

DESCRIPTION OF SYMPTOMS OF POISONING

| | |
|--------------------------------|------------------------|
| Acetaldehyde | Methyl Chloroformate |
| Acetic Acid | Nitric Acid |
| Acetic Anhydride | Nitric Oxide |
| Acrolein | Nitrogen Dioxide |
| Benzyl Chloride | Nitrogen Trifluoride |
| Boron Trifluoride | Osmic Acid |
| Bromine | Oxalic Acid |
| Butyraldehyde | Ozone |
| Carbon Disulfide | Peracetic Acid |
| Chlorine | Perchloric Acid |
| Chlorine Dioxide | Perchloryl Fluoride |
| Chloroacetaldehyde | Phenol |
| Chloroacetic Acid | Phenylenediamine (p-) |
| Cresote | Phosgene |
| Cresols | Phosphoric Acid |
| Crotonaldehyde | Potassium Chlorite |
| Dichloro-5,5-Dimethylhydantoin | Propionaldehyde |
| Dimethyl Sulfate | Quinone |
| Ethyl Chloroformate | Resorcinol |
| Formaldehyde | Silane |
| Formic Acid | Sodium Chlorite |
| Hydriodic Acid | Sulfur Dioxide |
| Hydrochloric Acid | Sulfur Trioxide |
| Hydrogen Bromide | Sulfuric Acid |
| Hydrogen Chloride | Sulfurous Acid |
| Hydrogen Peroxide | Tellurium Hexafluoride |
| Iodine | Tributyl Phosphate |
| Isobutyraldehyde | Trichloroacetic Acid |
| Maleic Anhydride | |

The above caustic (corrosive) substances all give off irritating vapors or fumes as soon as they come into contact with mucous membranes or moist skin. The more soluble in water they are, the quicker the symptoms develop. Chlorites give off CHLORINE DIOXIDE as soon as they come into contact with dilute acid. The concentration and composition of these products will determine the seriousness of injury.

I. INHALATION

A. Signs and symptoms of acute poisoning

1. Irritation of mucous membranes (nose, mouth, eyes, throat)
2. Watering of eyes, nasal discharge, sneezing, coughing (head cold-like)

3. Oppressive feeling in the chest or chest pain
4. Difficulty in breathing, wheezing
5. Rapid breathing
6. Fits of coughing
7. Headache
8. BLUISH face and lips
9. Salivation
10. Giddiness
11. Nausea
12. Muscular weakness
13. Ulceration of mucous membranes (nose)
14. Fluid in the lungs (pulmonary edema)
15. Secondary chemical pneumonia
16. Death

B. First aid: see *yellow* pages section 1, or see *yellow* pages, section 2 (OXALIC ACID only)

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Irritation and a burning sensation of lips, mouth, and throat
2. Pain in swallowing
3. Abundant salivation or drooling
4. Ulceration of the mucous membranes of the mouth and color change of the tongue (GRAY with HYDROCHLORIC ACID, YELLOW with NITRIC ACID, WHITE to BLACK with SULFURIC ACID, WHITE with HYDROGEN PEROXIDE, OXALIC ACID, and PHENOL)
5. Intense thirst
6. Swelling in the throat

-
- 7 Burning sensation in the chest (esophagus), back of throat, and stomach
 8. Painful abdominal cramps
 - 9 Nausea and vomiting, occasionally of coffee-grounds-like material (digestive bleeding)
 10. Difficulty in breathing
 11. Risk of perforation of the stomach causing a hard, rigid abdomen
 12. State of shock
 - weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet
 13. Convulsions
 14. Coma
 - 15 Death

B. First aid: see green pages, section 1, or green pages, section 2, per Chemical Index

III. SKIN CONTACT

PHENOL, which penetrates healthy skin, may cause generalized poisoning, resulting in death.

Vapors are generally less irritating to the skin than solutions, but the concentration and the length of contact determine the gravity of the symptoms.

In an accident where volatile products come in contact with the skin, poisoning by inhalation will frequently also occur.

A. Immediate signs and symptoms

1. Smarting or tingling
2. Burning sensation
3. Redness and swelling
4. Burns that may be very painful and become WHITE (in the case of

HYDROCHLORIC ACID, HYDROGEN PEROXIDE, and PHENOL)
or YELLOW (in the case of NITRIC ACID).

