tissue may form a tight scar called a stricture. An oesophageal stricture can make food feel stuck and may cause choking, vomiting, weight loss, or repeated chest infections from food entering the airway.

Eye burns may cause corneal scarring, raised pressure inside the eye, persistent dryness, or loss of vision. Deep skin burns can leave scars or restrict movement near a joint.

People who have had a severe caustic injury to the food pipe have an increased risk of oesophageal cancer many years later. The absolute risk for an individual cannot be judged

from the exposure alone. Long-term follow-up is planned according to the depth and location of injury.

Prevention

Most sodium hydroxide exposures can be prevented.

Keep products in their original, labelled containers. Never transfer drain cleaner or lye into a cup, bottle, or food container. Store it locked away from children and separate from food and medicines.

Read the product instructions before use. Wear the eye, skin, and clothing protection stated on the label. Work in a ventilated area and avoid creating dust or mist.

When preparing a lye solution, follow the manufacturer's process exactly. Adding water to concentrated sodium hydroxide can generate intense heat and splashing. Do not mix it with acids, household cleaners, or other chemicals.

Workplaces should provide chemical training, suitable protective equipment, accessible eyewash facilities, and a plan for spills and exposures.

Living with it and what to expect

The course depends mainly on how deeply the chemical damaged the tissue. A brief skin exposure that was washed off quickly may heal without lasting effects. Deeper digestive, eye, or skin burns can require months of treatment.

After a swallowing injury, pain and swelling may settle before the tissue has fully healed. Follow the hospital's eating and drinking plan. Some people need temporary liquid nutrition or tube feeding while the food pipe recovers.

Strictures usually become apparent during healing rather than at the moment of exposure. Repeated endoscopic stretching may improve swallowing, although narrowing can return. More extensive injuries sometimes require surgery and long-term nutrition support.

Tell the follow-up team about food sticking, coughing during meals, vomiting after eating, or unplanned weight loss. These symptoms need assessment but are not always an emergency if you can breathe and swallow liquids.

Recovery can also affect mood, sleep, work, and confidence around eating. Rehabilitation may involve digestive specialists, dietitians, eye or burn teams, speech and swallowing therapists, and mental health support.

Many people with limited injuries recover fully. Severe burns can leave lasting swallowing, vision, breathing, or scarring problems. Follow-up is based on the organs affected and the findings from endoscopy, imaging, or eye examinations.

When to get medical help

Any swallowed sodium hydroxide requires immediate advice from a poison centre and emergency medical assessment, even if there are no visible burns. Eye exposure also needs immediate irrigation and urgent professional assessment.

Call emergency services now if there is:

Move away from dust or mist into fresh air without entering an unsafe area. Seek urgent help for coughing, wheezing, chest tightness, or breathlessness.

After discharge, keep planned follow-up appointments. Contact the treating service promptly if swallowing becomes harder, food sticks, vomiting continues, weight is falling, a burn appears infected, or pain is getting worse.

If the exposure was intentional, call emergency services and stay with the affected person if it is safe to do so. Immediate medical and mental health support is important.

- Trouble breathing, noisy breathing, or increasing throat swelling
- Collapse, confusion, a seizure, or difficulty waking
- Severe chest or abdominal pain
- Vomiting blood or passing black, tar-like stool
- A large, deep, or widespread skin burn
- Sudden or worsening loss of vision

Common questions

What should I do if I swallowed drain cleaner containing sodium hydroxide?

Rinse your mouth, spit out the water, and contact a poison centre or emergency service immediately. Do not vomit, eat, drink, or try to neutralise the chemical unless a poison specialist tells you to do so.

Can sodium hydroxide poisoning be cured?

Some people recover fully, especially after limited exposure and rapid treatment. A deep chemical burn cannot always be reversed and may leave scarring, narrowing, or organ damage.

How quickly do symptoms start?

Burning and pain often start immediately, but some serious effects develop as swelling or tissue damage progresses. Do not use the absence of early symptoms as proof that swallowing was harmless.

Can my food pipe be burned if my mouth looks normal?

Yes. Visible mouth burns do not reliably show whether the food pipe or stomach is injured. Hospital assessment may include endoscopy or CT imaging.

Why should I not neutralise lye with vinegar?

Mixing a strong alkali with an acid can produce heat and worsen the burn. It may also cause splashing or vomiting. Immediate irrigation for skin or eye contact is safer.

Can sodium hydroxide fumes cause poisoning?

Sodium hydroxide does not readily form a gas, but dust, droplets, or mist can be inhaled. These can burn the nose, throat, and airways. Breathing symptoms require urgent assessment.

Sources

- Agency for Toxic Substances and Disease Registry. Medical Management Guidelines for Sodium Hydroxide
- MedlinePlus Medical Encyclopedia. Sodium hydroxide poisoning
- National Institute for Occupational Safety and Health. NIOSH Pocket Guide to Chemical Hazards: Sodium hydroxide
- Chirica M, et al. Esophageal emergencies: WSES guidelines. World Journal of Emergency Surgery. 2019;14:26
- Bonavina L, et al. Foregut caustic injuries: results of the World Society of Emergency Surgery consensus conference. World Journal of Emergency Surgery. 2015;10:44