



FACT SHEET

Facts About Paraquat

What paraquat is

- Paraquat is a toxic chemical that is widely used as an herbicide (plant killer), primarily for weed and grass control.
- In the United States, paraquat is available primarily as a liquid in various strengths. It is classified as "restricted use," which means that it can be used only by people who are licensed applicators.
- Because paraquat is highly poisonous, the form of it that is marketed in the United States has a blue dye to keep it from being confused with beverages such as coffee, a sharp odor to serve as a warning, and an added agent to cause vomiting if someone drinks it. Paraquat from outside the United States may not have these safeguards added.

Where paraquat is found and how it is used

- Paraquat was first produced for commercial purposes in 1961.
- Worldwide, paraquat is still one of the most commonly used herbicides.
- In the United States, due to its toxicity, paraquat is available for use only by commercially licensed users.

How you could be exposed to paraquat

- Paraquat is not known to have been used in any terrorist attacks or wars.
- The most likely route of exposure to paraquat that would lead to poisoning is ingestion (swallowing).
- Paraquat can be easily mixed with food, water, or other beverages. If the form of paraquat that is used is the form that does not contain the safeguard additives (dye, odor, and vomiting agent), people might not know that the food, water, or other beverages are contaminated. Eating or drinking paraquat-contaminated food or beverages could poison people.
- Paraquat poisoning is also possible after skin exposure. Poisoning is more likely to occur if the skin exposure lasts for a long time, involves a concentrated version of paraquat, or occurs through skin that is not intact (skin that has sores, cuts, or a severe rash).
- If it is inhaled, paraquat could cause poisoning leading to lung damage. In the past, some marijuana in the United States has been found to contain paraquat.
- Licensed applicators of paraquat are the people most at risk for exposure.

How paraquat works

- The extent of poisoning caused by paraquat depends on the amount, route, and duration of exposure and the person's condition of health at the time of the exposure.
- Paraquat causes direct damage when it comes into contact with the lining of the mouth, stomach, or intestines.
- After paraquat enters the body, it is distributed to all areas of the body. Toxic chemical reactions occur throughout many parts of the body, primarily the lungs, liver, and kidneys.
- The actual mechanism by which paraquat damages the lungs is not known.

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Immediate signs and symptoms of paraquat exposure

- After a person ingests a large amount of paraquat, he or she is likely to immediately have pain and swelling of the mouth and throat. The next signs of illness following ingestion are gastrointestinal (digestive tract) symptoms, such as nausea, vomiting, abdominal pain, and diarrhea (which may become bloody).
- Severe gastrointestinal symptoms may result in dehydration (not enough fluids in the body), electrolyte abnormalities (not enough sodium and potassium in the body), and low blood pressure.
- Ingestion of small to medium amounts of paraquat may lead to development of the following adverse health effects within several days to several weeks:
 - Liver failure
 - Kidney failure
 - Heart failure
 - Lung scarring (may evolve over several weeks)
- In general, ingestion of large amounts of paraquat leads to the following signs/symptoms within a few hours to a few days:
 - Pulmonary edema (fluid in the lungs)
 - Lung scarring (evolves more quickly than when small to medium amounts have been ingested)
 - Liver failure
 - Kidney failure
 - Confusion
 - Coma
 - Seizures
 - Injury to the heart
 - Fast heart rate
 - Muscle weakness
 - Respiratory (breathing) failure, possibly leading to death
- Showing these signs and symptoms does not necessarily mean that a person has been exposed to paraquat.

What the long-term health effects are

- If a person survives the toxic effects of paraquat poisoning, long-term lung damage (scarring) is highly likely. Other long-term effects may also occur, including kidney failure, heart failure, and esophageal strictures (scarring of the swallowing tube that makes it hard for a person to swallow).
- People with high-dose exposure to paraquat are not likely to survive.

How you can protect yourself, and what you should do if you are exposed to paraquat

- Since ingestion is likely to be the primary route of exposure, if poisoning is suspected, avoid any further ingestion and call 911 immediately.
- Inducing vomiting (giving ipecac) is unlikely to be of any benefit unless done within a few minutes of ingestion. Activated charcoal should be ingested if it is available. Ingestion of food (or even plain dirt) may be of some benefit if charcoal is not readily available.
- If you think you may have been exposed to liquid paraquat on your clothes or body, remove your clothing, rapidly wash your entire body with soap and water, and get medical care as quickly as possible.

