



AUG 16 1979

UNIVERSITY OF IDAHO

First Aid for Pesticide Poisoning

Thomas J. Karsky
Extension Farm Safety Specialist

Hugh W. Homan
Extension Entomologist

Gene P. Carpenter
Pesticide Coordinator

Pesticides are necessary for the production of adequate quantities of food and fiber for a continuously growing population. They are used to protect both human and animal health, reduce populations of forest pests and control weeds, diseases and insects of crops. If we hope to retain these useful chemicals, we must learn to use them properly and safely.

Pesticides can kill or poison man and animals and harm the environment. Most poisonings result from careless use, improper storage or ignorance of the user. Children under 10 years of age are victims of at least half of the accidental pesticide poisonings in this country. Accidents with pesticides can be reduced if a few basic safety rules are followed. Persons who know they are going to work with pesticides should have their cholinesterase level assayed by a qualified medical laboratory early in the season followed by periodic tests to detect any changes.

Besides giving instructions for use and safety precautions, the label has one of three "signal words" that show how dangerous or toxic the contents are to man (Table 1). Signal words are determined by the level of toxicity, expressed as LD50, of the pesticide. The lower the LD50, the higher the toxicity of the pesticide. Therefore, a pesticide with an oral LD50 of 500 mg/kg of body weight would be much less toxic than a pesticide with an LD50 of 5.

Since accidental pesticide poisoning sometimes occurs despite precautions, now is the time to make a list of emergency telephone numbers so they will be readily available. Include in this list the numbers of a physician, hospital, ambulance and poison control center. Post these numbers on or near your telephone. (See the last page of this publication.)

Read and Follow Instructions

The most important rule to follow when using pesticides is: **Read and Follow the Instructions and Precautions on the Label.** Read the label *before* buying the product, *before* opening the container, *before* mixing the solution, *before* applying the solution and *before* disposing of unused portions of the solution or of empty containers. Be sure to wear the protective clothing and use the protective devices specified on the label.

Chemical Exposure

Pesticides enter the body in three ways: through the skin (dermal exposure), through the mouth (oral exposure) and through the lungs (respiratory exposure). Most pesticide poisonings occur through dermal exposure.

Organophosphates. Many organophosphates are highly toxic by any route of exposure. Examples include parathion, TEPP, Phosdrin, Thimet, Systox, Di-Syston, Guthion, phosphamidon and Monitor.

Table 1. Categories of acute toxicity.

Categories	Signal word required on label	LD-50* mg/kg		For a 200 lb. man a.i. to kill 50% oral
		Oral	Dermal	
Highly toxic	"Danger" Poison (printed in red) with skull and crossbones	up to 50	up to 200	0.0026-0.16 oz.
Moderately toxic	"Warning"	50-500	200-2,000	0.16-1.6 oz.
Slightly toxic	"Caution"	200-5,000	2,000-20,000	1.60 oz.-1 lb.
Relatively non-toxic	"Caution"	over 5,000	over 20,000	1 lb. +

*The dose required to produce death in 50 percent of exposed test animals.

3
322

Carbamates. Most carbamates are only moderately or slightly toxic. However, the following are highly toxic: Temik, Furadan, Carzol, Lannate and Vydate.

Chlorinated Hydrocarbons. Most chlorinated hydrocarbons are considered hazardous because they persist in the environment. However, some highly toxic dermally and orally are endrin, Thiodan and dieldrin.

Other Pesticides. Less frequently encountered are nitrophenols, pentachlorophenols, fumigants, solvents, inorganics and plant-derived pesticides. Most of these are highly toxic. Check the label for signal words.

