

BASICS

Organochlorine **PESTICIDES** are synthetic substances used all over the world to control insect pests. Some well-known examples include DDT, dieldrin, methoxychlor, chlordane, mirex, kepone, and lindane.

Organochlorines become more toxic as the temperature decreases making them toxic to cold-blooded animals such as insects. They are **NEUROTOXINS** that leave the pests unable to move or breathe. However, they can affect non-target species including humans, as they accumulate in the food chain.

CLINICAL SIGNS most commonly affect the Central Nervous System (CNS) and can range from vomiting and dizziness to stumbling and seizures. Affected animals may also show signs of respiratory and cardiac distress, and impaired liver function. Large exposures and severe toxicity lead to seizures with **RESPIRATORY FAILURE AND DEATH**.

Organochlorines typically **CONTAMINATE** the environment through pesticide use and wastes discharge from industrial units that make the chemicals. **TRANSMISSION** can be orally, through skin absorption, or inhalation. Some of these chemicals can bind to the soil and air, increasing the chances of persisting in the environment.

When ingested, organochlorines are **ABSORBED QUICKLY** and infiltrate the nervous system, but they then circulate in blood and **ACCUMULATE** in fat where they persist for prolonged periods. Compounds may be broken down by the liver into secondary chemicals that are also toxic.

DIAGNOSIS of organochlorine levels in serum, urine or tissues can be detected by laboratory testing, but the tests are not often readily available.

The **TREATMENT** of organochlorine poisoning varies based on method of absorption. Controlling the respiratory distress and preventing seizures are the major priorities.



**INGESTION,
INHALATION,
OR DIRECT
CONTACT**

**ALL
SPECIES**

DETAILS

These chemical substances are in general non-volatile solids at room temperature, have high persistence, low polarity, low aqueous solubility and high lipid solubility. Their common effect on the Central Nervous System (CNS) is stimulation, and they are identified as **AGENTS OF CHRONIC EXPOSURE** to animals and humans alike.

CLINICAL SIGNS Some of these chemicals, like cyclodienes and toxaphene, can cause sudden seizures from 1 to 6 hours after exposure and the signs can persist for days. In addition, aspiration pneumonitis, or inflammation of the lungs due to aspiration, is a possible complication since most organochlorines contain petroleum-based solvents or hydrocarbons. Organochlorines can also **INCREASE THE RISK** of sudden death due to heart attack.

Organochlorines are typically well-absorbed orally and then undergo considerable liver metabolism. Skin absorption is possible, but not the same for every compound: some penetrate the skin very well while others do not. Inhaling these chemicals is also potentially harmful but is not usually a major contributor to cases of organochlorine pesticide poisoning.

Even though pesticides are developed with specific species in mind, they can often affect non-target species through **ACCUMULATION IN THE ENVIRONMENT**. Exposure to smaller amounts of organochlorines over longer periods of time can have detrimental effects.

In the 1970s the use of organochlorines such as DDT, resulted in **REPRODUCTIVE FAILURE** in some bird species because the pesticide caused them to lay eggs with shells that were too thin—leaving the eggs prone to cracking before hatching. This is in addition to the individual animals themselves dying from the chronic “exposure” to the poison.

TREATMENT In case of skin contact, the patient’s skin should be thoroughly cleaned using soap and water. If the ingestion was extremely recent and the patient is still asymptomatic, using activated charcoal can help prevent absorption and encourage elimination from the GI tract.

When seizures do take place in these cases, they need to be managed by preserving the airway and maintaining oxygen flow. General anticonvulsants should be used but phenytoin is usually ineffective for toxin-induced seizures.

PRECAUTIONS AND PREVENTION Many compounds that fall under the organochlorine category are banned from use in the United States. However, these compounds persist in the environment for decades, and cases may occur in areas where they were previously applied.

