CONDITION

Aspirin overdose

Learn how aspirin overdose happens, which symptoms require emergency care, and how salicylate poisoning is diagnosed and treated.

WHAT IT IS
Poisoning from excess aspirin or salicylate exposure

BODY SYSTEM
Multiple body systems

MAIN SYMPTOMS
Nausea and vomiting, ringing in the ears, rapid or deep breathing, confusion

WHAT CAUSES IT
Excess aspirin or salicylate exposure

HOW IT IS DIAGNOSED
Repeated blood salicylate measurements

MAIN TREATMENT
Emergency supportive care and salicylate removal

CAN IT BE CURED?
Yes, most recover with prompt treatment

IS IT AN EMERGENCY?
Yes, if overdose may have occurred

LONG-TERM OUTLOOK
Usually recovery with prompt treatment, with lasting neurologic injury or death in severe cases

Overview

An aspirin overdose happens when the body is exposed to more aspirin than it can safely process. Aspirin contains a type of medicine called a salicylate . Too much salicylate can disrupt breathing, body temperature, blood sugar, and the balance of acids and salts in the blood.

An overdose may occur after one large amount, known as acute poisoning . It may also develop gradually when aspirin or another salicylate is taken repeatedly over several days. This is called chronic poisoning . Chronic poisoning can be harder to recognize because symptoms may look like an infection, dehydration, or another medical problem.

Salicylates are found in more than standard aspirin tablets. Some combination medicines, topical pain products, and stomach remedies contain salicylate ingredients. Oil of wintergreen

contains methyl salicylate, a concentrated chemical related to aspirin. Swallowing it can be especially dangerous.

Aspirin overdose is a medical emergency because a person may become seriously ill even if early symptoms seem mild. Enteric-coated aspirin, which is designed to dissolve slowly, can delay both symptoms and changes in blood test results.

If an overdose may have occurred, do not wait for symptoms. In the United States, call Poison Control at 1-800-222-1222 for immediate guidance. Outside the United States, contact the local poison center or emergency medical service. Call emergency services now if the person has trouble breathing, collapses, has a seizure, cannot be awakened, or is severely confused.

Symptoms

Symptoms depend on the amount taken, how quickly exposure occurred, the person's age and health, and whether other substances were involved. With a large single exposure, symptoms may begin within hours. Delayed-release products can take longer.

Early symptoms may include:

As poisoning becomes more severe, symptoms may include fever, dehydration, confusion, unusual sleepiness, poor coordination, hallucinations, or agitation. Blood sugar may fall, particularly in children. In some cases, the brain may not receive enough glucose even when a standard blood glucose result is not very low.

Severe poisoning can cause seizures, coma, kidney injury, fluid in the lungs, and dangerous changes in the body's acid balance. Breathing may become extremely fast before later becoming weak or irregular.

Chronic salicylate poisoning often causes less specific symptoms. An older adult, for example, may develop confusion, weakness, rapid breathing, poor appetite, or repeated vomiting. These symptoms can be mistaken for pneumonia, a urinary infection, or age-related confusion.

Aspirin can also affect platelets, the blood cells that help stop bleeding. Unusual bruising, bloody vomit, black stools, or other bleeding should be reported promptly, although severe salicylate poisoning can occur without visible bleeding.

- Nausea, vomiting, or stomach pain
- Ringing or buzzing in the ears, called tinnitus
- Reduced hearing
- Fast or unusually deep breathing

- Sweating, thirst, or dizziness
- Headache, restlessness, or anxiety
- A rapid heartbeat

Causes and risk factors

Aspirin overdose may be accidental, intentional, or related to repeated dosing. Children may swallow tablets that were not stored securely. Adults may accidentally take more than one medicine containing aspirin or another salicylate.

Intentional self-poisoning requires both emergency medical care and compassionate mental health support. If you or someone else may be at immediate risk of self-harm, call emergency services or a local crisis service now. In the United States, call or text 988 for the Suicide & Crisis Lifeline.

Factors that can increase the likelihood or severity of poisoning include:

Chronic poisoning may occur even without a single obvious overdose. This is more likely when salicylate use continues during dehydration, acute illness, or declining kidney function.

- Taking a large amount at one time
- Repeated doses that exceed the product directions
- Using several salicylate-containing products together
- Kidney disease, which can slow removal of salicylate
- Dehydration from vomiting, fever, poor fluid intake, or illness
- Older age or very young age
- Delayed-release or enteric-coated tablets
- Concentrated products such as oil of wintergreen
- Taking other medicines or substances at the same time

Diagnosis

A suspected aspirin overdose is assessed in an emergency department. Clinicians ask what product was taken, how much may be missing, when exposure occurred, and whether the medicine was immediate-release or enteric-coated. They also ask about other medicines, alcohol, recreational substances, medical conditions, and current symptoms.

If it can be done safely, bring the medicine container or a clear photograph of its label. Do not delay emergency care to search for packaging.