5. Painful blisters
 6. Profound damage to tissues (painless in the case of PHENOL)
 7. Shock can occur as a result of pain
 - weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet
 8. Coma
 9. Death
 10. Lingering death (PHENOL only)
- B. First aid:** see *pink* pages, section 1, or *pink* pages, section 3, per Chemical Index

IV. SPLASHING OF LIQUID IN OR CONTACT OF VAPOR WITH EYES

In an accident caused by volatile products, poisoning by inhalation will frequently also occur.

A. Immediate symptoms

1. Stinging or burning sensation
2. Watering of eyes
3. Redness and swelling of eyelids
4. Intense pain in eyelids and eyes, with ulceration of the tissues
5. Yellow eyes (NITRIC ACID only)
6. Opaqueness of the cornea causing blurred vision
7. Loss of sight

B. First aid: see *blue* pages, section 1

Chlorine Trifluoride
Fluorine
Fluosilicic Acid
Hydrofluoric Acid
Oxygen Difluoride

Potassium Fluoride
Potassium Fluosilicate
Sodium Fluoride
Sodium Fluosilicate

HYDROFLUORIC ACID is a very strong acid with a highly caustic and corrosive effect on organic tissue. The resulting burns often do not become painful until several hours later. Fluosilicates are less irritating but are toxic to liver and kidneys.

I. INHALATION

A. Signs and symptoms of acute poisoning

1. Irritation of mucous membranes (nose, eyes, mouth, throat)
2. Watering of eyes
3. Salivation
4. Fits of coughing
5. Ulceration of mucous membranes (nose and throat)
6. Pain in throat
7. Chest heaviness or pain
8. Difficulty in breathing
9. Bronchitis
10. Headache
11. Fatigue
12. Giddiness
13. Nausea
14. Stomach pains
15. Pale or BLUISH face
16. State of shock

- weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet
17. Fluid in the lungs (acute pulmonary edema)
 18. Coma
 19. Death
- B. First aid:** see *yellow* pages, section 1, or see *yellow* pages, section 7 (FLUOSILICATES only)

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Irritation and painful burning sensation of lips, mouth, and throat
2. Ulceration of mucous membranes
3. Pain in swallowing
4. Swelling in the throat
5. Intense thirst
6. Violent burning sensation in the chest (esophagus) and stomach
7. Painful stomach cramps with distension of stomach
8. Difficulty in breathing
9. Muscular fatigue and general weakness
10. Coughing
11. Fluid in the lungs (acute pulmonary edema)
12. Perforation of stomach causing a hard, rigid abdomen
13. Nausea and vomiting, occasionally of coffee-grounds-like material (digestive hemorrhage)
14. Pale or BLUISH face
15. State of shock

- weak and rapid pulse
- cold sweat—pale complexion
- lightheadedness
- cold hands and feet

16. Convulsions

17. Coma

18. Death

B. *First aid: see green pages, section 1*

III. SKIN CONTACT

A. Immediate signs and symptoms

1. Burning sensation and redness and swelling
2. Irreparable damage to skin, which gradually turns white and becomes very painful
3. Blisters
4. Profound damage deep in the tissues
5. Shock may occur as a result of pain
 - weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet

B. *First aid: see pink pages, section 3*

IV. SPLASHING OF LIQUID IN OR CONTACT OF VAPOR WITH EYES

A. Immediate signs and symptoms

1. Intense stinging and burning sensation
2. Watering of eyes

3. Redness and swelling of eyelids
4. Burning sensation in eyelids and eyes, with ulceration of the tissues
5. Irreparable damage to cornea with blurred vision
6. Loss of vision

B. First aid: see blue pages, section 1

| | |
|----------------------------------|------------------------|
| Alkali Dichromates | Perborates |
| Alkali Meta-Borates | Phthalic Anhydride |
| Aluminum Chloride | Platinum and Compounds |
| Aluminum Trichloride | Potassium Chromate |
| Boric Acid | Potassium Dichromate |
| Cadmium (dust and fumes) (metal) | Sodium Borate |
| Calcium Dichromate | Sodium Chromate |
| Calcium Hypochlorite | Sodium Dichromate |
| Caprolactam | Sodium Hypochlorite |
| Chlorinated Lime | Titanium Chlorides |
| Chromic Acid | Trimellitic Anhydride |
| Chromium Chloride | Uranium and Compounds |
| Copper Chloride | Vanadium and Compounds |
| Copper Sulfate | Zinc Chloride |
| Iron Chloride | |

In water, these substances are all irritating to mucous membranes of the digestive system and eyes, in addition to the specific toxicity of their cations.

