CONDITION

Anticoagulant rodenticides poisoning

Learn how anticoagulant rat and mouse poisons affect blood clotting, which symptoms need urgent care, and how exposure is tested and treated.

WHAT IT IS
Poisoning that interferes with blood clotting

BODY SYSTEM
Blood and circulation

MAIN SYMPTOMS
Unexplained bruising, prolonged nosebleeds, blood in urine or stool, weakness

WHAT CAUSES IT
Anticoagulant rodenticide exposure

HOW IT IS DIAGNOSED
Exposure history and PT/INR blood tests

MAIN TREATMENT
Antidote therapy and clotting-factor replacement

CAN IT BE CURED?
Yes, after the poison has cleared

IS IT AN EMERGENCY?
Sometimes, with heavy or uncontrolled bleeding

LONG-TERM OUTLOOK
Long-acting poisoning may require prolonged treatment and monitoring

Overview

Anticoagulant like warfarin or apixaban rodenticides are chemicals used to kill rats and mice by interfering with blood clotting. They block the body's ability to recycle vitamin K, which the liver needs to make several clotting proteins. Without enough working clotting proteins, bleeding can occur.

Some products contain older, shorter-acting anticoagulants such as warfarin. Others contain long-acting chemicals, sometimes called "superwarfarins," such as brodifacoum, bromadiolone, difenacoum, or difethialone. Long-acting products can remain in the body for weeks or longer. A person with significant poisoning may therefore need extended monitoring and treatment.

Symptoms are often delayed. Someone may initially feel well even after an important exposure

because the clotting proteins already in the bloodstream need time to wear off. This is why suspected ingestion should be discussed promptly with a poison center or medical professional rather than waiting for bleeding to begin.

Not every rat or mouse poison is an anticoagulant. Products containing bromethalin, cholecalciferol, or metal phosphides cause different forms of poisoning and require different care. The product package, label, or a photograph of the label can help identify the active ingredient.

In the United States, Poison Help is available at 1-800-222-1222 . Outside the United States, contact the local poison center or emergency service. Call even if the exposed person has no symptoms. Do not make the person vomit unless a poison specialist specifically tells you to do so.

Symptoms

Anticoagulant rodenticide poisoning may not cause immediate symptoms. Bleeding can appear after a delay, especially after a substantial ingestion or repeated exposure.

Possible symptoms include:

Contact a poison center promptly after any suspected ingestion, even when there are no symptoms. Children who taste or handle a product still need an individual risk assessment because the ingredient and amount matter.

Seek emergency care for uncontrolled bleeding, vomiting blood, black or bloody stool, fainting, severe weakness, trouble breathing, chest pain, a severe or unusual headache, confusion, a seizure, or loss of consciousness. Any ingestion connected with self-harm also requires immediate emergency and mental health support.

- Easy or unexplained bruising
- Frequent or prolonged nosebleeds
- Bleeding from the gums
- Bleeding that continues longer than expected after a small cut
- Pink, red, or brown urine
- Red blood in the stool or black, tar-like stool
- Vomiting or coughing up blood
- Heavier or longer menstrual bleeding than usual

- Weakness, fatigue, pale skin, dizziness, or shortness of breath from blood loss
- Abdominal, back, joint, or muscle pain caused by internal bleeding
- Severe headache, confusion, weakness on one side, or loss of consciousness if bleeding occurs around the brain

Causes and risk factors

Poisoning most often follows swallowing a rodenticide. Exposure may be accidental, intentional, or repeated over time. Young children may find bait placed within reach. Adults can be exposed through self-harm, misuse, contaminated substances, or work involving pest-control products.

Serious outbreaks have also occurred when long-acting anticoagulant rodenticides contaminated illicit synthetic cannabinoid products. The contents of such products are unpredictable, and users may not know they were exposed.

The risk of significant poisoning depends on several factors:

People taking prescription blood thinners, antiplatelet medicines, or certain pain relievers may have a higher risk of bleeding. Liver disease, an existing bleeding disorder, poor nutrition, or conditions that interfere with vitamin absorption can also affect clotting. These factors do not confirm poisoning, but they help clinicians decide how closely someone should be monitored.

Touching intact bait usually causes less exposure than swallowing it. However, hands should be washed after contact, and contaminated clothing should be removed. If material gets into the eyes, rinse with clean water and obtain poison-center advice. Follow the product label for safe cleanup and disposal.

- The active ingredient and its concentration
- The amount swallowed
- Whether exposure happened once or repeatedly
- The time since exposure
- Whether symptoms or abnormal clotting tests are already present
- Other medicines or health conditions that increase bleeding risk

Diagnosis

Diagnosis begins with the exposure history. Clinicians will ask about the product, active

ingredient, amount that may be missing, time of exposure, symptoms, and medicines being taken. Bringing the container or a clear photograph of the label can be very helpful. Do not bring loose poison into a healthcare setting unless instructed.

The main screening test is the prothrombin time , usually reported as the international normalized ratio , or INR. This test measures how long blood takes to clot through pathways that depend on vitamin K. A high INR means clotting is taking longer than expected.

An INR can be normal soon after exposure. Depending on the product and circumstances, clinicians or poison specialists may arrange repeat testing after enough time has passed for an effect to appear. The timing should be individualized rather than decided at home.

Other tests may include a complete blood count to look for anemia, additional clotting tests, and tests of liver or kidney function. If internal bleeding is suspected, imaging such as a CT scan or ultrasound may be needed.