Blood tests measure the salicylate concentration. A single result may not show the full risk. Levels can continue rising as aspirin is absorbed, especially after enteric-coated tablets or a large number of tablets that have formed a clump in the stomach. Clinicians therefore commonly repeat salicylate measurements and assess whether levels are rising or falling.

The number alone does not determine severity. Doctors interpret it together with symptoms, the timing and pattern of exposure, blood acidity, kidney function, age, and other findings. People with chronic poisoning may be seriously ill at a lower measured concentration than someone assessed soon after a single exposure.

Other testing may include:

Salicylate poisoning often causes a complicated acid-base disturbance. At first, the person's fast breathing removes too much carbon dioxide, making the blood more alkaline. As toxicity continues, acids can build up and make the blood more acidic. Increasing acidity allows more salicylate to enter tissues, including the brain.

- Electrolytes and kidney function
- Blood glucose
- A blood gas test to measure acidity, oxygen, and carbon dioxide
- An electrocardiogram to check heart rhythm
- Tests for other common substances taken in overdose, when appropriate
- A chest X-ray if breathing problems suggest fluid in the lungs

Treatment and management

Treatment begins while testing is underway. The goals are to limit further absorption, support breathing and circulation, correct fluid and electrolyte problems, and help the kidneys remove salicylate.

Do not make the person vomit. Do not give food, drinks, antacids, or home remedies unless a poison specialist or clinician specifically advises it.

Medical treatment may include activated charcoal , a substance that binds medicine in the digestive tract. It may be considered when aspirin could still be present in the stomach or intestines. It is not safe for everyone, particularly if the person cannot protect their airway. Additional charcoal may sometimes be considered when absorption is delayed.

Intravenous fluids may be used to treat dehydration. Glucose may be given when blood sugar is low or when neurologic symptoms suggest that the brain is not receiving enough glucose.

A key treatment is intravenous sodium bicarbonate . This makes the blood and urine more alkaline. Alkaline urine helps the kidneys move salicylate out of the body, while a safer blood pH reduces movement of salicylate into the brain. Potassium levels are monitored and corrected because low potassium can make urine alkalinization difficult.

Clinicians closely monitor temperature, breathing, mental status, urine output, blood acidity, glucose, electrolytes, kidney function, and repeated salicylate levels.

Hemodialysis may be needed for severe poisoning. Dialysis passes the blood through a machine that quickly removes salicylate and corrects acid, fluid, and electrolyte problems. It may be considered when there are serious neurologic symptoms, lung fluid, kidney failure, worsening acid buildup, very high or rising salicylate levels, or failure to improve with other treatment. The decision is based on the whole clinical picture rather than one laboratory value.

Breathing support requires special care. If a breathing tube becomes necessary, clinicians must try to maintain the person's previously high breathing rate. A sudden slowing of breathing can rapidly increase blood acidity and worsen movement of salicylate into the brain.

Complications

Most people can recover when poisoning is recognized and treated promptly. The risk of complications rises with delayed care, severe acid buildup, chronic poisoning, kidney problems, and changes in consciousness.

Possible complications include:

Ringing in the ears and reduced hearing often improve as salicylate levels fall, although hearing symptoms should still be discussed with the treating team. Complications can occasionally appear or worsen after an initial improvement, which is why observation and repeated testing may be necessary.

- Severe dehydration and electrolyte disturbances
- Low blood sugar or reduced glucose supply to the brain
- Kidney injury
- Fluid buildup in the lungs without heart failure
- Brain swelling, seizures, or coma
- Abnormal heart rhythms

- Aspiration of vomit into the lungs
- Lasting neurologic injury in severe cases
- Death

Follow up

Discharge is considered only after symptoms have improved, salicylate levels are safely decreasing, acid-base problems have resolved, and the clinical team believes delayed absorption is no longer a concern. The required observation period varies, so a person should not leave medical care based only on feeling better.

After discharge, follow the treating team's instructions about repeat blood tests, hydration, activity, and restarting medicines. Do not restart aspirin or another salicylate-containing product until a clinician or pharmacist confirms that it is appropriate.

Arrange routine follow-up if the overdose was related to confusing labels, several overlapping medicines, chronic pain treatment, kidney problems, or difficulty managing doses. A medication review can identify hidden salicylates and safer ways to organize treatment.

If the exposure was intentional, follow-up should include a mental health assessment and a safety plan. This is a routine and important part of care, not a punishment.

To reduce future risk, store medicines in their original containers, keep them out of children's reach, and check active-ingredient labels. Ask a pharmacist before combining pain relievers, cold medicines, stomach remedies, or topical products.

After discharge, seek urgent medical advice for returning vomiting, ringing in the ears, rapid breathing, increasing weakness, or confusion. Call emergency services for a seizure, collapse, severe breathing difficulty, inability to awaken, or rapidly worsening mental status.

Sources

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