

## Index of Signs and Symptoms of Acute Poisoning

This index provides a table of pesticides and their related symptoms and signs and affected organ systems in poisoned individuals. This may be useful in raising the index of suspicion for pesticide toxicity where these signs and symptoms occur. Such suspicion can be evaluated further within the differential diagnosis as appropriate.

It is important to keep in mind that the signs and symptoms listed have multiple causes, pesticidal and nonpesticidal. In addition, no specific symptoms or signs are invariably present in poisonings by particular pesticides. Toxicological presentation may vary based on dosage, route(s) of exposure, life stage of the patient, and patient's genetic vulnerability, co-exposures and/or underlying health status. This complexity may explain why many poisonings are characterized by unexpected or atypical manifestations.

### *Common symptoms were not included:*

- *malaise*
- *fatigue*
- *dizziness*
- *nausea*
- *vomiting*

*It is important to keep in mind that the signs and symptoms listed have multiple causes, pesticidal and nonpesticidal.*

The table does not differentiate clinical presentation by route of exposure or dosage. For example, effects of high-dose ingestion are not distinguished from effects of relatively low-dose dermal absorption, nor are topical effects distinguished from systemic dermal manifestations. Such details are addressed more fully in the chapters addressing the specific pesticides, which make up the bulk of this manual. The list of pesticides in this chapter is intended to serve as a clue for the clinician toward further inquiry.

The word “poisoning” is used loosely in these headings to include topical as well as systemic effects that are acute manifestations rather than delayed sequelae or chronic conditions, although in some cases acute effects may persist. For chronic health conditions including long-term sequelae after acute poisoning and chronic conditions associated with lower level, repeat exposures, see **Chapter 21, Chronic Effects**.

Pesticides that are relatively consistent in causing particular manifestations are listed in the column headed “Characteristic of These Poisonings.” Agents that are associated with conditions less consistently or are less prominent features of poisoning are listed in the right-hand column, headed “May Occur in These Poisonings.” Obviously, the distinction is not always clear cut.

Some symptoms (malaise, fatigue, dizziness, nausea and vomiting) occur so commonly in poisoned individuals that they have little or no value in differential diagnosis, and are therefore not included in these tables.

SYSTEM: General/Non-Specific	SYMPTOMS/ SIGNS/DISEASE CATEGORIES	CHARACTERISTIC OF THESE POISONINGS	MAY OCCUR IN THESE POISONINGS
	Rotten egg odor	Sulfur	
	Hypothermia	Creosote	
	Hyperthermia (fever, pyrexia)	Nitrophenols Pentachlorophenol	Borate Thallium Metaldehyde Inorganic arsenicals Chlorophenoxy compounds Cadmium dusts Naphthalene
	Chills	Phosphine Arsine	
	Hot sensations	Nitrophenols Chlordimeform	Pentachlorophenol
	Myalgia	Paraquat Chlorophenoxy compounds	
	Thirst	Pentachlorophenol Nitrophenols Inorganic arsenicals Phosphorus Phosphides Sodium Fluoride Cholecalciferol Aminopyridine	Borate Endothall
	Anorexia	Organophosphates N-methyl carbamates Nicotine Pentachlorophenol Hexachlorobenzene Chlordimeform Cholecalciferol	Halocarbon fumigants Nitrophenols Inorganic arsenicals Amino pyridine
	Alcohol intolerance	Thiram Calcium cyanamide	
	Sweet taste in the mouth	Chlordimeform	
	Metallic taste in the mouth	Inorganic arsenicals Organic mercury	
	Salty, soapy taste In the mouth	Sodium fluoride	