Specialized laboratories can sometimes measure long-acting anticoagulant chemicals in blood. These tests are not always quickly available and are not required for every case. They may be useful when the exposure is unclear, clotting abnormalities keep returning, or clinicians need help deciding how long treatment should continue.

An abnormal INR is not specific to rodenticide poisoning. Prescription anticoagulants, liver disease, severe vitamin K deficiency, and other illnesses can produce similar results. The medical team considers the history, examination, laboratory pattern, and response to treatment together.

Treatment and management

Treatment depends on the ingredient, amount, time since exposure, laboratory results, and whether bleeding is present. A poison center or medical toxicologist can help guide care.

After a very recent and potentially important ingestion, clinicians may consider activated charcoal to reduce absorption. It is not suitable for every patient and can enter the lungs if given to someone who is vomiting, very sleepy, or unable to protect the airway. Activated charcoal should not be used at home unless a qualified professional specifically directs it.

People with a low-risk accidental exposure may need observation and appropriately timed blood tests rather than immediate medicine. Preventive vitamin K is not automatically given after every exposure because it can temporarily hide the expected change in INR and make assessment more difficult.

When poisoning causes impaired clotting, the antidote is vitamin K1 , also called phytonadione. It allows the liver to begin making functional clotting proteins again. Vitamin K1 may be given

by mouth or, in serious situations, through a vein. The route and treatment plan depend on the urgency and the person's condition.

Vitamin K does not correct clotting instantly because the liver needs time to produce new proteins. A person with major or life-threatening bleeding may also need rapid replacement of clotting factors. Hospitals may use a prothrombin complex concentrate or plasma, along with vitamin K1. Red blood cell transfusion may be needed if blood loss has caused severe anemia.

Long-acting rodenticides can require vitamin K1 treatment for an extended period. The necessary duration varies widely and should be guided by repeated INR testing and, in selected cases, measurement of the rodenticide level. Treatment should not be stopped or changed without medical supervision because bleeding risk can return after vitamin K wears off.

Vitamin K products sold as supplements are not a safe substitute for prescribed treatment. Different forms of vitamin K are not interchangeable, and over-the-counter products may not provide the appropriate formulation or reliable amount.

Care also includes finding and stopping the source of exposure. Intentional ingestion should lead to a compassionate mental health assessment once immediate medical needs are addressed. If a contaminated recreational substance is suspected, clinicians may involve public health authorities to help prevent further cases.

Complications

The main complication is bleeding. This may be visible, such as a nosebleed or blood in the urine, or hidden inside the abdomen, chest, muscles, joints, or tissues behind the abdominal organs.

Heavy blood loss can cause anemia, low blood pressure, organ injury, or shock. Bleeding around the brain is uncommon but can be life-threatening. Severe headache, confusion, new weakness, a seizure, or loss of consciousness requires emergency evaluation.

Long-acting products can cause recurrent clotting problems if vitamin K1 is stopped before the poison has cleared. Repeated blood tests and prolonged treatment can also affect work, school, transportation, and medication access. Discussing these barriers early can help the care team create a safer follow-up plan.

Follow up

Follow-up is especially important after exposure to a long-acting anticoagulant. The medical team will set an INR testing schedule based on the product, previous results, symptoms, and

treatment. Some people need only limited testing, while confirmed significant poisoning may require monitoring over a much longer period.

Take prescribed vitamin K1 exactly as directed. If a dose is missed, contact the treating team for instructions rather than doubling the next dose. Attend laboratory appointments even when you feel well, because an abnormal INR may develop without obvious symptoms.

Before starting aspirin, ibuprofen, naproxen, herbal remedies, or dietary supplements, ask the treating clinician whether they could increase bleeding risk or affect treatment. Do not stop a prescribed medicine without professional advice. Tell dentists, surgeons, and other healthcare professionals about the poisoning and current treatment before a procedure.

Routine follow-up should address test results, medication access, side effects, and the expected length of monitoring. Contact the treating team promptly for new bruising, mild but persistent nose or gum bleeding, heavier menstrual bleeding, or blood-tinged urine.

Seek emergency care for heavy or uncontrolled bleeding, vomiting blood, black or bloody stool, fainting, breathing difficulty, severe weakness, a significant head injury, or new neurological symptoms such as confusion or one-sided weakness.

To prevent another exposure, keep rodenticides in their original labeled containers and in locked areas away from children and pets. Avoid placing loose bait where it can be mistaken for food. Use tamper-resistant bait stations and follow local rules for disposal.

Sources

- Caravati EM, Erdman AR, Scharman EJ, et al. "Long-Acting Anticoagulant Rodenticide Poisoning: An Evidence-Based Consensus Guideline for Out-of-Hospital Management." Clinical Toxicology . 2007;45(1):1-22.
- King N, Tran MH. "Long-Acting Anticoagulant Rodenticide (Superwarfarin) Poisoning: A Review of Its Historical Development, Epidemiology, and Clinical Management." Transfusion Medicine Reviews . 2015;29(4):250-258.
- American College of Medical Toxicology. "ACMT Position Statement: Duration of Outpatient Follow-up for Long-Acting Anticoagulant Rodenticide Poisoning." Journal of Medical Toxicology . 2020;16:194-197.
- Centers for Disease Control and Prevention. "Outbreak of Life-Threatening Coagulopathy Associated with Synthetic Cannabinoids Use." Morbidity and Mortality Weekly Report . 2018;67:607-608.

- U.S. Environmental Protection Agency. "Rodenticides." Pesticide safety and regulation information.
- National Capital Poison Center. "Rodenticides: Rat and Mouse Poison." Poison Control consumer and clinical safety information.