ALUMINUM TRICHLORIDE and TITANIUM TETRACHLORIDE hydrolyze rapidly and in the presence of water, produce HYDROGEN CHLORIDE (see white pages, section 1).

I. INHALATION OF DUST

A. Signs and symptoms of very acute poisoning

1. Irritation of nose and eyes
2. Fits of coughing, sometimes violent
3. Difficulty in breathing
4. **BLUISH** face and lips
5. Risk of fluid in the lungs (pulmonary edema)

B. Signs and symptoms of acute poisoning

1. Irritation of nose and eyes
2. Tingling and burning sensation in lungs
3. Sneezing

C. First aid: see yellow pages, section 7

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Irritation of mouth and throat
2. Salivation
3. Burning sensation in stomach
4. Stomach cramps
5. Nausea and vomiting, occasionally of coffee-grounds-like material (digestive hemorrhage)
6. General weakness, dizziness
7. Diarrhea, possibly blood-stained
8. State of shock
 - weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet
9. Possible convulsions
10. Risk of paralysis (MAGNESIUM CHLORIDE only)
11. Coma
12. Death

B. First aid: see green pages, section 2, or green pages, section 1, per Chemical Index

III. CONTACT WITH MOIST SKIN

A. Immediate signs and symptoms

1. Itching
2. Irritation and burning sensation

3. Redness and swelling
4. Ulceration and possibly profound necrosis (destruction of tissue)

B. First aid: see pink pages, section 2

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Stinging and burning sensation
2. Watering of eyes
3. Redness and swelling of eyelids
4. Risk of serious injury

B. First aid: see blue pages, section 6

Ammonium Sulfide*
Hydrogen Selenide
Hydrogen Sulfide

Methyl Mercaptan
Phosphorus Pentasulfide
Selenium Hexafluoride

These are colorless gases with a strong smell of garlic or rotten eggs, highly toxic and irritating to mucous membranes of the respiratory system and eyes. The nose is very sensitive and can smell small amounts. However, the presence of a large quantity of the gas results in inability to smell it.

* AMMONIUM SULFIDE and its solutions decompose readily into Hydrogen Sulfide.

I. INHALATION

A. Signs and symptoms of very acute poisoning

1. Sudden loss of consciousness
2. Breathing stops abruptly
3. Death follows quickly

B. Signs and symptoms of acute poisoning

1. Irritation of nose, throat, and eyes
2. Sneezing
3. Headache
4. Excitability
5. Dizziness, staggering
6. Nausea and vomiting
7. Breathing difficulties
8. Pale complexion
9. Dry cough
10. Cold sweat
11. Diarrhea
12. Muscular weakness

13. Drowsiness
14. Risk of fluid in the lungs (pulmonary edema)
15. Death

B. *First aid:* see yellow pages, section 1

II. INGESTION

No risk, except for AMMONIUM SULFIDE

First aid: see green pages, section 3

III. SKIN CONTACT

The vapors cause no adverse symptoms on the skin, even in toxic concentrations. The solutions may be irritating.

A. Immediate signs and symptoms

1. Slight irritation
2. Painful inflammation
3. Possible dark discoloration

B. *First aid:* see pink pages, section 1

IV. CONTACT OF VAPOR WITH EYES

A. Immediate signs and symptoms

1. Irritation
2. Watery eyes
3. Redness and swelling of eyelids
4. Risk of serious injury

B. *First aid:* see blue pages, section 1

| | |
|---------------------|------------------|
| Calcium Carbide* | Potassium Oxide |
| Calcium Oxide | Sodium |
| Cement | Sodium Hydroxide |
| Lime | Sodium Oxide |
| Potassium | Sodium Peroxide |
| Potassium Hydroxide | |

These substances are particularly caustic (corrosive) in contact with mucous membranes and moist skin. They all give off heat when dissolved in water. This increases their corrosiveness since they are capable of dissolving living tissue.

