

This fact sheet answers the most frequently asked health questions (FAQs) about malathion. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: The general population is probably not exposed to malathion regularly. However, malathion is used to treat head lice on humans, to kill fleas on pets, and to kill insects in gardens. Exposure to malathion may also occur at farms where it has been sprayed on crops. Exposure to high amounts of malathion can cause difficulty breathing, chest tightness, vomiting, cramps, diarrhea, blurred vision, sweating, headaches, dizziness, loss of consciousness, and possibly death. This chemical has been found in at least 21 of the 1,636 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is malathion?

Malathion is an insecticide that does not occur naturally. Pure malathion is a colorless liquid, and technical-grade malathion, which contains >90% malathion and impurities in a solvent, is a brownish-yellow liquid that smells like garlic. Malathion is used to kill insects on farm crops and in gardens, to treat lice on humans, and to treat fleas on pets. Malathion is also used to kill mosquitos and Mediterranean fruit flies (medflies) in large outdoor areas.

What happens to malathion when it enters the environment?

- ' Malathion enters the environment primarily through spraying on farm crops.
- ' Malathion does not stick to soil and is broken down rapidly by bacteria in the soil, so it does not usually move from the soil to groundwater.
- ' In water, malathion is broken down by the action of the water and bacteria in the water.
- ' In air, malathion is broken down by sunlight.
- ' Malathion is not expected to accumulate in the food chain due to rapid break down in aquatic organisms.

How might I be exposed to malathion?

- ' Most people are not exposed to malathion in the air they breathe or on things they touch, unless they live next to areas being sprayed.
- ' Farm workers, chemical sprayers, and people who work in factories that make malathion are most likely to be exposed.
- ' People who use it around their homes and people living in areas where malathion is sprayed to control medflies or mosquitos may also be exposed.
- ' People who live near landfills where it has been dumped may be exposed.
- ' Individuals may also be exposed by going into fields too soon after spraying.

How can malathion affect my health?

Malathion interferes with the normal way that the nerves and brain function. Exposure to very high levels of malathion for a short period in air, water, or food may cause difficulty breathing, chest tightness, vomiting, cramps, diarrhea, blurred vision, sweating, headaches, dizziness, loss of consciousness, and death. If persons who are exposed to high amounts of malathion are rapidly given appropriate treatment, there may be no long-term harmful effects. If

people are exposed to levels of malathion below those that affect nerve function, few or no health problems seem to occur.

How likely is malathion to cause cancer?

There is no conclusive proof that malathion causes cancer in humans, although some studies have found increased incidence of some cancers in people who are regularly exposed to pesticides, such as farmers and pesticide applicators. Animal studies also fail to provide conclusive evidence of carcinogenicity. The International Agency for Research on Cancer (IARC) has determined that malathion is unclassifiable as to carcinogenicity to humans.

How can malathion affect children?

It is likely that health effects seen in children exposed to high levels of malathion will be similar to the effects seen in adults. It is not known whether children are more sensitive to the effects of malathion than adults. There is some indication that young rats may be more sensitive than adults to nervous system effects.

Birth defects have not been observed in humans exposed to malathion, but developmental effects have been seen in the offspring of animals that ingested enough malathion while pregnant to cause health effects in the mother. Animal studies have shown that malathion can be transferred from a pregnant mother to the developing fetus and from a nursing mother to the newborns through the mother's milk.

How can families reduce the risk of exposure to malathion?

• The general population is not likely to be exposed to large amounts of malathion. However, exposure may be reduced by staying away from fields that have been recently sprayed, by wearing protective clothing when applying malathion around the home or in gardens, and by washing fruits and vegetables grown in gardens treated with malathion before eating. In areas where malathion is sprayed to control medflies or mosquitos, families can reduce exposure by

remaining inside during spraying periods, and by washing their hands and clothes if they come in contact with sprayed surfaces within a few days of the spraying.

• Children should avoid playing in soils near uncontrolled hazardous waste sites where malathion may have been discarded.

Is there a medical test to show whether I've been exposed to malathion?

Malathion can be detected in your blood and its breakdown products can be detected in your urine, but only within a few days after your last exposure. If exposure is known or suspected, a test can be done that measures cholinesterase levels in your blood. Low levels of cholinesterase may be a result of malathion exposure or may be caused by factors other than malathion. These tests are not usually available at your doctor's office, but your doctor can send the samples to a laboratory that can perform the tests. None of these tests, however, can predict whether you will experience any health effects.

Has the federal government made recommendations to protect human health?

The EPA has established a level of 0.1 milligrams of malathion per liter of drinking water (0.1 mg/L) for lifetime exposure of adults as a level that is not expected to cause effects that are harmful to health.

The EPA allows a maximum of 0.1-135 parts (0.1-135 ppm) malathion per million parts of certain types of food. The Occupational Safety and Health Administration (OSHA) has set a limit of 15 milligrams of malathion per cubic meter of workplace air (15 mg/m³) for 8 hour shifts and 40 hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2003. Toxicological Profile for Malathion. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