**General and  
Non-Specific**

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**Skin**

<b>SYSTEM: Skin</b>	<b>SYMPTOMS/ SIGNS/DISEASE CATEGORIES</b>	<b>CHARACTERISTIC OF THESE POISONINGS</b>	<b>MAY OCCUR IN THESE POISONINGS</b>
	Irritation, rash, blistering, or erosion (without sensitization)	Copper, organotin, and cadmium compounds Metam sodium Paraquat Diquat Sodium chlorate Phosphorus Sulfur Thiram Chlordimeform Cationic detergents Hexachlorophene Ethylene oxide Formaldehyde Acrolein Methyl bromide Ethylene dibromide Dibromochloropropane Dichloropropane Endothall Aliphatic acids	Pentachlorophenol Picloram Chlorophenoxy Captan Rotenone Diethyltoluamide (DEET) Creosote Fungicides Herbicides with irritant properties Petroleum distillate
	Contact dermatitis	PCP Paraquat DEET Chlorhexidine Creosote Hexachlorophene Pyrethrins/pyrethroids Chlorothalonil Thiram Thiophthalimides Propachlor Propargite Ethylene oxide	Barban Captafol Formaldehyde
	Flushing	Cyanamide Nitrophenol	Thiram plus alcohol
	Beefy red palms, soles	Borate	
	Urticaria	Chlorhexidine PCP DEET	Fluoride Pentachlorophenol
	Bullae	Liquid fumigants	Hexachlorobenzene
	Pallor	Organochlorines Fumigants Sodium fluoride Creosote	Coumarins Indandiones

SYSTEM: Skin, cont.	SYMPTOMS/ SIGNS/DISEASE CATEGORIES	CHARACTERISTIC OF THESE POISONINGS	MAY OCCUR IN THESE POISONINGS
	Cyanosis	Sodium chlorate Paraquat Cadmium dusts Sodium fluoroacetate Strychnine Crimidine Nicotine Organochlorines	Organophosphates N-methyl carbamates
	Yellow stain	Nitrophenols	
	Keratoses, brown discoloration	Inorganic arsenicals	
	Ecchymoses	Coumarins Indandiones	Phosphorus Phosphides
	Jaundice	Carbon tetrachloride Chloroform Phosphorus Phosphides Phosphine Paraquat Sodium chlorate	Inorganic arsenicals Diquat Copper compounds
	Excessive hair growth		Hexachlorobenzene
	Loss of hair	Thallium	Inorganic arsenicals
	Loss of fingernails		Paraquat Inorganic arsenicals
	Brittle nails, white striations	Inorganic arsenicals	Thallium
Sweating, diaphoresis	Organophosphates N-methyl carbamates Nicotine Pentachlorophenol Naphthalene Aminopyridine	Copper compounds	

## Skin

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**Signs and Symptoms**

**Eye**

<b>SYSTEM: Eye</b>	<b>SYMPTOMS/ SIGNS/DISEASE CATEGORIES</b>	<b>CHARACTERISTIC OF THESE POISONINGS</b>	<b>MAY OCCUR IN THESE POISONINGS</b>
	Conjunctivitis (irritation of mucous membranes, tearing)	Chloropicrin Acrolein Copper compounds Organotin compounds Cadmium compounds Metam sodium Paraquat Diquat Acrolein Chloropicrin Sulfur dioxide Naphthalene Formaldehyde Ethylene oxide Methyl bromide Endothall Toluene Xylene Fipronil	Thiophthalimides Thiram Thiocarbamates Pentachlorophenol Chlorophenoxy compounds Chlorothalonil Picloram Creosote Aliphatic acids Strobilurin fungicides Pyrethrins
	Lacrimation (muscarinic)	Organophosphates N-methyl carbamates	
	Yellow sclerae	Nitrophenols	Agents that cause jaundice (see section on Skin)
	Keratitis	Paraquat	
	Ptosis	Thallium	
	Diplopia	Organophosphates N-methyl carbamates Nicotine	
	Photophobia		Organotin compounds
	Constricted visual fields	Organic mercury	
	Optic atrophy		Thallium
	Miosis	Organophosphates N-methyl carbamates	Nicotine (early)
Dilated pupils	Cyanide Fluoride	Nicotine (late)	
Non-reactive pupils	Cyanide		

