



Pesticide Application Safety Training Program



Goal

The goal of this publication is to provide clear, easy-to-understand information on the safe handling, storage, and application of pesticides. It will also explain the symptoms of pesticide exposure and provide guidance on emergency first-aid treatment.

Objectives

The objectives of this training are to ensure employees are educated on the following topics:

- Routes of exposure and symptoms of pesticide poisoning.
- Proper procedures for storing, mixing, loading, and applying pesticides.
- Basic decontamination steps and first-aid procedures after pesticide exposure.
- The importance of personal protective equipment (PPE) and good hygiene when using pesticides.

General Information

Pesticides include a wide variety of substances that are used to control or eliminate pests. These substances can have serious effects on human health. For example, parathion (an insecticide) can be fatal to humans in doses as small as 0.004 of an ounce (about five drops). In comparison, piperonyl butoxide (a chemical used to make other pesticides more effective) can cause mild to severe symptoms of poisoning if about half an ounce is ingested.

Routes of Exposure

There are several ways that pesticides can enter your body. Understanding these routes can help prevent exposure and keep you safe.

Inhalation

Breathing in pesticide dust, vapors, mists, or gases is a significant risk. When inhaled, about 25% of the material is breathed out, 50% is swallowed after being deposited in the upper respiratory passages, and 25% reaches the lungs.

Skin Exposure

Pesticides can be absorbed through the skin and cause harmful effects. This can be as dangerous as inhalation. The severity of absorption depends on:

- The type of pesticide.
- The condition of your skin (broken skin absorbs chemicals more easily).
- Temperature (higher temperatures can increase absorption).
- How long you are exposed.
- How much skin is exposed.

Ingestion

Accidental swallowing of pesticides can happen in several ways:

- Pesticide splashing into the face or mouth.
- Eating food that has been contaminated by pesticides.
- Smoking while handling pesticides or using contaminated smoking materials.
- Rubbing your face with contaminated hands or gloves.



Eye Exposure

Exposure to the eyes usually occurs from accidental splashing or spilling of pesticides when proper eye protection is not worn. If pesticides are absorbed through the eyes, they can cause serious health issues, including symptoms affecting the blood system.

Pesticide Families and Symptoms

Pesticides can be grouped into different families, each with specific effects on health. Here are some common families:

Organo Phosphates (OPS)

OPS are chemicals commonly used in agriculture, landscaping, and mosquito control. They are also components of nerve gas. Examples include chlorpyrifos, diazinon, and malathion.

Symptoms:

- **Mild:** Headaches, dizziness, weakness, anxiety, blurry vision.
- **Moderate:** Nausea, excessive salivation, watering eyes, stomach cramps, vomiting, sweating.
- **Severe:** Diarrhea, small pupils, difficulty breathing, convulsions, coma.

Carbamates

Carbamates are insecticides that affect the nervous system of insects and animals. They are similar to OPS but are generally less toxic. Examples include carbaryl and propoxur.

Symptoms:

- **Mild:** Small pupils, excessive salivation, sweating.
- **Moderate:** Fatigue, muscle weakness, nausea, vomiting.
- **Severe:** Diarrhea, stomach pain, chest tightness.

Chlorinated Hydrocarbons (CHCs)

CHCs are chemicals made from chlorine, carbon, and hydrogen. Many, like DDT, are banned in the U.S. because they can cause cancer and harm the central nervous system. However, some CHCs, like Lindane, are still used for treating lice and scabies. Others are used as industrial solvents or in dry cleaning.

Symptoms:

- **Mild:** Nausea, vomiting.
- **Moderate:** Restlessness, tremors, anxiety.
- **Severe:** Coma, breathing failure, cancer, death.

Safe Storage of Pesticides

To store pesticides safely:

- Use tightly sealed containers with proper labels.
- Keep pesticides away from food, animal feed, and seeds.
- Store in a locked, clearly marked area.
- Avoid extreme temperatures, like freezing or overheating.

Proper Mixing and Loading

When mixing and loading pesticides:

- Always read the label first.
- Wear protective gear like gloves and goggles.
- Mix outdoors or in well-ventilated areas.
- Stand so the wind blows away from you.
- Use designated tools for opening the containers.
- Measure carefully—only use the amount specified.
- Keep containers below eye level to prevent splashing injuries.



Safe Application Practices

Follow these steps for safe pesticide application:

- Read the label and follow directions.
- Wear all required protective gear.
- Inspect your equipment for leaks or damage.
- Keep people and animals away from the area.
- Calibrate equipment to apply the correct amount.
- Only apply in good weather—avoid wind or rain.
- Be careful not to contaminate water sources.

Preventing Exposure

Take these precautions to avoid exposure:

- Never eat, drink, or smoke while handling pesticides.
- Do not touch your face with gloves or contaminated hands.
- Wear the right protective gear, such as coveralls, gloves, boots, goggles, and respirators.

- Wash your body and clothes thoroughly after handling pesticides.

First Aid for Pesticide Poisoning

If someone is exposed to pesticides:

- Clear the airway if they have trouble breathing. Give artificial respiration if needed.
- Wash the skin thoroughly to remove pesticides. Follow the directions on the Safety Data Sheet (SDS) or product label.
- If ingested, give the victim water with a small amount of baking soda (if they are conscious).
- Check the label or SDS for specific first-aid steps.
- Prevent contamination of medical personnel by ensuring the victim is cleaned before treatment.
- Take the victim to a doctor or hospital immediately.

Important: This information is a guide, not a replacement for professional medical care. Always get medical help for pesticide poisoning.

Pesticides are valuable substances to control pests, but their use comes with risks. By following proper safety practices for storage, handling, and application, and by being prepared for emergencies, you can protect yourself and others from harm. Always read labels, use protective equipment, and seek professional medical help if exposure occurs. Safety starts with awareness and careful action.

Review Questions

1. What percentage of inhaled pesticide material typically reaches the lungs?
 - a. 10%
 - b. 25%
 - c. 50%
 - d. 75%
2. Which of the following is NOT a common route of pesticide exposure?
 - a. Inhalation.
 - b. Skin contact.
 - c. Ingestion.
 - d. Injection.
3. What is a symptom of mild exposure to Organo Phosphates (OPS)?
 - a. Diarrhea.
 - b. Convulsions.
 - c. Blurry vision.
 - d. Coma.
4. When mixing and loading pesticides, you should:
 - a. Stand so the wind blows toward you.
 - b. Use any available tools to open containers.
 - c. Mix indoors for better concentration.
 - d. Keep containers below eye level.
5. Which of the following is a safe practice when applying pesticides?
 - a. Apply during windy conditions for better coverage.
 - b. Calibrate equipment to apply the correct amount.
 - c. Wear minimal protective gear for comfort.
 - d. Allow people and animals into the area during application.

Answers: 1. b) 25%; 2. d) Injection; 3. c) Blurry vision; 4. d) Keep containers below eye level; 5. b) Calibrate equipment to apply the correct amount



www.txsafetyatwork.com

1-800-252-7031, Option 2

*The Texas Department of Insurance,
Division of Workers' Compensation (DWC)-Workplace Safety
P.O. Box 12050
Austin, TX 78711-2050*

Disclaimer: Unless otherwise noted, this document was produced by the Texas Department of Insurance, Division of Workers' Compensation using information from staff subject specialists, government entities, or other authoritative sources. Information contained in this fact sheet is considered accurate at the time of publication. For more free publications and other occupational safety and health resources, visit www.txsafetyatwork.com, call 800-252-7031, option 2, or email resourcecenter@tdi.texas.gov.