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- **Removing your clothing:**
 - Quickly take off clothing that has liquid paraquat on it. Any clothing that has to be pulled over the head should be cut off the body instead of pulled over the head.
 - If you are helping other people remove their clothing, try to avoid touching any contaminated areas, and remove the clothing as quickly as possible.
- **Washing yourself:**
 - As quickly as possible, wash any liquid paraquat from your skin with large amounts of soap and water. Washing with soap and water will help protect people from any chemicals on their bodies.
 - If your eyes are burning or your vision is blurred, rinse your eyes with plain water for 10 to 15 minutes. If you wear contacts, remove them and put them with the contaminated clothing. Do not put the contacts back in your eyes (even if they are not disposable contacts). If you wear eyeglasses, wash them with soap and water. You can put your eyeglasses back on after you wash them.
- **Disposing of your clothes:**
 - After you have washed yourself, place your clothing inside a plastic bag. Avoid touching contaminated areas of the clothing. If you can't avoid touching contaminated areas, or you aren't sure where the contaminated areas are, wear rubber gloves or put the clothing in the bag using tongs, tool handles, sticks, or similar objects. Anything that touches the contaminated clothing should also be placed in the bag. If you wear contacts, put them in the plastic bag, too.
 - Seal the bag, and then seal that bag inside another plastic bag. Disposing of your clothing in this way will help protect you and other people from any chemicals that might be on your clothes.
 - When the local or state health department or emergency personnel arrive, tell them what you did with your clothes. The health department or emergency personnel will arrange for further disposal. Do not handle the plastic bags yourself.
 - For more information about cleaning your body and disposing of your clothes after a chemical release, see "[Chemical Agents: Facts About Personal Cleaning and Disposal of Contaminated Clothing](http://www.bt.cdc.gov/planning/personalcleaningfacts.asp)" (<http://www.bt.cdc.gov/planning/personalcleaningfacts.asp>).
- Seek medical attention right away. Dial 911 and explain what has happened.

How paraquat exposure is treated

Treatment consists of removing the paraquat from the body (decontamination) and providing supportive medical care in a hospital setting. Supportive care includes intravenous fluids (fluids given through a needle inserted directly into a vein), medications to help with breathing and to raise low blood pressure, a ventilator to support breathing, and possibly dialysis for kidney failure (artificial kidneys). No proven antidote or cure exists for paraquat poisoning.

How you can get more information about paraquat

You can contact one of the following:

- Regional poison control center (1-800-222-1222)
- Centers for Disease Control and Prevention
 - Public Response Hotline (CDC)
 - English (888) 246-2675
 - Español (888) 246-2857
 - TTY (866) 874-2646
 - [Emergency Preparedness and Response Web site \(http://www.bt.cdc.gov/\)](http://www.bt.cdc.gov/)

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- E-mail inquiries: cdcreponse@ashastd.org
- Mail inquiries:
Public Inquiry c/o BPRP
Bioterrorism Preparedness and Response Planning
Centers for Disease Control and Prevention
Mailstop C-18
1600 Clifton Road
Atlanta, GA 30333
- Agency for Toxic Substances and Disease Registry (ATSDR) (1-888-422-8737)
 - E-mail inquiries: atsdric@cdc.gov
 - Mail inquiries:
Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop E-29
Atlanta, GA 30333
- Centers for Disease Control and Prevention (CDC), National Institute for Occupational Safety and Health (NIOSH), [Pocket Guide to Chemical Hazards](http://www.bt.cdc.gov) (<http://www.cdc.gov/niosh/npg/npgd0478.html>).

This fact sheet is based on CDC's best current information. It may be updated as new information becomes available.

Last reviewed on 05/08/03.

The Centers for Disease Control and Prevention (CDC) protects people's health and safety by preventing and controlling diseases and injuries; enhances health decisions by providing credible information on critical health issues; and promotes healthy living through strong partnerships with local, national, and international organizations.

For more information, visit www.bt.cdc.gov or call the CDC public response hotline at (888) 246-2675 (English), (888) 246-2857 (Español), or (866) 874-2646 (TTY)

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