



Pesticide Certification Training Series

First Aid for Pesticide Poisoning

Jackie Lee

Pesticide Coordinator

Scott Schaeffer

Poison Control & Drug Information, Director

Oklahoma Cooperative Extension Fact Sheets
are also available on our website at:
<http://osufacts.okstate.edu>

Pesticides continue to be important tools in protecting our food and fiber from insects, diseases, weeds and rodents. They are also important in controlling insects and other pests that carry human diseases as well as maintaining our comfort by controlling biting and nuisance pests in both indoor and outdoor living areas. When properly used, pesticides are beneficial; but when misused, can be dangerous. Consequently, programs and resources exist for proper pesticide safety education to ensure proper use and instructions for handling situations when an emergency arises.

In nearly all poisoning cases due to pesticides, careless handling or improper storage was the cause. Every year, children lead the list of reported pesticide poisoning cases, according to information from the National Poison Data System. The same source reports that in 2013, pesticides were number eight out of 25 categories of products involved in poisonings of children less than five years old, and number seven for adults older than 20. Nearly all pesticide poisonings, in both children and adults, are caused by eating or drinking the product. Some pesticide applicators are killed when they breathe a pesticide or get it on their skin, but deaths from occupational exposure are now unusual. Pesticide accidents can be reduced by following a few basic safety rules.

Always read and follow all of the instructions on the label. Everything a person needs to know to apply the product safely is on the label. Read the entire label before purchasing the product and reread it again before mixing the product, before applying and before storing or disposing of unused portions of the pesticide or empty containers.

Besides instructions and precautions, the label has one of three "signal words" showing how dangerous or toxic the contents are to people (Table 1). Signal words and toxicity levels are determined by the LD₅₀ (the dose producing death in 50 percent of exposed test animals) of the pesticide. The lower the LD₅₀, the greater the toxicity of the pesticide. For example, a pesticide with an oral LD₅₀ of 500 would be much less toxic than a pesticide with an LD₅₀ of 5.

Recognizing Pesticide Poisoning

Be aware of the early symptoms of poisoning. The symptoms of pesticide poisoning may be similar to those of other types of poisoning and of some diseases. Heat exhaustion, food poisoning, asthma and other illnesses are sometimes

Table 1. Categories of Acute Toxicity

Categories	Signal Word Required on Label	LD ₅₀ * mg/kg	
		Oral	Dermal
Highly Toxic	Danger/ Danger Poison	0-50	0-200
Moderately Toxic	Warning	51-500	201-2,000
Slightly Toxic	Caution	501-5,000	2,001-20,000
Relative Non-Toxic	Caution	Over 5,000	Over 20,000

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

confused with pesticide poisoning. The pesticides associated with each chemical class of pesticides (i.e. organophosphates, carbamates, etc.) generally produce similar patterns of symptoms. The poisoning may be so mild that it can scarcely be detected, or it may become increasingly severe, depending upon the dose absorbed. One or more symptoms (headache, dizziness, nausea, etc.) may be common to many kinds of illnesses, whether caused by poisons or by viruses, bacteria, etc. It is not one or two symptoms, but the pattern of symptoms that makes it possible to tell one kind of poisoning from another. Some clues to pesticide poisoning are sensations that only the applicator is aware of, such as nausea or headache; others, like an ashen skin color or rash, can be noticed by others.

There are two kinds of pesticide poisoning. Acute poisoning occurs after exposure to a single dose of pesticide. The appearance of symptoms may be sudden and dramatic or may be delayed, but usually occur within 12 hours. Chronic poisoning occurs as the result of repeated, small, nonlethal doses through a longer period of time. Many symptoms may appear such as nervousness, slowed reflexes, irritability or a general decline of health.

The following are general symptoms of pesticide poisoning:

Mild poisoning or early symptoms of acute poisoning: headache, fatigue, weakness, dizziness, restlessness, nervousness, perspiration, nausea, diarrhea, loss of appetite, loss of weight, thirst, moodiness, soreness in joints, skin irritation and irritation of eyes, nose and throat.

Moderate poisoning or early symptoms of acute poisoning: nausea, diarrhea, excessive saliva, stomach cramps,

excessive perspiration, trembling, no muscle coordination, muscle twitches, extreme weakness, mental confusion, blurred vision, difficulty in breathing, coughing, rapid pulse, flushed or yellow skin and uncontrollable crying.

Severe or acute poisoning: fever, intense thirst, increased rate of breathing, vomiting, uncontrollable muscle twitches, pinpoint pupils, convulsions, inability to breathe and unconsciousness.

Medical doctors may be uninformed of the symptoms and treatment of pesticide poisoning because of the few cases which they treat. Commercial applicators or other large volume users should tell their doctor which of the pesticides (particularly the more toxic ones) they use, so the doctor will know the symptoms and the treatment and have antidotes on hand.

Since the late 1990s, the active ingredients in insecticides has changed from the organophosphate and carbamate insecticides to pyrethroid insecticides. The pyrethroid insecticides can cause a burning or pricking sensation of the skin and ingestion of some newer pyrethroids can cause seizures in small children and animals.

Always be sure to read labels before applying flea and tick treatments to companion animals. Especially check species (dog and cat) and weight indications.

First Aid for Pesticide Poisoning

First aid is the initial effort to assist a victim while medical help is on the way. The first step in any poisoning emergency is to call an ambulance or doctor, or both, except when alone with the victim. In this situation, make certain the victim is breathing and is not further exposed before leaving to make a phone call.