Symptoms of Pesticide Poisoning

All family members and co-workers of individuals applying pesticides should be aware of early symptoms and signs of pesticide poisoning. Unfortunately, all pesticide poisoning symptoms are not the same. Each class of insecticides — organophosphates, carbamates and chlorinated hydrocarbons — attacks the human body in a different way. If you or any of your co-workers experience any symptoms or signs of poisoning after starting to work or later in the day, get medical help immediately. **Any delay could be fatal.**

Synthetic Organic Pesticides

Organophosphates. These pesticides attack the nervous system. The signs and symptoms normally occur in the following order:

Mild poisoning:

- fatigue
- headache
- dizziness
- blurred vision
- excessive sweating and salivation
- nausea and vomiting
- stomach cramps or diarrhea

Moderate poisoning:

- unable to walk
- weakness
- chest discomfort
- muscle twitches
- constriction of pupil of the eye
- earlier symptoms become more severe

Severe poisoning:

- unconsciousness
- severe constriction of pupil of eye
- muscle twitches
- secretions from mouth and nose
- breathing difficulty
- death if not treated

Illness may be delayed a few hours, but if signs or symptoms start more than 12 hours after exposure to a pesticide, you may have some other illness. Check with your physician to be sure.

Carbamates. The carbamates likely to poison you act almost like organophosphates. They produce the same signs and symptoms of poisoning, but the injury they cause is more easily treated by a physician. For this reason, carbamates are generally safer than organophosphates. The label will warn you of the level of danger.

Chlorinated Hydrocarbons. Few pesticide applicators have been poisoned by chlorinated hydrocarbons. Early signs and symptoms of poisoning include:

- headache
- nausea

- vomiting
- general discomfort
- dizziness

With more severe poisoning, convulsions follow. They may appear without the warning symptoms. Coma may follow the convulsions. The person also may be unusually excited or irritable.

Nitrophenols and Pentachlorophenol. The signs and symptoms of skin exposure include:

- redness
- burning
- blisters

The signs and symptoms of poisoning include:

- headache
- nausea
- gastric distress
- restlessness
- hot feeling
- flushed skin
- sweating
- deep and fast breathing
- fast beating of the heart
- fever
- ashen color
- collapse
- coma

Severe poisoning usually runs a rapid course. One usually dies or is almost well within 24 to 48 hours.

Fumigants and Solvents. Too much exposure to these compounds may make a person seem drunk. The signs and symptoms are:

- poor coordination
- slurring words
- confusion
- sleepiness

Repeated exposure to the fumigant methyl bromide has caused permanent internal injury without early signs or symptoms of poisoning. **You can absorb a fatal dose of methyl bromide before symptoms appear.**

Inorganic Pesticides

Large single doses of most inorganic pesticides cause vomiting and stomach pain. The signs and symptoms depend on the mineral from which the pesticide is made.

Plant-Derived Pesticides

Technical pyrethrum may cause allergic reactions. Some rotenone dusts irritate the respiratory tract. Nicotine is a fast-acting nerve poison about as dangerous as parathion. Some other very toxic plant-derived pesticides are strychnine and red squill.

First Aid for Pesticide Poisoning

First aid is the initial effort to help a victim before medical help arrives. Doing the right thing immediately could prevent serious illness - even death. What should you do?

The first step you should take in any poisoning emergency is to wash the poison off the victim to reduce exposure, then, *except if you are alone with the victim*, call an ambulance or physician, or both. *If you are alone with the victim*, see that the victim is breathing and that no further exposure occurs. If the victim is not breathing give artificial respiration.

If possible, take the pesticide container or label with you for the physician's information. Do not carry the container in the passenger space of a car or truck. If you cannot take the container, make sure you know what pesticide the victim has been using.

While you wait for the doctor or ambulance to arrive, give first aid as follows:

Poison on the Skin

The faster the poison is washed off the patient, the less injury will result.

- Remove clothing.
- Drench skin with water (shower, hose, faucet, pond, ditch).
- Thoroughly cleanse skin, hair and fingernails with detergent and water. (Detergents and commercial cleansers are better than soap.)
- Dry and wrap the victim in a blanket.
- **WARNING:** *If possible, do not allow any pesticide to get on you while helping the victim.*

Chemical Burns of the Skin

- Remove contaminated clothing.
- Wash with large quantities of running water.
- Immediately cover loosely with a clean, soft cloth.
- Avoid use of ointments, greases, powders and other drugs in first aid treatment of burns.

