CONDITION

Diazinon poisoning

Diazinon poisoning is harmful overstimulation of nerves after exposure to the organophosphate insecticide diazinon.

WHAT IT IS
Toxic nerve overstimulation caused by the insecticide diazinon

BODY SYSTEM
Nervous, breathing, digestive, heart, and muscle systems

MAIN SYMPTOMS
Excess saliva, vomiting, pinpoint pupils, breathing difficulty

WHAT CAUSES IT
Exposure to a cholinesterase-blocking organophosphate insecticide

HOW IT IS DIAGNOSED
Exposure history, examination, and blood cholinesterase tests

MAIN TREATMENT
Decontamination, breathing support, atropine, and oxime antidote

CAN IT BE CURED?
Yes - prompt treatment can reverse toxic effects

IS IT AN EMERGENCY?
Yes - suspected poisoning needs immediate medical assessment

LONG-TERM OUTLOOK
Often full recovery; severe cases may cause lasting injury

Overview

Diazinon is an organophosphate insecticide. It interferes with acetylcholinesterase, an enzyme that normally switches off signals between nerves, muscles, and glands.

When this enzyme is blocked, the chemical messenger acetylcholine builds up. Nerves keep sending signals, causing heavy secretions, vomiting, muscle twitching, weakness, confusion, and potentially life-threatening breathing problems.

Poisoning can occur after swallowing diazinon, breathing spray or mist, or getting concentrated product on the skin or in the eyes. Exposure may happen while mixing or applying pesticide, entering a recently treated area, handling contaminated clothing, or storing pesticide incorrectly.

Symptoms often begin within minutes to hours. They may appear more slowly after skin exposure. Because severe poisoning can worsen quickly, suspected diazinon poisoning should be treated as an emergency.

Symptoms

Symptoms result from excessive nerve activity throughout the body. They may include:

Breathing may become difficult because the airways narrow and fill with secretions while the muscles needed for breathing weaken. This combination is the main immediate danger. A person may also have trouble walking, lifting their head, swallowing, or taking a full breath.

A garlic-like or chemical smell may sometimes be noticed, but smell cannot confirm or rule out exposure.

Some people develop renewed muscle weakness one to four days after the first symptoms improve. This is called intermediate syndrome and can affect the neck, limbs, swallowing muscles, and breathing muscles.

Rarely, pain, tingling, or weakness in the hands and feet develops weeks later. This delayed nerve problem is not typical after a mild exposure.

- Heavy saliva, tears, or sweating
- Nausea, vomiting, stomach cramps, or diarrhea
- Frequent urination
- Increased mucus in the lungs
- Pinpoint pupils and blurred vision
- Muscle twitching, cramps, shakiness, weakness, or paralysis
- Headache, dizziness, anxiety, confusion, or unusual sleepiness
- Seizures or loss of consciousness
- An unusually slow, fast, or unstable heart rate or blood pressure

Causes and risk factors

Diazinon poisoning occurs when enough diazinon is absorbed to disrupt nerve signalling. The body converts diazinon into diazoxon, a more active chemical that blocks acetylcholinesterase.

Exposure can occur through swallowing pesticide, inhaling droplets or vapour, or touching

liquid, contaminated clothing, or treated surfaces. Concentrated products generally pose greater risk than properly diluted products.

Risk increases when people mix pesticide without suitable protective equipment, spray in poorly ventilated spaces, use leaking equipment, or handle contaminated clothing. Children may be poisoned when pesticide is stored in an unlabelled cup, drink bottle, or food container.

Using a product against label instructions or combining pesticides can also increase risk. People helping someone covered in pesticide may be exposed through contaminated skin, clothing, vomit, or equipment. They should avoid direct contact and use protective barriers where possible.

Diagnosis

Healthcare professionals diagnose diazinon poisoning from the exposure history and pattern of symptoms. Important findings include excess secretions, small pupils, muscle twitching or weakness, digestive symptoms, and breathing difficulty.

If it is safe, provide the product container, label, safety data sheet, or a photograph of the label. Do not carry a leaking or contaminated container into a vehicle or healthcare building. The product name and concentration are important because some mixtures contain several active ingredients.

Blood tests can measure cholinesterase activity. Plasma cholinesterase is often sensitive to exposure, while red blood cell acetylcholinesterase may better reflect effects at nerve connections. Results can support diagnosis and follow recovery, but normal levels vary and testing may not be available quickly. Emergency treatment should not wait for results when significant poisoning is suspected.

Other tests may include oxygen measurements, blood gases, an electrocardiogram, and blood tests for kidney function, electrolytes, and glucose. A chest X-ray may be needed for breathing problems or suspected inhalation of vomit.

Treatment and management

The first priorities are stopping exposure and supporting breathing. Because contaminated skin and clothing can expose other people, decontamination requires appropriate protection.

Contaminated clothing is removed and isolated. Skin is washed thoroughly with soap and water, and exposed eyes are rinsed with clean water or saline. Avoid harsh scrubbing and bleach, which can damage the skin.

Do not induce vomiting if diazinon has been swallowed. Vomiting may allow pesticide or solvents in the product to enter the lungs. A poison centre or emergency team can give instructions for the specific exposure.

Hospital treatment may include oxygen, suctioning of lung secretions, and a breathing tube with mechanical ventilation if breathing is failing.