SYSTEM: Nervous System	SYMPTOMS/ SIGNS/DISEASE CATEGORIES	CHARACTERISTIC OF THESE POISONINGS	MAY OCCUR IN THESE POISONINGS
	Paresthesia	Pyrethroids Organochlorines Inorganic arsenicals Organic mercury Carbon disulfide Pyriminil	Organophosphates Thiabendazole Phosphides Sodium fluoroacetate Thallium
	Headache	Organophosphates N-methyl carbamates Nicotine Inorganic arsenicals Organic mercury Cadmium compounds Organotin compounds Copper compounds Thallium Fluoride Borates Naphthalene Phosphine Halocarbon fumigants Creosote Diquat Cholecalciferol Cyanamide Neonicotinoids Fipronil	Organochlorines Nitrophenols Thiram Pentachlorophenol Paraquat DEET
	Behavioral – mood disturbances (confusion, excitement, mania, disorientation, emotional lability)	Organic mercury Inorganic arsenicals Organotin compounds Thallium Nicotine Sodium fluoroacetate Diquat Cyanide Nitrophenols Aminopyridine Carbon disulfide Methyl bromide Fipronil	Organophosphates N-methyl carbamates Pentachlorophenol Sodium fluoride DEET Organochlorines Neonicotinoids

**Nervous System**

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**Signs and Symptoms**

**Nervous System**

SYSTEM: Nervous System, cont.	SYMPTOMS/ SIGNS/DISEASE CATEGORIES	CHARACTERISTIC OF THESE POISONINGS	MAY OCCUR IN THESE POISONINGS
	Depression, stupor, coma	Organophosphates N-methyl carbamates (particularly in children) Sodium fluoride Borate Diquat Fipronil Avermectins	Inorganic arsenicals Metaldehyde Sulfuryl fluoride Halocarbon fumigants Phosphorus Phosphine Paraquat Chlorophenoxy compounds DEET Alkyl phthalates
	Seizures/convulsions (clonic-tonic) sometimes leading to coma	Organochlorines Strychnine Crimidine Sodium fluoroacetate Nicotine Cyanide Acrylonitrile Metaldehyde Thallium DEET Chlorobenzilate Carbon disulfide Phosphine Povidone-iodine Hexachlorophene Sodium chlorate Creosote Endothall Fluoride	Nitrophenols Pentachlorophenol Inorganic arsenicals Organotin compounds Diquat Borate Sulfuryl fluoride Methyl bromide Chlorophenoxy compounds Organophosphates N-methyl carbamates Aminopyridine Fipronil
	Muscle twitching/fasciculation	Organophosphates N-methyl carbamates Nicotine Sulfuryl fluoride Pyrethroids	Organic mercury Chlorophenoxy compounds
	Myotonia		Chlorophenoxy compounds
Tetany, carpopedal spasms	Fluoride Phosphides Phosphorus		

SYSTEM: Nervous System, cont.	SYMPTOMS/ SIGNS/DISEASE CATEGORIES	CHARACTERISTIC OF THESE POISONINGS	MAY OCCUR IN THESE POISONINGS
	Tremor	Organic mercury Thallium Organophosphates N-methyl carbamates Nicotine Metaldehyde Borates Neonicotinoids Pyrethroids	Pentachlorophenol Nitrophenols Thiram
	Incoordination (including ataxia)	Halocarbon fumigants Organophosphates N-methyl carbamates Carbon disulfide Nicotine Thallium	Organic mercury Organochlorines Chlorobenzilate
	Paralysis Paresis, muscle weakness	Inorganic arsenicals Organophosphates N-methyl carbamates Nicotine Neonicotinoids	Organic mercury DEET
Hearing loss	Organic mercury		

SYSTEM: Cardiovascular	Hypotension and shock	Phosphorus Phosphides Phosphine Sodium fluoride Sodium chlorate Borate Thallium Copper compounds Endothall Cyanamide	Inorganic arsenicals Nicotine (late) Creosote Alkyl phthalate Cycloheximide Formaldehyde
	Hypertension	Thallium (early) Nicotine (early)	Organophosphates
	Cardiac arrhythmias	Sodium fluoroacetate Halocarbon fumigants Nicotine Sodium fluoride Ethylene oxide Sodium chlorate Thallium-ventricular Povidone-iodine Veratrum alkaloid (sabadilla) Neonicotinoids	Inorganic arsenicals Phosphorus Phosphides Phosphine Organochlorines Cyanide Acrylonitrile Fluoride