Poison in the Eye

You must wash the eye out as quickly, but as gently, as possible:

- Hold eyelids open and wash eyes with a gentle stream of clean running water.
- Continue washing for 15 minutes or more.
- Do not use chemicals or drugs in wash water. They may increase the extent of the injury.

Inhaled Poisons (dusts, vapors, gases)

- To rescue a victim from an enclosed space, use an air-supplied respirator. Otherwise, use extreme caution not to inhale the poison.
- Carry patient (do not let him walk) to fresh air immediately.
- Loosen all tight clothing.
- Apply artificial respiration if breathing has stopped or is irregular.
- Keep patient as quiet as possible.
- If patient is convulsing, watch his or her breathing and protect the victim from falling and striking head. Keep chin up so the air passage will remain free for breathing.
- Prevent chilling (wrap patient in blanket, but don't overheat).
- Do not give alcohol in any form.

Swallowed Poisons

The most important choice you must make when aiding a person who has swallowed a pesticide is whether you should make the victim vomit. The decision must be made quickly and accurately; the victim's life may depend on it. The "Statement of Practical Treatment" on each label will say whether or not to induce vomiting. If the container is not available, remember that usually it is best to get rid of the swallowed poison fast. But there are exceptions: *Never induce vomiting IF:*

- The victim is unconscious or in convulsions. The victim could choke to death.
- The victim has swallowed a corrosive poison. A corrosive poison will burn the throat and mouth as severely coming up

as it did going down. Identify the poison the person has ingested. A corrosive poison is a strong acid or alkali such as dinoseb, and the victim will complain of severe pain and have signs of severe mouth and throat burns.

- If the person has swallowed petroleum products (kerosene, gasoline, oil, lighter fluid). Concentrated petroleum products, like corrosive poisons, cause severe burns. If the victim has swallowed a diluted form of these products immediately induce vomiting.

How to Induce Vomiting if Recommended by Label. Do not waste a lot of time inducing vomiting. Use it only as first aid until you can get the victim to the hospital. Make sure the victim is lying face down or kneeling forward while vomiting. Do not let the victim lie on back because vomitus could enter the lungs and do more damage.

- First give the patient large amounts of milk or water — 1 to 2 cups for victims up to 5 years old, up to a quart for victims 5 years and older.
- Induce vomiting by putting your finger or the blunt end of a spoon at the back of a victim's throat or by using syrup of ipecac (use only on physician's orders). Do not use anything that is sharp or pointed! A glass of soapy water or salt water will also cause the victim to vomit.

Dilute Poison Quickly. The best first aid for a person who has swallowed a poison is to dilute and neutralize it as quickly as possible. Also, get the victim to a hospital without delay.

- For acid- or alkaline-based pesticides, give the victim milk or water — 1 to 2 cups for victims under 5 years; up to a quart for patients over 5 years. Milk is better than water because it dilutes and also neutralizes the poison while water only dilutes.
- If you are **sure** the poison is an acid, give the victim milk of magnesia (1 tablespoon to 1 cup of water), baking soda or chalk in water.
- If you are **sure** the poison is an alkali, give the patient lemon juice or vinegar.

"Universal Sponge". Use these "sponges" to absorb excess poisons only after first aid suggestions for the corrosive or noncorrosive poisons are followed: *Activated charcoal* — It absorbs many poisons at a high rate. Mix it with water into a thick soup for the victim to drink. Activated charcoal is found in aquarium filters or is available from a drug store. *Homemade absorber* — A homemade "universal sponge" used to absorb and neutralize most poisons is a mixture of 4 tablespoons of toast (burnt black), 2 tablespoons of strong tea (instant ice tea mix will do) and 2 tablespoons of milk of magnesia.

Shock

Sometimes poison victims go into shock. If untreated or ignored, shock can kill a victim even if the poisoning would not have been fatal.

Symptoms. The skin will be pale, moist, cold and clammy. The eyes will be vacant and lackluster with dilated (enlarged) pupils. Breathing will be shallow and irregular. The pulse will be very weak, rapid and irregular. The victim may be unconscious or in a faint. First aid steps follow:

- Unless victim is vomiting, keep the victim flat on his or her back with the legs raised 1 to 1½ feet above the head level.