*When CALCIUM CARBIDE comes into contact with moist skin, it decomposes into CALCIUM OXIDE, HYDROXIDE, and ACETYLENE, while PHOSPHINE and ARSINE are formed from impurities (see white pages, section 21)

I. INHALATION OF DUST

A. Signs and symptoms of very acute poisoning

1. Irritation of nose, eyes, and throat
2. Burning sensation in nose and throat
3. Difficulty in breathing
4. Fits of coughing
5. Risk of fluid in the lungs (acute pulmonary edema)

B. Signs and symptoms of acute poisoning

1. Irritation of nose and eyes
2. Sneezing
3. Tingling sensation in nose and throat
4. Cough

C. First aid: see yellow pages, section 7

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Immediate, intense burning sensation in mouth, throat, and stomach
2. Immediate effect on cheeks and mouth membranes, which become white
3. Intense pain in swallowing
4. Swelling of the throat
5. Extreme salivation and drooling, which increases the pain
6. Vomiting; vomit is coffee-grounds-like and contains pieces of mucous membrane of the stomach (digestive hemorrhage)
7. Stomach cramps
8. Rapid breathing
9. State of shock
 - weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet
10. Diarrhea, possibly blood-stained
11. Risk of perforation of stomach causing a hard, rigid abdomen
12. Loss of consciousness
13. Death

B. First aid: see green pages, section 3, or green pages, section 2, per Chemical Index

III. SKIN CONTACT

4. Profound, irreparable damage to tissues
5. State of shock
 - weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet

B. First aid: see *pink* pages, section 4

IV. SPLASHING IN EYES

A. Immediate or delayed signs and symptoms

1. Highly painful, instantaneous irritation of eyes and eyelids
2. Intense watering of eyes
3. Victim keeps eyelids tightly closed
4. Burns and irreparable damage of mucous membranes
5. Ulceration of eyes
6. Perforation of eyes and eyelids
7. Loss of eyes or eyesight

NOTE: If only one eye is splashed and first aid is not given immediately, the other eye may be lost as well, even if the substance has not come into contact with it!

B. First aid: see *blue* pages, section 2

| | |
|---|---|
| Acetylene* | Ethyl Fluoride |
| Alkanes (gasses, C ₁ to C ₄) | Ethylene |
| Butadiene | Fluoromethane |
| Butane | Freon 11, 12, 13, 14, 21, 22, 115, 142b, 143, 151a, 152a |
| Carbon Dioxide | Hexafluoroethane |
| Carbon Dioxide Snow | Liquefied Petroleum Gas |
| Carbon Monoxide | Methane |
| Chlorodifluoroethane | Methyl Chloride |
| Chlorodifluoromethane | Methylene Fluoride |
| Chlorofluoroethane | Nitrogen |
| Chlorofluoromethane | Propane |
| Chloromethane | Propylene |
| Chlorotrifluoroethylene | Tetrafluoroethylene |
| Chlorotrifluoromethane | Tetrafluoromethane |
| Dichlorodifluoromethane | Trichlorofluoromethane |
| Dichlorofluoromethane | Trifluoroethane |
| Diffuoroethanes | Trifluoromethane |
| Diffuoroethylene | Vinyl Fluoride |
| Ethane | Vinylidene Fluoride |
| Ethyl Ether | |

Most of these substances are gaseous or evaporate readily at room temperature, and are practically nonirritating and, with the exception of CARBON MONOXIDE, and METHYL CHLORIDE, nontoxic as such. However, in high concentrations they all cause asphyxia by displacing oxygen. METHYL CHLORIDE causes lesions in the cornea due to inflammation.

*In the case of technical grade ACETYLENE, highly toxic impurities such as ARSINE and PHOSPHINE (see white pages, section 21) should be taken into account

I. INHALATION

A. Signs and symptoms following severe exposure

ASPHYXIA

1. Need for fresh air or "air hunger"
2. Rapid, occasionally irregular, breathing
3. Headache
4. Fatigue

5. Mental confusion
6. Nausea and vomiting
7. Giddiness and poor judgement
8. Exhaustion
9. Loss of consciousness
10. Convulsions
11. Death

B. First aid: see yellow pages, section 3

II. INGESTION

Practically no risk for the gases. For the liquids:

A. Signs and symptoms of severe poisoning

1. Breath has ethereal sweetish smell
2. Mental confusion
3. Drowsiness
4. Headache
5. Loss of consciousness
6. Death

B. First aid: see green pages, section 4

III. SKIN CONTACT

Splashes of the liquid substances or sprays of the gases that have a low boiling point may "freeze" the skin. Inhalation of the vapors is likely.

