

# Pesticide Poisoning

To be used along with Handout HS97-115D

*Texas Department of Insurance  
Division of Workers' Compensation*

***Safety Education & Training Programs***

HS97-115D (10-05)



## *Goal*

This presentation provides information on the symptoms of pesticide exposure and possible emergency first-aid treatment. It is not a substitute for medical intervention.

The slide features a dark brown background with six decorative circles arranged in a horizontal line at the top. The circles alternate between being solid and hollow. The word "Objectives" is written in white, italicized font on the left side of the slide.

## *Objectives*

The objectives of this program are to provide workers exposed to pesticides with basic information on routes of intoxication, symptoms of poisoning by three classes of pesticides, basic decontamination procedures, and basic first-aid procedures.

## *General*

Pesticides are a diverse group of substances with a potential for varied toxic effects. For example, parathion is lethal to humans in doses of 0.004 oz. (about five drops) but it takes about half an ounce of piperonyl butoxide to cause acute symptoms of poisoning when ingested. With many pesticides, the possibility of skin exposure with subsequent absorption may present almost as great a danger to the worker as inhalation. Remember that skin exposure and inhalation can occur concurrently.

# *Inhalation*

The inhalation of pesticide dusts, vapors, mists, and gases may represent a significant occupational hazard. Dust hazards may involve the loading, mixing, and application of insecticides in powder or granular form.

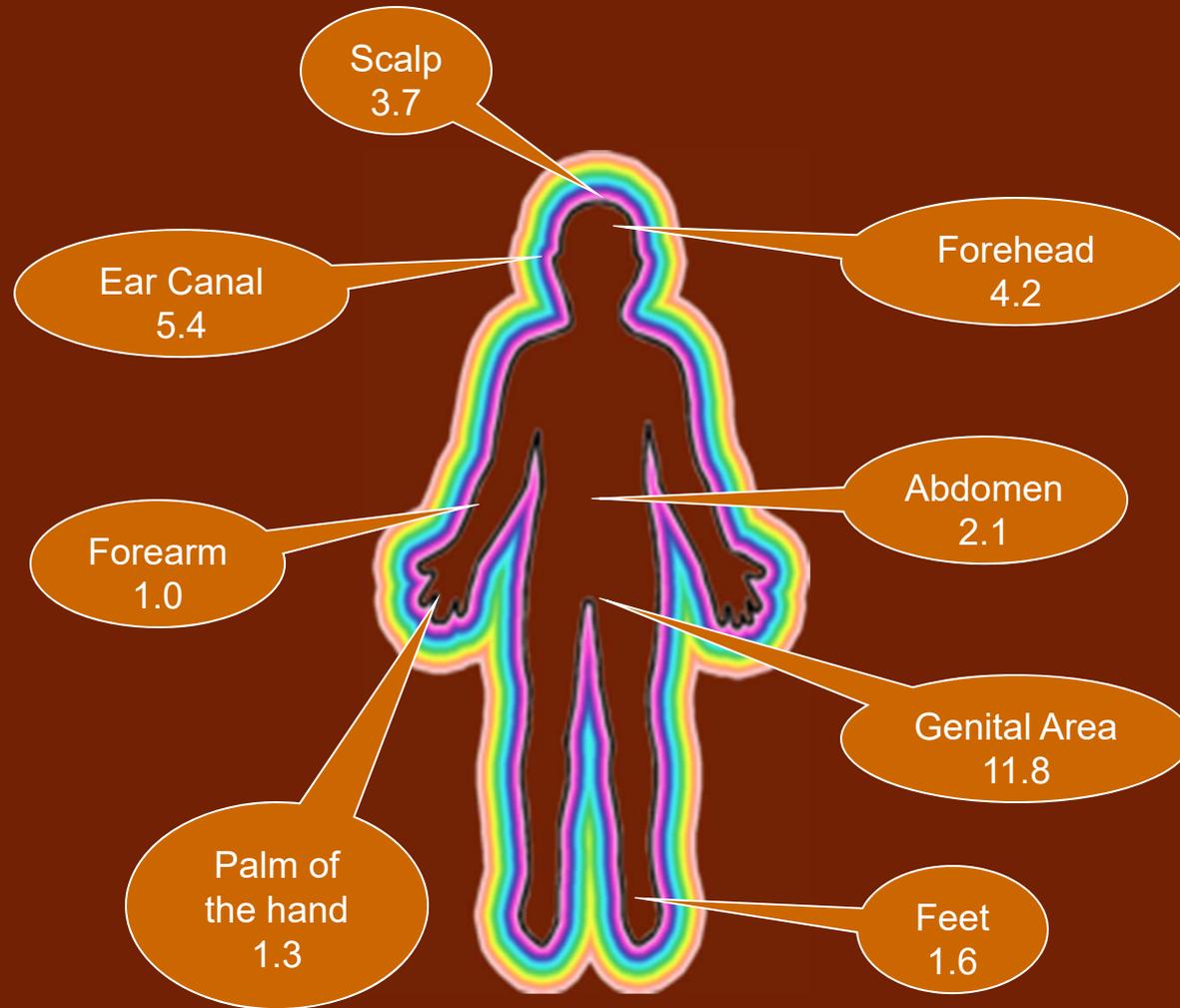
**The finer the dust, the greater the potential problem.**

Medical research has shown that about 25 percent of inhaled material is exhaled, about 50 percent is deposited in the upper respiratory passages and subsequently swallowed, and 25 percent is deposited in the lower respiratory passages of the lungs.

# *Dermal (Parenteral) Exposure*

Dermal exposure presents almost as great a potential for absorption as inhalation. The absorption rate through the skin is determined by the nature of the pesticide, condition of the exposed skin, and external factors such as temperature, duration of exposure, and the area exposed. Rapid absorption occurs in pesticides that are soluble both in water and in oils. The rate of absorption can be significantly high if the skin is irritated or dry or chapped from excessive washing with solvents. Other factors that may increase absorption are sweating and increased blood circulation.

