CONDITION

Tetrahydrozoline poisoning

Tetrahydrozoline poisoning is a toxic reaction that can occur when redness-relief eye drops are swallowed or used excessively.

WHAT IT IS
Toxic reaction from tetrahydrozoline exposure

BODY SYSTEM
Nervous system, heart and circulation, and breathing

MAIN SYMPTOMS
Sleepiness, slow heartbeat, low blood pressure, slowed breathing

WHAT CAUSES IT
Swallowing or excessive use of tetrahydrozoline products

HOW IT IS DIAGNOSED
Exposure history and matching clinical findings

MAIN TREATMENT
Supportive hospital care and close heart-breathing monitoring

CAN IT BE CURED?
Yes - effects usually wear off

IS IT AN EMERGENCY?
Yes - any suspected swallowing or severe drowsiness

LONG-TERM OUTLOOK
Full recovery common after acute effects resolve

Overview

Tetrahydrozoline poisoning is a harmful reaction to tetrahydrozoline, a medicine found in some over-the-counter eye drops used to reduce redness. Products and ingredients differ by country, so the package label is the best way to check whether a product contains it.

Tetrahydrozoline narrows small blood vessels on the eye's surface. This makes the eye look less red. It belongs to a group of medicines called imidazolines, which can also affect the brain, heart rate, blood pressure, body temperature, and breathing.

Poisoning most often happens when the liquid is swallowed. A small amount may cause serious effects in a young child because eye-drop bottles contain medicine intended for use only in the eyes. Poisoning can also follow deliberate ingestion or, less often, excessive use.

Symptoms can resemble poisoning by opioids or certain blood pressure medicines. Prompt advice from a poison centre is important because someone who initially seems well may become very sleepy or develop changes in breathing, heart rate, or blood pressure.

Symptoms

Symptoms usually begin relatively soon after exposure, often within the first few hours. Their timing and severity are influenced by the amount, the product's strength, how the exposure happened, and the person's age and health.

Possible symptoms include:

Blood pressure may occasionally rise early in the poisoning before becoming low. The heartbeat may also become irregular. Severe poisoning can cause loss of consciousness, pauses in breathing, or collapse.

When eye drops are used as directed, brief stinging or blurred vision may occur without systemic poisoning. However, unusual drowsiness, weakness, breathing changes, or fainting after use are not expected and need urgent assessment.

Children may become suddenly quiet, floppy, pale, or difficult to wake. These changes can be mistaken for normal sleep, so any suspected swallowing should be taken seriously even if no symptoms are present yet.

- Marked sleepiness, weakness, confusion, or difficulty waking
- Slow or shallow breathing
- A slow heartbeat
- Low blood pressure, dizziness, or fainting
- Small pupils
- Pale, cool, or sweaty skin
- Low body temperature
- Nausea or vomiting

Causes and risk factors

Tetrahydrozoline poisoning occurs when enough medicine enters the bloodstream to affect the brain and circulation. Swallowing the liquid is the main cause.

Common situations include a child opening or drinking from an eye-drop bottle, medicine being stored within reach, or the product being mistaken for another liquid. Child-resistant packaging lowers risk but does not make a container childproof.

Other possible causes include deliberately swallowing the medicine, giving it to another person without their knowledge, or using much more than the label directs. Repeated or very frequent eye use may increase absorption, especially if the eye surface is damaged, although severe poisoning is much more closely linked to swallowing.

Young children have a higher risk of serious effects from a small volume. Older adults and people with heart, breathing, or circulation problems may also be more vulnerable to complications.

Using redness-relief drops frequently can cause rebound redness. This means the eyes become red again, sometimes more noticeably, as the medicine wears off. Rebound redness is different from systemic poisoning, but it can lead to increasingly frequent use.

Diagnosis

There is no routine bedside test that proves tetrahydrozoline poisoning. Diagnosis is usually based on the exposure history, the product label, symptoms, and examination findings.