- Keep the victim warm enough to prevent shivering. Do not overheat.
- If the victim is conscious and has not swallowed any poison, give small amounts of water or a dilute salt solution (½ teaspoon of table salt to 1 quart of water). Give as often as the victim will accept it.
- Keep the victim quiet and reassure him often.

Warnings

- Never try to give anything by mouth to an unconscious victim.
- In an emergency, use any source of fairly clean water such as irrigation canals, lakes, ponds, watering troughs, ditches, etc. Do not let the victim die while you worry about how dirty the water is.

First Aid Kit for Field and On-The-Job Use

A well equipped first aid kit that is always readily available can be important in a pesticide emergency. Make up your own Pesticide First Aid Kit in a lunch pail, tool box, tackle box or a sturdy wooden box. It should have a tight fitting cover with a latch. Clearly label it with paint or a waterproof marker. Contents:

1. A small plastic bottle of a common *detergent*, used to wash pesticides quickly off the skin.
2. A small plastic container of *salt* or *syrup of ipecac*. Salt is used with water to induce vomiting or to aid a person in shock.
3. A box or plastic container of *baking soda* or a bottle of *milk of magnesia*. These mixed with water will neutralize acidic chemicals that have been swallowed.
4. A plastic bottle of *lemon juice* or *vinegar*. These are used with water to neutralize basic or alkaline chemicals that have been swallowed.
5. A small package or bag of *activated charcoal*. Mixed with water and swallowed, activated charcoal acts as an absorber of all pesticides.
6. A shaped plastic airway for mouth-to-mouth resuscitation.
7. A thermos or large plastic bottle (at least one pint) of *clean water*. If there is no clean water, use any pond or stream water available.
8. Simple *adhesive bandages*, *a roll of gauze and tape*. All cuts and scrapes should be covered to prevent pesticides from easily entering the body.
9. *Change* for an emergency phone call should always be taped to the inside cover of the first aid kit.
10. An empty plastic container with a tight fitting lid is useful as a drinking glass for inducing vomiting or feeding activated charcoal. It also can be used to collect a sample of vomitus to take to a doctor.

Some of the preceding material was adapted from the Pesticide Applicator Training manual — Northeastern Regional Pesticide Coordinators.

Poison Control Centers

Poison Control Centers have been established to provide pertinent information on all types of poisonings. The centers provide to the medical profession current and accurate information concerning the prevention and treatment of pesticide poisonings on a 24-hour basis. The centers also will prescribe a course of action to take if local physicians are unavailable or unacquainted with antidotes for specified pesticides or other poisonous materials.

Idaho Poison Center
EMERGENCY SERVICE SYSTEM*
Toll Free Phone No.
1-800-632-8000

Poison Control Centers

IDAHO

Poison Control Center
 Emergency Room, St. Alphonsus Hosp.
 1055 North Curtis Road
 Boise, Idaho 83704
 (208) 376-1211

Poison Control Center
 Emergency Room, Idaho Falls Hosp.
 900 Memorial Drive
 Idaho Falls, Idaho 83401
 (208) 522-3620

Poison Control Center
 Emergency Room, St. Anthony Hosp.
 650 North 7th Street
 Pocatello, Idaho 83201
 (208) 232-2733

UTAH

Intermountain Regional Poison Control Center**
 50 North Medical Drive
 Salt Lake City, Utah 84100
 (801) 581-3711

WASHINGTON

Children's Orthopedic Hosp. & Medical Center**
 4800 Sandpoint Way N.E.
 Seattle, Washington 98100
 (206) 634-5252

Poison Information Center
 Deaconess Hospital
 West 800 5th Avenue
 Spokane, Washington 99210
 (509) 547-1077

*24-hour service links to all Poison Control Centers, hospitals and ambulances in the state.

**24-hour computer service direct to Bethesda, Maryland.

Issued in furtherance of cooperative Extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U. S. Department of Agriculture, James L. Graves, Director of Cooperative Extension Service, University of Idaho, Moscow, Idaho 83843. We offer our programs and facilities to all people without regard to race, creed, color, sex or national origin.