**Absorption rates for various parts of the body, compared to forearm  
which is 1.0 based on **Milligrams/Centimeter squared (mg/cm<sup>2</sup>)**.**



# *Ingestion (Swallowing) Exposure*

Accidental ingestion of chemicals can occur in several ways. Ingestion may occur through accidental

1. **splashing of chemicals** in the face and mouth,
2. **eating contaminated food,**
3. using **contaminated smoking materials,**
4. or by **rubbing the face with contaminated hands or gloves.**

Personal hygiene is important when working with pesticides. The degree of hazard from ingesting pesticides is related to the toxicity of the materials, their solubility, and the specific portion of the gastrointestinal tract involved.

## *Ocular (Eye) Exposure*

Ocular exposure is usually the result of **accidental splashing or spilling a pesticide while not wearing eye protection**. Acute local effects may be produced in associated eye structures such as burns to the eyelid and conjunctiva. It should be noted that **sufficient material may be absorbed through the eyes to produce acute blood system effects**.

# *Pesticide Families and Symptoms*

## **Organo Phosphates**

These pesticides are cholinesterase inhibitors (nerve poisons) and range in toxicity from mild to acutely toxic. For the most part, these pesticides break down rapidly in the environment. This family of pesticides includes: Chlorpyrifos (Dursban), diazinon, dichlorvos (DDVP), dimethoate (Cygon), fenthion (Baytex, Entox), raboron (Gardona), malathion, methyl parathion, naled (Dibrom), ronnel (Korian), and triehlonfon (Dipterex).

# Organo Phosphates (cont...)

## Symptoms may include

1. ***mild exposure*** - headaches, dizziness, weakness, anxiety, nervousness, impaired vision
2. ***moderate exposure*** - nausea, salivation (slobbering), watering eyes, abdominal cramps, vomiting, sweating, slow pulse, muscular tremors
3. ***severe exposure*** - diarrhea, constricted and nonreactive pupils, vision or respiratory difficulties, cyanosis (bluish color to face and hands), loss of bowel and bladder control, convulsions, coma and death.

# *Pesticide Families and Symptoms*

## **Carbamates**

- These pesticides also are cholinesterase inhibitors (nerve poisons) and range in toxicity from low to mild toxicity. This pesticide family includes carbaryl (Sevin), dimetilan, landrin,
- carbofuran, propoxur (Baygon), and methiocarb (Bay 37344).

## Carbamates (cont...)

### Symptoms may include

- ***mild exposure*** - constricted pupils, salivation (slobbering), profuse sweating
- ***moderate exposure*** - fatigue, uncoordinated muscles, nausea, vomiting
- ***severe exposure*** - diarrhea, stomach pain, tightness in the chest.

# *Pesticide Families and Symptoms*

## **Chlorinated Hydrocarbons**

Many of these pesticides are now banned for use in the United States. However, some of these insecticides are still used in other countries and are illegally brought into the United States. In general, these insecticides affect the central nervous system and, depending on the compound, can depress or stimulate the central nervous system. This pesticide family includes Aldrin, BHC, **Chlordane, DDT**, Dieldrin, Heptachlor, Lindane, Mirex, and **Toxaphene**

# Chlorinated Hydrocarbons (cont...)

Symptoms may include

1. ***mild exposure*** - nausea, vomiting
2. ***moderate exposure*** - restlessness, tremors (shakes), apprehension (fear), convulsions
3. ***severe exposure*** - coma, respiratory failure, death.

# ***General First Aid for Pesticide Poisoning... **First: call for help*****

- Keep airway clear; provide artificial respiration if necessary; use oxygen if available to support breathing. Death from pesticide poisoning is usually due to respiratory failure.
- Decontaminate the victim as indicated by the safety data sheet (SDS) or label. Remove all contaminated clothing, wash skin, hair, hands, and face with soap and water. If eyes are involved, flush eyes with clean water for a minimum of 15 minutes or until medical help arrives.

# ***General First Aid for Pesticide Poisoning***

- It is generally recommended that if poison was ingested, and the person is not vomiting and is fully conscious, give the person water with 5 percent sodium bicarbonate (baking soda). Follow CSO instructions!
- Consult the insecticide label or SDS for active ingredients and specific first-aid treatment.

# ***General First Aid for Pesticide Poisoning***

- If a mixture of organophosphates and chlorinated hydrocarbons are involved (DDVP and Mirex), first give specific treatment for organo phosphates. Then give the indicated support therapy and decontamination procedures, as indicated by the label or safety data sheet.

# ***General First Aid for Pesticide Poisoning***

- Protect medical personnel from contamination. Call 911 or the local emergency medical service as soon as possible. The Texas Poison Center Network (1-800-764-7661 or 1-800-poison-1), may also be contacted for assistance in determining the proper first-aid treatment.

# ***General First Aid for Pesticide Poisoning***

- Transport the victim to a medical facility as soon as possible.
- If a person has been exposed to a pesticide, begin first-aid treatment and decontamination procedures, then transport the victim to a medical facility.

# Resources

- The Texas Department of Insurance/Division of Workers' Compensation Resource Center offers a workers' health and safety video tape library. Call (512) 804-4620 for more information or visit our web site at: [www.tdi.state.tx.us/wc/indexwc.html](http://www.tdi.state.tx.us/wc/indexwc.html)
- Disclaimer: *Information contained in this training program is considered accurate at time of publication.*
- **Safety Violations Hotline 1-800-452-9595**
- [safetyhotline@tdi.state.tx.us](mailto:safetyhotline@tdi.state.tx.us)