CONDITION

Carbolic acid poisoning

Learn how carbolic acid, also called phenol, can affect the skin and internal organs, what to do after an exposure, and how poisoning is treated.

WHAT IT IS
Poisoning from corrosive phenol exposure

BODY SYSTEM
Skin and multiple internal organs

MAIN SYMPTOMS
Chemical burns, breathing problems, seizures, loss of consciousness

WHAT CAUSES IT
Phenol exposure

HOW IT IS DIAGNOSED
Exposure history, physical examination, laboratory tests

MAIN TREATMENT
Decontamination and supportive emergency care

CAN IT BE CURED?
Sometimes - depends on exposure severity

IS IT AN EMERGENCY?
Sometimes - trouble breathing, collapse or seizure

LONG-TERM OUTLOOK
Variable, with possible lasting tissue and organ damage

Overview

Carbolic acid is another name for phenol , a corrosive and poisonous chemical. Phenol is used to make plastics, resins, disinfectants, medicines, and other products. It may also be present in some laboratory, industrial, and medical settings.

Carbolic acid poisoning can happen when phenol is swallowed, inhaled, or absorbed through the skin. Eye contact can cause serious injury. Phenol can damage tissue where it touches the body and can enter the bloodstream quickly, especially through the skin.

Once absorbed, phenol can affect the brain, heart, lungs, kidneys, and liver. A large exposure may cause seizures, abnormal heart rhythms, breathing problems, low blood pressure, or loss of consciousness. Concentrated phenol can also produce deep chemical burns.

A phenol burn may not be very painful at first because phenol can numb nerve endings. A person should not use the amount of pain to judge how serious the exposure is.

Suspected carbolic acid poisoning needs immediate expert guidance. In the United States, call Poison Control at 1-800-222-1222 . Outside the United States, contact the local poison center or emergency service. Call emergency services now if the person has trouble breathing, collapses, has a seizure, or cannot be awakened.

Symptoms

Symptoms depend on how the exposure happened, the phenol concentration, the amount involved, and how long it remained in contact with the body. Effects may begin quickly, but some organ injuries can become clearer over the following hours.

Skin exposure may initially cause pale, white, or waxy-looking areas. The skin may later become red, brown, swollen, or blistered. Affected tissue can be numb or only mildly painful despite a significant burn. Phenol absorbed through a large area of skin can cause whole-body poisoning.

Eye exposure may cause tearing, redness, pain, light sensitivity, blurred vision, or damage to the surface of the eye. Any eye exposure requires prompt irrigation and urgent medical assessment.

Breathing phenol vapor or mist may irritate the nose, throat, and lungs. Symptoms can include coughing, choking, chest tightness, shortness of breath, headache, dizziness, or weakness. Serious exposure may lead to fluid in the lungs and respiratory failure.

Swallowing phenol can burn the mouth, throat, esophagus, and stomach. Symptoms may include drooling, mouth or abdominal pain, vomiting, difficulty swallowing, or vomiting blood. Because phenol may numb tissue, visible pain or mouth burns do not reliably show the full extent of internal injury.

Signs that phenol has affected the whole body may include:

Dark urine may result from phenol breakdown products, dehydration, blood, or muscle injury. Medical testing is needed to identify the cause.

- Confusion, agitation, unusual sleepiness, or loss of consciousness
- Tremors or seizures
- Fast, slow, or irregular heartbeat
- Weakness, fainting, or low blood pressure

- Rapid or difficult breathing
- Reduced urine output or dark-colored urine
- Bluish or gray skin or lips from impaired oxygen delivery
- Yellowing of the skin or eyes from liver injury

Causes and risk factors

Poisoning most often follows accidental or occupational contact with phenol-containing chemicals. It can also result from unsafe storage, incorrect product use, spills, or intentional ingestion.

People who manufacture or handle resins, plastics, coatings, disinfectants, or laboratory chemicals may face a higher risk. Workplace controls, ventilation, protective clothing, chemical-resistant gloves, eye protection, and emergency washing equipment help reduce this risk.

Medical professionals sometimes use carefully controlled phenol products for specific procedures, such as treating part of a toenail growth area or performing certain chemical peels. Poisoning can occur if a concentrated product is used incorrectly, spilled, or applied over too large an area. These procedures should only be performed by trained professionals using appropriate safeguards.

Factors that can increase the seriousness of an exposure include:

Rescuers may also be exposed through contaminated clothing, liquid, or vomit. Anyone helping should avoid direct contact and follow instructions from emergency personnel or a poison center.

- A concentrated product or a large amount
- Prolonged skin contact or delayed removal of contaminated clothing
- Contact with a large skin area
- Exposure involving damaged skin
- Swallowing phenol or breathing concentrated vapor
- Exposure in a poorly ventilated or enclosed space
- Young age or a smaller body size
- Existing heart, lung, kidney, or liver disease

Diagnosis

Clinicians diagnose carbolic acid poisoning using the exposure history, symptoms, physical examination, and laboratory testing. If possible, the product container, label, or safety data sheet should go with the person to the hospital. Do not bring a leaking or contaminated item into an enclosed vehicle.

