CONDITION

Acid soldering flux poisoning

Learn how acid soldering flux can harm the mouth, lungs, skin, eyes, and internal organs, and what to do after a possible exposure.

WHAT IT IS
Corrosive poisoning from acid soldering flux exposure

BODY SYSTEM
Digestive and breathing systems, skin and eyes

MAIN SYMPTOMS
Burning pain, difficulty swallowing, vomiting, breathing difficulty

WHAT CAUSES IT
Swallowing, inhaling or contact with acid flux

HOW IT IS DIAGNOSED
Exposure history, examination, endoscopy or imaging

MAIN TREATMENT
Decontamination and supportive hospital care

CAN IT BE CURED?
Sometimes - limited exposures can fully resolve

IS IT AN EMERGENCY?
Sometimes - severe breathing difficulty or collapse

LONG-TERM OUTLOOK
Full recovery after limited exposure, lasting damage after major injury

Overview

Acid soldering flux poisoning happens when someone swallows, inhales, or has significant skin or eye contact with an acidic soldering product. Flux is used to clean metal surfaces and help solder bond. Acid flux is often used for plumbing, sheet metal work, and other applications that need strong cleaning action.

The exact ingredients vary by product. Common components include zinc chloride, ammonium chloride, hydrochloric acid, or mixtures of acidic and metal-containing chemicals. These substances can burn tissue on contact. Heating the flux may also release irritating or corrosive fumes.

Swallowing acid flux can injure the mouth, throat, esophagus, stomach, and sometimes the intestines. The esophagus is the tube that carries food from the mouth to the stomach. Serious

exposure can also affect breathing, blood pressure, the kidneys, or other organs. Inhaling fumes may injure the nose, throat, and lungs. Skin or eye contact can cause chemical burns.

Acid soldering flux is different from rosin-based or "no-clean" flux, although fumes from those products may also irritate the airways. The solder itself is another material and may contain metals such as lead or tin. A product label or safety data sheet can help identify the specific substances involved.

A possible swallowing exposure should be treated as urgent even when symptoms seem mild. The amount of damage is not always clear from burns visible in the mouth. In the United States, call Poison Help at 1-800-222-1222 for immediate guidance. Call emergency services if the person has trouble breathing, collapses, has a seizure, is difficult to wake, or has other severe symptoms.

Symptoms

Symptoms depend on the product, route of exposure, amount, concentration, and length of contact. They may begin right away, but some breathing or digestive complications can appear later.

After swallowing acid soldering flux, symptoms may include:

Severe corrosive injury can cause a hole, called a perforation, in the esophagus or stomach. Possible signs include sudden or worsening chest or abdominal pain, a rigid abdomen, fever, rapid heart rate, or severe weakness. These symptoms require emergency care.

Inhaling fumes may cause burning of the nose or throat, coughing, chest tightness, wheezing, headache, or shortness of breath. A large exposure can cause lung inflammation and fluid buildup. Breathing symptoms that persist, worsen, or appear after leaving the work area need prompt medical assessment.

Skin contact may cause redness, pain, blisters, or a chemical burn. Eye exposure can cause severe pain, tearing, redness, blurred vision, or sensitivity to light. Any ongoing eye pain or vision change after rinsing needs urgent evaluation.

- Burning or pain in the mouth, throat, chest, or abdomen
- Redness, swelling, or sores around the lips and mouth
- Drooling or difficulty swallowing
- Hoarseness or a change in voice
- Nausea, vomiting, or vomiting blood

- Coughing, choking, or noisy breathing
- Abdominal tenderness
- Dizziness, weakness, confusion, or fainting

Causes and risk factors

Poisoning most often results from accidental swallowing, breathing concentrated fumes, or spilling the product onto the skin or eyes. Acid flux stored in an unlabeled cup or drink container can be mistaken for a beverage. Children may be exposed when products are left within reach.

Heating acid flux in a poorly ventilated area increases the chance of inhaling fumes. Workers and hobbyists involved in plumbing, metal repair, roofing, stained glass, or other soldering tasks may have repeated opportunities for exposure. Risk can rise when people do not use the ventilation, eye protection, gloves, or respiratory controls listed on the product's safety data sheet.

The severity of an exposure may be greater when the product is concentrated, a large amount is swallowed, fumes build up in an enclosed area, or contaminated clothing remains against the skin. Existing lung disease may make breathing symptoms harder to tolerate, but anyone can be seriously affected by a concentrated exposure.

Intentional ingestion is a medical emergency. In addition to treatment for poisoning, the healthcare team can provide confidential mental health support and help address immediate safety.

Diagnosis

Diagnosis begins with the exposure history and a physical examination. Clinicians will ask what happened, when it occurred, how the person was exposed, and what symptoms are present. They may contact a poison center or medical toxicologist, a physician who specializes in harmful chemical and medication exposures.