A. Immediate signs and symptoms

1. Feeling of intense cold
2. Insensitivity to pain

3. Skin looks white and feels hard and cold, rapidly becoming painful (freezing)

B. First aid: see *pink* pages, section 5

IV. SPLASHING OF LIQUID IN EYES

The vapors have no serious irritating effect on the eyes.

When liquids that have a low boiling point are splashed in the eyes, they may cause severe "freezing."

A. Immediate or delayed signs and symptoms

1. Stinging pain
2. Watering of eyes
3. Inflammation of eye lids
4. Cloudiness or opaqueness of eyes

B. First aid: see *blue* pages, section 4

| | |
|--------------|------------------|
| Benzene | Nonane |
| Cumene | Octane |
| Cyclohexane | Pentane |
| Decane | Petroleum Ethers |
| Gasoline | Stoddard Solvent |
| Heptane | Toluene |
| Hexane | Turpentine |
| Naptha | Xylene |
| Nitromethane | |

The vapors of these substances are occasionally irritating to mucous membranes of the respiratory system and eyes and, in high concentrations, they are narcotic.

I. INHALATION

A. Signs and symptoms of acute poisoning

a. by vapors

1. Rapid breathing
2. Excitability, with drunken behavior and mental confusion
3. Staggering
4. Headache
5. Fatigue
6. Nausea with vomiting
7. Dizziness
8. Drowsiness
9. Narcosis (stupor and unresponsiveness)
10. Loss of consciousness
11. Convulsions
12. Coma and death

b. by mist or fine droplets

1. Coughing
2. Difficulty in breathing
3. **BLUISH** face and lips
4. Nausea and vomiting
5. Fatigue
6. Fever and cough indicative of chemical bronchitis or pneumonia
7. Fluid in the lungs (acute pulmonary edema)

B. First aid: see *yellow* pages, section 3

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Slight gastro-intestinal irritation
2. Dizziness
3. Fatigue
4. Loss of consciousness
5. Coma and death

If the victim recovers, there is risk of chemical pneumonia as evidenced by:

6. Coughing
7. Fever

B. First aid: see *green* pages, section 4

III. SKIN CONTACT

These gaseous substances have no effect on the skin. In liquid form, they remove oils from the skin, which eventually leads to the following:

A. Delayed signs and symptoms

1. Dryness
2. Cracking and irritation of the skin

B. First aid: see *pink* pages, section 6

**IV. SPLASHING OF LIQUID IN OR CONTACT OF
VAPOR WITH EYES**

The vapors of these substances are only slightly irritating to the eyes. Liquids are strongly irritating to the eyes and to mucous membranes.

A. Immediate signs and symptoms

1. Stinging sensation
2. Watering of eyes
3. Inflammation of the eyelids

B. First aid: see *blue* pages, section 5

| | |
|----------------------------------|-------------------------|
| Acetone | Glycerin |
| Aliphatic Alcohols—Amyl | Heptanol |
| Aliphatic Alcohols—Butyl | Hexanol |
| Amyl Acetate | Isobutyl Acetate |
| Butanol | Isopropyl Acetate |
| Butyl Acetate | Isopropyl Alcohol |
| Decanol | Methyl Acetate |
| Diacetone Alcohol | Methyl Alcohol |
| Diethylene Glycol | Methyl n-Butyl Ketone |
| Diisobutylcarbinol | Methyl Ethyl Ketone |
| Dioxane | Methyl Isoamyl Ketone |
| Ethyl Acetate | Methyl Isobutyl Ketone |
| Ethyl Alcohol | Methyl Isopropyl Ketone |
| Ethylbenzene | Pentanol |
| Ethylene Chlorohydrin | Propyl Acetate |
| Ethylene Glycol | Propyl Alcohol |
| Ethylene Glycol Monomethyl Ether | Propylene Glycol |
| Ethylhexyl Acetate | Triethylene Glycol |
| Furfuryl Alcohol | Vinyl Acetate |

These liquids are more or less volatile and, in high concentrations, cause depression of the brain and nervous system and damage to the liver.

GLYCERIN is only slightly volatile and reputed to be nontoxic.

I. INHALATION

A. Signs and symptoms of acute poisoning

1. Slight irritation of nose and eyes
2. Head feels hot and face is flushed
3. Excitability and talkativeness
4. Drunken behavior
5. Staggering and lack of coordination
6. Headache
7. Mental confusion and visual disturbance
8. Tiredness

9. Nausea and vomiting
10. Paleness of complexion
11. Dizziness
12. Eyes are sensitive to and painful in direct light (METHYL ALCOHOL only)
13. Drowsiness
14. Stupor
15. Loss of consciousness
16. Coma and death

NOTE: METHYL ALCOHOL can seriously impair vision and may cause blindness.

