

ACUTE EFFECTS, DIAGNOSIS, AND TREATMENT OF PESTICIDE INJURIES

ACUTE SYMPTOMS	PESTICIDE CATEGORY	CHEMICAL EXAMPLES	PHYSIOLOGICAL TARGET	(D)IAGNOSIS (T)REATMENT
Vomiting, diarrhea, hypersecretion, confusion, bronchoconstriction, headache, dizziness, impaired vision, weakness, stomach cramps, cholinergic crisis, miosis, fatigue	Organophosphates	Chlorpyrifos, diazinon, methyl parathion, malathion, azinphos-methyl, naled, glyphosate	Irreversibly inhibits acetylcholinesterase resulting in muscarinic and nicotinic effects	D: Cholinesterase levels T: Supportive care, clear airway, improve tissue oxygenation, intravenous atropine, pralidoxime may be indicated, decontamination
Malaise, muscle weakness, CNS depression, dizziness, nausea, vomiting, diarrhea, abdominal pain, blurred vision, hypersecretion, bronchoconstriction, headache	N-Methyl Carbamates	Carbaryl, aldicarb, fenoxycarb, methomyl, bendiocarb	Reversibly inhibits acetylcholinesterase resulting in muscarinic and nicotinic effects	D: Cholinesterase levels T: Supportive care, clear airway, improve tissue oxygenation, intravenous atropine, decontamination
Allergic reactions, anaphylaxis, tremor, ataxia at very high doses	Pyrethrins	Pyrethrum	Neuronal paralysis, sensitization	D: No diagnostic test T: Decontamination, treat allergic reactions with antihistamines or steroids, as needed
Dizziness, irritability to sound or touch, headache, vomiting, diarrhea, blurred vision	Pyrethroids Type I	Allethrin, permethrin, sumethrin, cyfluthrin, tetramethrin	Interference with sodium channel in neuronal cell membranes—repetitive neuronal discharge	D: No diagnostic test T: Decontamination, supportive care, symptomatic treatment
Seizures, dizziness, irritability to sound or touch, headache, vomiting, diarrhea, paresthesias	Pyrethroids Type-II (cyano-pyrethroids)	Deltamethrin, cypermethrin, fenvalerate	Interference with sodium channel and inhibition of gamma-aminobutyric acid (GABA)	D: Note: Skin contact may cause highly unpleasant, temporary paresthesias T: Best treated with Vitamin E oil preparations
Incoordination, tremors, paresthesia, hyperesthesia, headache, dizziness, nausea, hyperexcitable state, seizures	Organochlorines	Lindane, endosulfan, dicofol, methoxychlor	Blockade of chloride channel in the GABA receptor complex	D: Detectable in blood and fat T: Decontamination, supportive care, anticonvulsants, cholestyramine to clear enterohepatic recirculation, oxygen, cardiopulmonary monitoring
Nausea and vomiting, diarrhea, headache, confusion, bizarre behavior, peculiar breath odor, myotonia, low fever, acidosis, EKG changes, CPK elevation, myoglobinuria	Chlorophenoxy compounds	2,4-Dichlorophenoxyacetic acid (2,4-D), 2,4-DB, 2,4-DP	Peripheral neuropathy, myopathy, metabolic acidosis, skin and mucus membrane irritant, uncoupler of oxidative phosphorylation	D: Detectable in urine and blood T: Decontamination, hydration, forced alkaline diuresis
Pain, diarrhea, headache, myalgias, acute tubular necrosis, delayed pulmonary edema Neurologic toxicity from diquat	Dipyridyl compounds	Paraquat, diquat	Corrosive, free radical formation, lipid peroxidation, selective damage to pneumocytes	D: Urine dithionite test (colorimetric), detectable in urine and blood T: Decontamination, do not administer oxygen unless patient develops severe hypoxemia, aggressive hydration, hemoperfusion
Nosebleeds, bleeding gums, hematuria, melena, ecchymoses, anemia, fatigue, dyspnea	Anticoagulant Rodenticides	Warfarin, brodifacoum, difenacoum, coumachlor, bromadiolone	Antagonize vitamin K, inhibition of clotting factors	D: Elevated PT and INR T: Vitamin K1 (phytonadione), administration, control seizures
Nose, throat & eye irritation, dermatitis, muscle spasm, abdominal pain, fever, tremor, thirst, sweating, tachycardia, hyperthermia, chest constriction, labored breathing, mental confusion	Chlorophenols	Pentachlorophenol (PCP, Penta)	Uncouples oxidative phosphorylation, skin and mucus membrane irritant	D: Detectable in blood and urine T: Decontamination, supportive care, control hyperthermia, cardiopulmonary monitoring
Hyperthermia, tachycardia, tachypnea, anxiety, confusion, thirst, sweating, fever, headache, malaise	Nitrophenols and Nitrocreosols	Dinocap	Uncouples oxidative phosphorylation; Affect hepatic, renal and nervous systems	D: Detectable in serum, bright yellow staining of skin and urine T: Supportive care, decontamination, control hyperthermia
Headache, dizziness, nausea, ataxia, tremor, agitation, muscle weakness, visual disturbances, slurred speech, vomiting, seizures, respiratory distress, pulmonary edema, convulsions	Fumigants	Methyl bromide	Irritant, inhibits sulfhydryl enzymes and reversibly breaks down ATP CNS depressant	D: Blood or urine bromide levels T: Supportive care, decontamination, benzodiazepines, dimercaprol, oxygen & diuresis for pulmonary edema
Eye, lung & mucus membrane irritation, pulmonary edema	Fumigants	Metam sodium	Decomposes in water to methyl isothiocyanate, severely irritant gas	D: No diagnostic test T: Supportive care, decontamination