If possible, bring the original container or a clear photograph of the label. The product name, ingredients, concentration, and safety data sheet can guide care. Do not delay emergency treatment to search for this information.

The medical team will check breathing, oxygen level, heart rate, blood pressure, mental alertness, and signs of burns. The absence of visible mouth burns does not fully rule out injury

deeper in the digestive tract.

Depending on the exposure, testing may include blood tests to check electrolytes, acid-base balance, kidney function, liver function, and blood cell counts. A chest X-ray or computed tomography scan may be used when there is concern about aspiration, lung injury, or a perforation. Aspiration means that liquid or vomit entered the airways.

After a significant swallowing exposure, specialists may perform an upper endoscopy. During this procedure, a flexible camera is passed through the mouth to examine the esophagus and stomach. Endoscopy is not appropriate in every case. Its timing and safety depend on symptoms, examination findings, and whether a perforation is suspected.

Treatment and management

Immediate first aid depends on the route of exposure.

After swallowing acid flux, do not make the person vomit. Vomiting exposes the esophagus and mouth to the chemical again and may allow it to enter the lungs. Do not try to neutralize the product with baking soda, vinegar, or another substance. The reaction can create heat and worsen tissue injury.

Rinse the mouth gently. Contact a poison center immediately for instructions about whether anything should be taken by mouth. Do not force fluids or give food to someone who is vomiting, drowsy, having a seizure, or having trouble swallowing.

For inhaled fumes, move into fresh air if this can be done without entering a dangerous area. Do not attempt a rescue in an enclosed space unless properly trained and equipped. Persistent coughing, chest tightness, or breathing difficulty needs urgent medical care.

For skin contact, remove contaminated clothing and rinse the skin with plenty of running water. For eye exposure, remove contact lenses if they come out easily and begin continuous gentle rinsing with clean lukewarm water. Poison-control or emergency professionals can advise how long to continue irrigation. Do not put neutralizing chemicals or unapproved drops into the eye.

Hospital treatment is based on the injuries found rather than on a single antidote. Care may include oxygen, airway protection, intravenous fluids, pain and nausea control, and close monitoring. A breathing tube may be needed if swelling threatens the airway. Clinicians may treat wheezing or lung inflammation and monitor for delayed breathing problems.

After ingestion, food and drink may be withheld until swallowing safety and the degree of digestive injury are assessed. Endoscopy or imaging can help guide nutrition and further treatment. Severe burns, uncontrolled bleeding, or a perforation may require surgery.

Antibiotics like amoxicillin or doxycycline , steroids like prednisone or hydrocortisone , and other medicines are not automatically appropriate for every caustic exposure; specialists decide whether they are needed based on specific findings.

Activated charcoal does not reliably treat corrosive injury and may interfere with evaluation or increase the risk of vomiting. It should not be used at home unless a poison specialist specifically directs it.

Complications

Many limited exposures resolve without lasting injury, especially when decontamination and medical guidance occur promptly. More concentrated exposures can cause complications during the first hours or days.

Possible early complications include airway swelling, aspiration, pneumonia, lung inflammation, internal bleeding, shock, and perforation of the esophagus or stomach. A perforation can lead to serious infection in the chest or abdomen. Some formulations may also contribute to abnormal body chemistry or kidney, liver, or blood-cell injury.

As burns heal, scar tissue may narrow the esophagus. This narrowing is called an esophageal stricture. It can cause food to stick, painful swallowing, regurgitation, vomiting, or weight loss. Treatment may involve procedures that gradually stretch the narrowed area and support adequate nutrition.

Severe eye exposure can damage the cornea, the clear front surface of the eye. Deep skin burns may heal slowly or leave scars. Significant inhalation injury can lead to prolonged cough or reduced lung function.

People with major caustic injury to the esophagus may need long-term specialist care. The follow-up plan depends on the location and depth of injury rather than on the product name alone.

Follow up

Follow the discharge instructions from the emergency department, poison center, or toxicology team. People with a minor exposure and no symptoms may only need observation or a scheduled check-in. Those with burns, abnormal tests, breathing symptoms, or swallowing problems may need follow-up with gastroenterology, lung, eye, burn, surgery, or toxicology specialists.

At routine follow-up, tell the clinician about pain with swallowing, food sticking, repeated

vomiting, reduced appetite, weight loss, cough, or shortness of breath. These symptoms may point to healing problems that need assessment.

Seek urgent medical care for new or worsening trouble swallowing, repeated vomiting, fever, increasing chest or abdominal pain, coughing after eating, reduced urination, or worsening breathing symptoms.

Call emergency services for severe breathing difficulty, blue or gray lips, collapse, confusion, a seizure, vomiting blood, sudden severe chest or abdominal pain, or inability to stay awake.

To prevent another exposure, keep flux in its original labeled container. Never store it in a food or drink container. Follow the safety data sheet, use suitable local exhaust ventilation, and wear the recommended eye and skin protection. Store chemicals securely away from children.

Sources

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