## Nervous System

## Cardiovascular System

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**Cardiovascular System**

SYSTEM: Cardio, cont.	SYMPTOMS/ SIGNS/DISEASE CATEGORIES	CHARACTERISTIC OF THESE POISONINGS	MAY OCCUR IN THESE POISONINGS
	Bradycardia (sometimes to asystole)	Cyanide Organophosphates N-methyl carbamates	Nicotine (late)
	Tachycardia	Nitrophenols Cyanamide Nicotine (early) Neonicotinoids	Metaldehyde Organophosphates (early, before bradycardia) Pentachlorophenol

**Respiratory System**

SYSTEM: Respiratory	SYMPTOMS/ SIGNS/DISEASE CATEGORIES	CHARACTERISTIC OF THESE POISONINGS	MAY OCCUR IN THESE POISONINGS
	Upper respiratory tract irritation, rhinitis, scratchy throat, cough	Naphthalene Paraquat Chloropicrin Acrolein Dichloropropene Ethylene dibromide Sulfur dioxide Sulfuryl fluoride Acrylonitrile Formaldehyde Cadmium dusts Pyrethroids Strobilurin fungicides	Dry formulation of copper, tin, zinc compounds Dusts of thiocarbamate and other organic pesticides Chlorophenoxy compounds Aliphatic acids Rotenone
	Sneezing	Sabadilla	
	Runny nose	Pyrethrins/ pyrethroids Inorganic arsenicals Organophosphates N-methyl carbamates	Dry formulation of copper, tin, zinc compounds Dusts of thiocarbamate and other organic pesticides Chlorophenoxy compounds Aliphatic acids Rotenone
	Pulmonary edema (many chemicals come packaged in a hydrocarbon vehicle, well known to cause pulmonary edema)	Methyl bromide Phosphine Phosphorus Phosphine Ethylene oxide Ethylene dibromide Acrolein Pyrethroids Sulfur dioxide Cationic detergents Creosote Methylisothiocyanate Cadmium	Organophosphates N-methyl carbamates Paraquat Phosphides

## Respiratory System

<b>SYSTEM: Respiratory, cont.</b>	Pulmonary consolidation	Paraquat Cadmium dusts Methyl bromide	Diquat
	Dyspnea	Organophosphates N-methyl carbamates Nicotine Paraquat Cadmium dusts Cyanamide Sulfuryl fluoride Pentachlorophenol Methyl bromide Sulfur dioxide Chloropicrin Neonicotinoids	Nitrophenols Cyanide Creosote Pyrethrins Pyrethroids

<b>SYSTEM: Gastrointestinal Tract and Liver</b>	<b>SYMPTOMS/ SIGNS/DISEASE CATEGORIES</b>	<b>CHARACTERISTIC OF THESE POISONINGS</b>	<b>MAY OCCUR IN THESE POISONINGS</b>
	Diarrhea (non-bloody)	Organophosphates N-methyl carbamates Pyrethroids Borates Sulfur Nicotine B. thuringiensis Thiram Cadmium Avermectins	Cationic detergents Cresol Hexachlorophene Chlorophenoxy
	Diarrhea (bloody)	Fluoride Paraquat Diquat Thallium Coumarins Indandiones Endothall Arsenicals	Phosphorus Phosphides Cycloheximide
	Stomatitis	Inorganic arsenicals Paraquat Diquat Copper compounds	Thallium
	Salivation	Organophosphates N-methyl carbamates Pyrethroids Nicotine Aminopyridine Sodium fluoride Cyanide Cadmium compounds	