If possible, take the bottle or packaging to the emergency department. The product name, active ingredient, strength, estimated amount missing, time of exposure, and any other medicines involved can help guide care. Do not delay emergency help while looking for this information.

The healthcare team may repeatedly check alertness, breathing, temperature, heart rate, blood pressure, and oxygen level. An electrocardiogram, also called an ECG or EKG, records the heart's electrical activity and can identify a slow or irregular rhythm.

Blood tests may check blood sugar, salts, kidney function, and other possible causes of reduced consciousness. These tests assess the person's condition rather than confirming tetrahydrozoline itself. Special toxicology testing may sometimes detect the drug, but it is not widely available and is rarely fast enough to guide immediate treatment.

Clinicians may also consider other causes with similar signs, including opioid exposure, clonidine poisoning, low blood sugar, infection, or a neurological problem. A response or lack of response to one treatment does not by itself prove the cause.

Treatment and management

Suspected swallowing requires immediate advice from a poison centre or emergency service. Do not wait for symptoms to develop. In the United States, Poison Help is available at 1-800-222-1222. Elsewhere, use the local poison information service or emergency number.

Do not make the person vomit. Do not give food, drink, activated charcoal, or a home remedy unless a poison specialist specifically recommends it. If the person is very sleepy, giving anything by mouth could cause choking.

There is no established antidote that reliably reverses tetrahydrozoline poisoning. Treatment focuses on supporting breathing and circulation while the body clears the medicine.

Hospital care may include:

Activated charcoal is considered only in selected recent ingestions when specialists judge that it can be given safely. It can enter the lungs if someone is drowsy, so it should never be used at home.

Naloxone, the antidote for opioid poisoning, has sometimes been tried because tetrahydrozoline poisoning can look similar. Reports of benefit are inconsistent, and naloxone is not a specific antidote for tetrahydrozoline. Emergency teams may still use it when opioid exposure is possible.

Observation continues until alertness, breathing, heart rate, blood pressure, and temperature remain stable. Someone with significant symptoms may need intensive monitoring.

- Continuous monitoring of heart rate, blood pressure, breathing, and oxygen
- Oxygen or breathing support when needed
- Fluids through a vein for low blood pressure
- Medicines to support blood pressure or heart rate in severe cases
- Treatment for low body temperature or low blood sugar

Complications

Most people recover with timely supportive care, but severe poisoning can interfere with breathing and the delivery of oxygen to the body.

Possible complications include aspiration, in which vomit or liquid enters the lungs; dangerously low blood pressure; abnormal heart rhythms; respiratory failure; coma; and injury caused by prolonged lack of oxygen. Death is possible, although it is not the usual outcome when exposure is recognised and treated promptly.

Falls or accidents may occur if dizziness or sudden drowsiness develops. Repeated hidden or

deliberate exposure can cause recurring unexplained episodes and delay recognition of the cause.

Complications are more likely when a large amount is swallowed, treatment is delayed, more than one substance is involved, or the person already has serious heart or breathing problems.

Prevention

Most accidental tetrahydrozoline poisoning can be prevented. Store eye drops like any other medicine, not like a harmless personal-care product.

Keep products in their original labelled containers, secured out of sight and reach of children. Close the cap immediately after each use. Do not leave bottles in handbags, bedside drawers, vehicles, or other places children may explore.

Never put eye drops into food, drinks, or an unlabelled container. Do not share them or give them to someone without their knowledge. Follow the package directions and avoid using more in an attempt to clear persistent redness.

Ongoing red eyes may have another cause, such as dry eye, allergy, irritation, infection, or inflammation. Routine medical or eye-care review is appropriate if redness keeps returning, if you feel reliant on redness-relief drops, or if the label's recommended period of use has passed.

Safe disposal matters because a partly used bottle may still contain enough medicine to cause poisoning. Follow local medicine take-back or disposal instructions.

Living with it and what to expect

Tetrahydrozoline poisoning is usually a short-term event rather than a chronic condition. Symptoms often improve as the medicine is cleared, but the time needed can differ. Significant effects may continue for many hours and sometimes longer, so discharge is based on stable symptoms and observations rather than a fixed timetable.