B. First aid: see *yellow* pages, section 3

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Gastro-intestinal irritation
2. Followed by symptoms described in I. INHALATION

NOTE: METHYL ALCOHOL can seriously impair vision and may cause blindness. Glycol derivatives are toxic to the kidneys.

B. First aid: see *green* pages, section 12

III. SKIN CONTACT

A. Immediate signs and symptoms

- Highly volatile products (METHYL ALCOHOL and ACETONE) produce a feeling of cold.

- Alcohols, acetates, and ACETONE remove oils from the skin, which becomes dry and eventually develops cracks or dermatitis.
- Glycol derivatives have little effect on healthy skin.

NOTE: METHYL ALCOHOL, which can be absorbed by the skin, causes

- headache
- fatigue
- reduction of visual acuity

B. First aid: see *pink* pages, section 6

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Vapors are slightly uncomfortable; splashes are irritating
2. Irritation with painful burning or stinging sensation
3. Watering of eyes
4. Inflammation of the eyelids
5. Eyes are sensitive to and painful in the light

B. First aid: see *blue* pages, section 5

| | |
|---------------------------|---------------------------|
| Bromoform | Ethylene Dichloride |
| Butyltoluene | Freon 112, 113, 114, 115 |
| Carbon Tetrachloride | Halothane |
| Chlorobenzene | Hexachloroethane |
| Chlorobromomethane | Methylchloroform |
| Chloroethane | Methylene Chloride |
| Chloroform | Pentachloroethane |
| Chloropentafluoroethane | Tetrachlorodifluoroethane |
| Chloropropane | Tetrachloroethane |
| Chloropropene | Tetrachloroethylene |
| Dichlorobenzene | Trichloroethane |
| Dichloroethane | Trichloroethylene |
| Dichloroethylene | Trichlorotrifluoroethane |
| Dichloropropane | Vinyl Chloride |
| Dichlorotetrafluoroethane | Vinylidene Chloride |

The chlorinated and chlorofluorinated solvents are colorless, volatile gases or liquids that smell of chloroform. They are, in varying degrees, toxic to the nervous system, liver, and kidney. They remove oils from skin, which eventually becomes dry and cracked. METHYLENE CHLORIDE is converted to carbon monoxide in the body.

The fluorinated solvents have little irritating or toxic effect on the nervous system, but can cause irregular heart beat.

I. INHALATION

A. Signs and symptoms of acute poisoning

1. Irritation of eyes, nose, and throat
2. Overexcitement
3. Headache
4. Drunkenness (staggering, loss of equilibrium)
5. Irregular heart beat resulting in sudden death
6. Loss of consciousness
7. Narcosis (deep unconsciousness)
8. State of shock

- weak and rapid pulse
- cold sweat—pale complexion
- lightheadedness
- cold hands and feet

9. Coma

10. Death as a result of cardiac or respiratory failure

NOTE: There is risk of fluid in the lungs (acute pulmonary edema) if the victim recovers.

B. Signs and symptoms of relatively acute poisoning

1. Headache
2. Fatigue, weariness
3. Nausea, vomiting
4. Dizziness
5. Irregular heart beat resulting in sudden death
6. Stupor
7. Drowsiness
8. Disturbed vision
9. Coughing
10. Narcosis (deep unconsciousness)

C. First aid: see yellow pages, section 3

II. INGESTION

(Except for chlorinated solvents with low boiling points.)

A. Symptoms of acute poisoning

CHARACTERISTIC SYMPTOM: breath smells of chloroform

1. Irritation of lips and mouth

2. Gastro-intestinal irritation
3. Irregular heart beat resulting in sudden death
4. Nausea, vomiting
5. Diarrhea, possibly blood-stained
6. Drowsiness
7. Loss of consciousness
8. Narcosis (deep unconsciousness)
9. State of shock
 - weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet
10. Risk of fluid in the lungs (acute pulmonary edema)

B. First aid: see green pages, section 5

III. SKIN CONTACT

Chlorinated solvents absorbed through healthy skin may cause symptoms described under I. INHALATION, B.