## Gastrointestinal Tract and Liver

Gastrointestinal Tract and Liver

Liver

Kidney

<b>SYSTEM: GI Tract and Liver, cont.</b>	Abdominal pain	Organophosphates N-methyl carbamates Paraquat Diquat Nicotine Metaldehyde Fluoride Borate Phosphorous Phosphides Inorganic arsenicals Cadmium compounds Copper compounds Thallium Organotin compounds Neonicotinoids	Chlorophenoxy compounds Aliphatic acids Sodium chlorate Creosote Endothall Aminopyridine Coumarins Indandiones Fumigants (ingested) Cycloheximide
	Ileus	Thallium Diquat	Pyriminil
	Constipation	Pyriminil	

<b>SYSTEM: Liver</b>	<b>SYMPTOMS/ SIGNS/DISEASE CATEGORIES</b>	<b>CHARACTERISTIC OF THESE POISONINGS</b>	<b>MAY OCCUR IN THESE POISONINGS</b>
	Enlargement	Copper compounds Sodium chlorate Phosphine Carbon tetrachloride Chloroform	Inorganic arsenicals Hexachlorobenzene
	Jaundice <i>(see section on Skin)</i>		

<b>SYSTEM: Kidney</b>	<b>SYMPTOMS/ SIGNS/DISEASE CATEGORIES</b>	<b>CHARACTERISTIC OF THESE POISONINGS</b>	<b>MAY OCCUR IN THESE POISONINGS</b>
	Proteinuria/hematuria and acute renal failure	Inorganic arsenicals Copper compounds Sodium fluoride Naphthalene Borate Nitrophenols Pentachlorophenol Sodium chlorate Sulfuryl fluoride Paraquat Diquat Arsine Ethylene dibromide	Cadmium compounds Phosphorus Phosphides Phosphine Chlorophenoxy compounds Creosote Organotin compounds

<b>SYSTEM: Kidney</b>	Rhabdomyolysis	Neonicotinoids Avermectins	
	Dysuria, hematuria, pyuria	Chlordimeform	
	Polyuria	Cholecalciferol	Fluoride
	Hemoglobinuria	Naphthalene Sodium chlorate Arsine	
	Wine-red urine (porphyrinuria)	Hexachlorobenzene	
	Smoky urine	Creosote Endothall	
	Glycosuria		Organotin compounds
	Ketonuria		Borate

<b>SYSTEM: Blood</b>	<b>SYMPTOMS/ SIGNS/DISEASE CATEGORIES</b>	<b>CHARACTERISTIC OF THESE POISONINGS</b>	<b>MAY OCCUR IN THESE POISONINGS</b>
	Hemolysis	Naphthalene Sodium chlorate Arsine	Copper compounds Cresol
	Methemoglobinemia	Sodium chlorate Creosote Propanil Metobromuron	Chlordimeform Cyanide Cresol Copper Arsine Diflubenzuron Nitrophenol Metolachlor
	Hypoprothrombinemia	Coumarins Indandiones	Phosphorus Phosphides Carbon tetrachloride
	Hyperkalemia	Sodium chlorate Naphthalene Arsine	Sodium fluoride
	Hypocalcemia	Fluoride	Thallium Phosphorus Phosphides
	Hypercalcemia	Cholecalciferol	
	Carboxyhemoglobinemia		Organotin compounds
	Anemia	Naphthalene Sodium chlorate Arsine Inorganic arsenicals	
	Leukopenia, Thrombocytopenia	Inorganic arsenicals	

## Kidney

## Blood

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**Blood**

<b>SYSTEM: Blood, cont.</b>	Elevated LDH GOT, GPT, alkaline phosphatase, ALT, AST enzymes	Carbon tetrachloride Chloroform Phosphine	Inorganic arsenicals Phosphorus Phosphides Sodium chlorate Nitrophenols Pentachlorophenol Thallium Organochlorines Chlorophenoxy compounds
	Depressed RBC acetylcholinesterase and plasma pseudocholinesterase	Organophosphates	N-methyl carbamates

**Reproductive  
System**

<b>SYSTEM: Reproductive</b>	<b>SYMPTOMS/ SIGNS/DISEASE CATEGORIES</b>	<b>CHARACTERISTIC OF THESE POISONINGS</b>	<b>MAY OCCUR IN THESE POISONINGS</b>
	Low sperm count	Dibromochloropropane	Kepone