The medical team will ask what product was involved, its concentration, how the exposure occurred, when it happened, and what first aid was given. They will examine the skin, eyes, mouth, breathing, circulation, and nervous system.

Testing may include an electrocardiogram, or ECG, to check heart rhythm. Blood tests may assess oxygen and acid balance, electrolytes, blood cell counts, kidney function, liver function, and muscle injury. Urine testing can help evaluate kidney effects and the cause of dark urine.

A chest X-ray or other imaging may be needed if there are breathing symptoms. After swallowing phenol, specialists may consider a camera examination of the esophagus and stomach, called endoscopy, to look for internal burns. The timing and need for this examination depend on the person's condition.

Phenol levels are not routinely available and usually do not guide immediate treatment. Treatment should not be delayed while waiting for a specialized test.

Treatment and management

The first priority is to stop the exposure without putting anyone else at risk. Move away from fumes only if this can be done safely. Do not enter a contaminated enclosed area without proper protective equipment.

For skin contact, remove contaminated clothing and jewelry while avoiding contact with the chemical. Immediately rinse the affected skin with plenty of lukewarm running water. A poison center or hazardous-materials team may recommend additional decontamination based on the product. Do not scrub the skin or apply household solvents, creams, or neutralizing chemicals.

For eye exposure, remove contact lenses if they come out easily and rinse the eye continuously with clean, lukewarm water. Do not put drops or chemicals in the eye unless a medical professional directs you to do so.

If phenol was swallowed, do not make the person vomit. Do not try to neutralize it with another chemical. Do not give food, drink, or activated charcoal unless a poison center or clinician specifically recommends it. A drowsy, vomiting, or seizing person should never be given anything by mouth.

Emergency treatment focuses on supporting breathing and circulation while limiting further absorption. Care may include oxygen, assisted ventilation, intravenous fluids, and medicines to support blood pressure. Clinicians continuously monitor heart rhythm, oxygen levels, temperature, and urine output.

Seizures and dangerous heart rhythms are treated using established emergency-care methods. Severe acid buildup in the blood, abnormal electrolytes, or problems with oxygen delivery are corrected according to laboratory findings. There is no widely accepted specific antidote that reverses phenol poisoning.

Chemical burns may need ongoing wound care and assessment by burn, surgical, eye, or skin specialists. Dead tissue sometimes requires removal. Eye injuries need prompt evaluation because surface damage may affect vision.

A person who has swallowed phenol may need treatment from toxicology and digestive-system specialists. Routine stomach emptying is generally avoided because it can expose the esophagus to the chemical again and may cause aspiration into the lungs.

The observation period depends on the route and seriousness of exposure, symptoms, test results, and product concentration. People with significant exposures may need care in an intensive care unit.

Complications

Phenol can cause both local tissue injury and damage after it enters the bloodstream. The risk depends on the amount absorbed and how quickly decontamination and supportive treatment begin.

Possible complications include:

After ingestion, scar tissue may gradually narrow the esophagus. This can lead to difficulty swallowing, food sticking, pain with swallowing, or weight loss. These symptoms need medical review even if they develop weeks after the initial exposure.

Some people also have emotional distress after a severe accident. If the exposure was intentional, the care team can arrange mental health support and a safety assessment as part of treatment.

- Deep skin burns, tissue death, infection, or scarring
- Corneal injury and lasting vision problems
- Swelling or burns of the airway

- Chemical pneumonia or fluid in the lungs
- Seizures, coma, or other brain effects
- Abnormal heart rhythms and circulatory shock
- Breakdown of red blood cells or impaired oxygen delivery
- Acute kidney injury
- Liver injury
- Muscle breakdown
- Narrowing of the esophagus after a severe internal burn

Follow up

Follow-up is based on the type and severity of exposure. A small exposure that remains symptom-free may only require poison-center guidance, while a burn, eye exposure, ingestion, or systemic illness usually needs medical follow-up.

Clinicians may repeat kidney, liver, blood, or urine tests after a significant exposure. Burn follow-up can assess healing, infection, scarring, sensation, and movement around joints. An eye specialist may monitor vision and healing after eye contact.

After swallowing phenol, report new or worsening trouble swallowing, repeated vomiting, chest pain, abdominal pain, or unintended weight loss. These may require evaluation for delayed injury or narrowing of the esophagus.

Seek urgent medical care for worsening pain, spreading redness, fever, reduced urination, increasing weakness, or new breathing problems. Call emergency services for severe breathing difficulty, collapse, seizure, confusion, blue or gray lips, or inability to wake the person.

Before returning to a workplace where phenol is used, review the incident with occupational health or workplace safety staff. The review may identify a need for better ventilation, protective equipment, storage practices, spill procedures, or training.

Sources

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