Atropine is an antidote that reduces dangerous airway secretions, helps open the airways, and supports circulation. Treatment is guided mainly by breathing, chest secretions, and blood pressure rather than pupil size alone.

An oxime antidote, usually pralidoxime, may help restore the blocked enzyme, particularly when muscle weakness or significant poisoning is present. It is generally most useful when given early, although specialists consider the timing, symptoms, and product involved.

Benzodiazepines like diazepam or lorazepam may be used for seizures or severe agitation. Fluids, heart monitoring, temperature control, and treatment of complications may also be required.

Observation continues after initial improvement when necessary because symptoms can return or delayed weakness can develop. Monitoring time depends on the exposure route, severity, treatment required, and clinical progress.

Complications

The most serious complication is respiratory failure. It can result from fluid and mucus in the airways, airway narrowing, reduced brain control of breathing, or weak breathing muscles.

Vomiting or secretions may enter the lungs, causing inflammation or pneumonia. Prolonged low oxygen can injure the brain, heart, kidneys, and other organs.

Other complications include abnormal heart rhythms, very low blood pressure, seizures, pancreatic inflammation, and muscle breakdown. Intermediate syndrome may cause new weakness after the initial crisis, sometimes requiring renewed breathing support.

Long-term nerve symptoms are uncommon but may include numbness, pain, balance problems, or weakness. Severe oxygen deprivation or prolonged seizures can cause lasting brain injury.

Prevention

Follow the product label, including approved uses, mixing instructions, protective equipment,

and the time people or animals must remain away from treated areas.

Keep pesticide in its original labelled container. Never transfer it into a bottle, cup, food container, or household spray bottle. Store it locked away from children, food, animal feed, and medicines.

Wear the protective clothing and equipment listed on the label. Do not eat, drink, smoke, or touch your face while handling pesticide. Wash your hands and exposed skin afterward.

Remove contaminated work clothing before entering living areas. Keep it separate from household laundry and follow local guidance for cleaning or disposal. Heavily soaked clothing or leather items may not be safe to reuse.

Use only the stated amount, and do not mix products unless the label specifically instructs you to. Avoid spraying where pesticide could drift toward people, homes, water, or animals.

Workplaces should provide training, functioning equipment, washing facilities, and access to product labels and safety information.

Living with it and what to expect

Mild poisoning may improve over hours to days once exposure stops and treatment controls the excess nerve activity. Fatigue, headache, blurred vision, reduced appetite, or weakness may continue after the main symptoms settle.

Moderate or severe poisoning may require several days of monitoring, especially after antidote treatment or breathing support. Cholinesterase activity can remain low after visible symptoms improve.

Follow-up may assess breathing, muscle strength, swallowing, walking, memory, mood, and readiness to return to work. Rehabilitation may help with significant weakness or nerve injury.

New weakness, tingling, balance problems, or breathing difficulty during the following days or weeks needs prompt medical assessment. Many people recover fully, especially after limited exposure and prompt care. Severe poisoning may leave physical or cognitive problems. Further organophosphate exposure should be avoided while recovery is incomplete.

When to get medical help

Call emergency services immediately if diazinon poisoning is suspected and the person has trouble breathing, heavy secretions, repeated vomiting, muscle twitching or weakness, confusion, a seizure, or reduced consciousness.

Move away from spray or fumes without entering a contaminated area yourself. Avoid direct contact if the person is covered in pesticide. Emergency dispatchers can explain how to help safely.

After skin exposure, remove contaminated clothing and wash the skin with soap and water if safe to do so. After eye exposure, rinse continuously with clean lukewarm water. Do not delay emergency help to finish decontamination.

If diazinon has been swallowed, contact emergency services or a poison centre immediately. Do not induce vomiting or give food, drink, or home remedies unless a poison specialist instructs you to.

An exposure without symptoms still requires prompt poison-centre advice. The product concentration, amount, exposure route, and time since exposure determine whether home monitoring or medical assessment is appropriate.

After treatment, seek urgent reassessment if symptoms worsen, return after improving, or include new swallowing, walking, or breathing problems. Routine follow-up is appropriate when tiredness, mild weakness, vision changes, or concentration problems are gradually improving.

Common questions

How quickly does diazinon poisoning start?

Symptoms may begin within minutes after swallowing or inhaling diazinon but can take several hours after skin exposure. Timing depends on the amount, concentration, exposure route, and whether contaminated clothing remains in place.

Can you get diazinon poisoning through your skin?

Yes. Diazinon can be absorbed through the skin, especially after contact with concentrated liquid or wet clothing. Symptoms may be delayed, so washing does not replace poison-centre or medical advice.

Is there an antidote for diazinon poisoning?

Yes. Atropine treats dangerous secretions, airway narrowing, and some circulation effects. Pralidoxime may help restore the affected enzyme and improve muscle weakness. Both require medical monitoring.

Can diazinon poisoning come back after treatment?

Yes. Symptoms can return after initial improvement, particularly after substantial exposure. Delayed muscle weakness may also appear over the next few days, making observation and clear discharge instructions important.

Does a low cholinesterase blood test confirm poisoning?

A low result supports organophosphate exposure but must be interpreted alongside symptoms, timing, and any previous baseline result. Levels vary between people and may remain abnormal after recovery.

Can diazinon poisoning cause permanent damage?

Most people with mild poisoning recover without permanent injury. Lasting problems can occur after severe breathing failure, prolonged seizures, low oxygen, or delayed nerve injury.

Sources

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