Most people who recover without a prolonged breathing or circulation problem do not have lasting effects. Long-term disability is more likely only if severe poisoning causes complications such as extended oxygen deprivation.

After discharge, temporary tiredness may remain. Follow the instructions given by the treating team about rest, supervision, and returning to normal activities. New drowsiness, fainting, breathing difficulty, or confusion after discharge needs urgent reassessment.

A routine follow-up may be advised when the exposure resulted from frequent eye-drop use, confusion about medicines, unsafe storage, or an unexplained episode. Persistent eye redness should be assessed separately because tetrahydrozoline only reduces the appearance of redness; it does not treat every underlying cause.

If the exposure was intentional, emotional and mental health support is an important part of recovery. If someone was given the product without consent, tell the treating team and consider contacting local safeguarding or law-enforcement services when safe to do so.

When to get medical help

Treat any known or suspected swallowing of tetrahydrozoline as urgent, even when there are no symptoms. Contact a poison centre immediately. Do not wait to see whether the person becomes unwell.

Call emergency services now if the person:

If the person is unconscious but breathing, place them on their side if you can do so safely. If they are not breathing normally, begin CPR if you are able and follow the emergency dispatcher's instructions.

Routine follow-up, rather than emergency care, is appropriate for recurring eye redness or increasing reliance on redness-relief drops when there has been no swallowing and no whole-body symptoms. Eye pain, light sensitivity, injury, sudden vision change, or thick discharge requires prompt eye assessment because these signs may point to another condition.

- Is difficult to wake, collapses, or has a seizure
- Has slow, shallow, irregular, or stopped breathing
- Faints or develops blue, grey, or very pale skin
- Has severe weakness, confusion, or loss of consciousness
- May have swallowed tetrahydrozoline deliberately
- May have been given it without their knowledge

Common questions

Can swallowing eye drops really be dangerous?

Yes. Eye drops contain concentrated medicine intended for very small amounts on the eye.

When swallowed, tetrahydrozoline can affect the brain, heart, blood pressure, temperature, and breathing. Young children can become seriously unwell after an amount that may not look large.

How quickly does tetrahydrozoline poisoning start?

Symptoms often begin within the first few hours and may appear sooner. Because there can be a delay, a person should not be assumed safe simply because they initially look well. Contact a poison centre immediately after a suspected ingestion.

What should I do if my child may have swallowed eye drops?

Remove the bottle, check the label for tetrahydrozoline, and call a poison centre right away. Keep the container available. Do not cause vomiting or give anything by mouth unless a poison specialist tells you to. Call emergency services for sleepiness, breathing changes, fainting, or difficulty waking.

Is there an antidote?

There is no specific, consistently effective antidote. Hospital treatment supports breathing, heart rate, and blood pressure until the medicine is cleared. Naloxone may be tried when opioid poisoning is also possible, but it does not reliably reverse tetrahydrozoline.

How long does recovery take?

Many people improve after monitored supportive care, but symptoms may last for many hours and occasionally longer. Recovery time is influenced by the amount swallowed, age, other substances, and whether breathing or circulation complications occurred.

Can using too many redness-relief drops poison me?

Severe systemic poisoning is most strongly associated with swallowing, but excessive use can increase absorption and may cause side effects. Frequent use can also produce rebound redness. Stop escalating use and arrange routine medical or eye-care advice if redness persists or repeatedly returns.

Sources

- US Food and Drug Administration: Serious adverse events from accidental ingestion by children of over-the-counter eye drops and nasal sprays
- MedlinePlus Medical Encyclopedia: Tetrahydrozoline poisoning
- DailyMed: Visine Original Redness Relief-tetrahydrozoline hydrochloride ophthalmic solution



- Royal Children's Hospital Melbourne: Clinical Practice Guideline-Imidazoline poisoning
- Poison Control: Eye drops and nasal sprays-dangerous if swallowed