Take the pesticide container or label to the doctor. If this is not possible, make sure what pesticide the victim was using is known. Refer to the active ingredients statement on the label and write down the ingredients listed, as well as any information regarding treatment of persons exposed to the pesticide. Also copy the EPA Reg. No. found either at the front or at the very end of the pesticide's label.

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

Dilute Poison Quickly

The best first aid for a person who has swallowed a poison is to dilute the poison as quickly as possible by providing small sips of water – less than four (4) ounces and medical care without delay.

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, etc. Don't let the victim die while worrying about dirty water.

Shock

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

What to Do for Pesticide Poisoning

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).
- Cleanse skin and hair thoroughly with liquid detergent and water. (Detergents and commercial cleansers are better than soap.)
- Dry and wrap the victim in a blanket.

WARNING: If at all possible, do not allow any pesticide to get on you while you are 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.

Pesticides in the Eye

- It is most important to 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)

- If the victim is in an enclosed space, do not go in after them without an air-supplied respirator.
- Carry patient (do not let them walk) to fresh air immediately. Open all doors and windows.
- Loosen all tight clothing.
- Apply artificial respiration if breathing has stopped or is irregular. If the heart has stopped, perform cardiopulmonary resuscitation.
- Keep patient as quiet as possible.
- If patient is convulsing, watch their breathing and protect them from falling and striking their head. Keep their chin up so their air passage will remain free for breathing.
- Prevent chilling (wrap patient in blankets, but don't overheat). Do not give alcohol in any form.

Swallowed Poisons

- Poison Control and medical personnel do not recommend inducing vomiting.
- Usually the label will advise you in the First Aid Statement or Statement of Practical Treatment whether a person who has swallowed pesticide should be made to vomit. The Oklahoma Poison Control Center does not recommend inducing vomiting.

First Aid for Shock

- Unless the victim is vomiting, keep the victim flat on their back with their legs raised 1 to 1 ½ feet above their head level. Call 911!
- Keep the victim warm enough to prevent shivering. Do no overheat.
- If the victim is conscious and has not swallowed any poison, give small sips of water and call 911.
- Keep the victim quiet and reassure them often.

First Aid for Shock

- Unless the victim is vomiting, keep the victim flat on their back with their legs raised 1 foot to 1 ½ feet above their head level. Call 911!
- Keep the victim warm enough to prevent shivering. Do no overheat.
- If the victim is conscious and has not swallowed any poison, give small sips of water and call 911.
- Keep the victim quiet and reassure them often.

Symptoms

The skin will be pale, moist, cold and clammy. The eyes will be vacant and lackluster with dilated 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 Kit and On-the-Job Use

A well equipped first aid kit that is always readily available can be important in a pesticide emergency. It is possible to make a Pesticide First Aid Kit from a lunch pail, tool box or a sturdy wooden box. It should have a tight fitting cover with a latch so it won't come open or allow pesticides to leak inside. Label it clearly with paint or a waterproof marker.

Medical Antidotes

Medical antidotes are also available to neutralize the poisoning effects of a few pesticides. Taken improperly, however, these antidotes can be more dangerous than the effects of the pesticide. Medical antidotes should be prescribed or given only by a physician. There are no known antidotes for some pesticides.

Contents of First Aid Kit

1. A small plastic bottle of a common liquid detergent, used to wash pesticides quickly off the skin.
2. A shaped plastic airway for mouth-to-mouth resuscitation.
3. A thermos or large plastic bottle (at least 1 pint) of clean water.
4. Simple adhesive bandages, a roll of gauze and tape. All cuts and scrapes should be covered to prevent pesticides from easily entering the body.
5. A small, plastic, empty jar with a tight fitting lid is useful, and be used for collecting vomited matter to take to a doctor.

Poison Centers

A Poison Information Center has been established in Oklahoma to provide pertinent information on all types of poisoning, including pesticide poisoning. Post the number close to the phone and other locations at work. Enter the number in your cell phone, if desired. Give your doctor the number of the poison center and tell them what pesticides are going to be used. The doctor can then determine the poisoning symptoms and appropriate treatment and have antidotes on hand if a poisoning should occur.

A nationwide telephone number will connect the caller with the nearest Poison Information Center. The number is 1-800-222-1222.

Some of the preceding material was adapted from the Pesticide Applicator Training manual Northeastern Regional Pesticide Coordinators and the Illinois Pesticide Applicator Study Guide.

OKLAHOMA Center for Poison and Drug Information

Oklahoma Center for Poison and Drug Information
940 NE 13th
Oklahoma City, OK 73104
1.800.222.1222

The Oklahoma Cooperative Extension Service

Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education

for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.

- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, and Title IX of the Education Amendments of 1972 (Higher Education Act), the Americans with Disabilities Act of 1990, and other federal and state laws and regulations, does not discriminate on the basis of race, color, national origin, genetic information, sex, age, sexual orientation, gender identity, religion, disability, or status as a veteran, in any of its policies, practices or procedures. This provision includes, but is not limited to admissions, employment, financial aid, and educational services. The Director of Equal Opportunity, 408 Whitehurst, OSU, Stillwater, OK 74078-1035; Phone 405-744-5371; email: eeo@okstate.edu has been designated to handle inquiries regarding non-discrimination policies; Director of Equal Opportunity. Any person (student, faculty, or staff) who believes that discriminatory practices have been engaged in based on gender may discuss his or her concerns and file informal or formal complaints of possible violations of Title IX with OSU's Title IX Coordinator 405-744-9154.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 20 cents per copy. Revised 0615 GH.