A. Immediate and delayed signs and symptoms

1. Dry skin
2. Freezing of skin
3. Redness and swelling
4. Blisters that later become painful

B. First aid: see pink pages, section 6, or pink pages, section 5, per Chemical Index

IV. SPLASHING OF LIQUID IN OR CONTACT OF VAPOR WITH EYES

A. Immediate symptoms caused by vapors

1. Irritation of eyes
2. Watering of eyes
3. Occasionally inflammation of eyelids

B. Immediate signs and symptoms when liquid is splashed in eyes

1. Burning sensation
2. Watering of eyes
3. Inflammation of eyelids
4. Lesions in cornea due to inflammation (VINYL CHLORIDE)

C. *First aid:* see *blue* pages, section 5 or *blue* pages, section 4, per Chemical Index

Barium (soluble salts)
Barium Acetate
Barium Carbonate
Barium Chloride
Barium Fluoride

Barium Hydroxide
Barium Nitrate
Barium Oxide
Barium Sulfide

All the soluble barium compounds have a toxic effect on the nervous system and heart and may lead to death in the course of a few hours. Soluble barium compounds occur as crystals and have a disagreeable, styptic taste.

NOTE: Only **BARIUM SULFATE** is insoluble and nontoxic.

I. INHALATION

Soluble barium compounds in the form of dust may be absorbed by nasal mucous membranes and cause a moderate degree of poisoning.

A. Signs and symptoms of acute poisoning

1. Irritation of nose and eyes (**BARIUM FLUORIDE**, **BARIUM HYDROXIDE**, and **BARIUM OXIDE**)
2. Muscular twitching
3. Tendency to fatigue
4. Abdominal cramps
5. Cold sweat
6. Slow heart rate
7. Death from heart stopping

B. First aid: see yellow pages, section 2

II. INGESTION

A. Symptoms of acute poisoning

1. Disagreeable taste
2. Muscular twitching

3. Nausea and vomiting
 4. Stomach pains and diarrhea
 5. Anxiety
 6. Slow heart rate
 7. Convulsions
 8. BLUISH face and lips
 9. State of shock
 - weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet
 10. Paralysis of lower limbs, spreading to upper limbs
 11. Difficulty in breathing
 12. Death by respiratory failure or respiratory paralysis or heart stoppage
- B. First aid:** see *green pages*, section 6, or *green pages*, section 1
(**BARIUM FLUORIDE only**)

III. SKIN CONTACT

BARIUM FLUORIDE, BARIUM OXIDE, and soluble salts are irritating to the skin.

A. Symptoms and signs

1. Irritation of skin and mucous membranes
2. Prolonged contact of dusts with moist skin causes
 - ulcerations
 - necrosis (destruction of tissue) (**BARIUM FLUORIDE only**)

- B. *First aid:* see *pink* pages, section 2, or *pink* pages, section 3**
(BARIUM FLUORIDE only)

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Mechanical and chemical irritation
2. Watering of eyes
3. Inflammation of eyelids (BARIUM FLUORIDE, BARIUM OXIDE, and BARIUM HYDROXIDE)
4. Burning sensation

- B. *First aid:* see *blue* pages, section 6, or *blue* pages, section 1**
(BARIUM FLUORIDE only)

| | |
|---------------------|-------------------------|
| Aniline | Nitrobenzene |
| Anisidines (ortho) | Nitrochlorobenzene (p-) |
| Anisidines (para) | Nitrotoluene |
| Benzidine | Phenylhydrazine |
| Dimethylaniline | Phenylhydroxylamine |
| Dinitrobenzene | Phenylsulfthylamine |
| Dinitrotoluene | Tetranitromethane |
| Hydroquinone | Toluidine (o-) |
| Monomethylhydrazine | Toluidine |
| Naphthalene | Trinitrobenzene |
| Naphthylamines | Trinitrotoluene |
| Nitroanilines | Xylidines |

These substances are toxic to the blood and prevent hemoglobin from carrying oxygen.

I. INHALATION

A. Symptoms of acute poisoning

1. Face, lips, and hands are DEEP BLUE
2. Headache
3. Rapid and difficult breathing
4. Dizziness
5. Mental confusion
6. General weakness
7. Convulsions
8. Coma
9. Death

B. *First aid: see yellow pages, section 4*

II. INGESTION

A. Signs and symptoms of acute poisoning

See I. INHALATION

Irritation of mouth and stomach

2. Stomach cramps and diarrhea

B. First aid: see *green* pages, section 7

III. SKIN CONTACT

Those substances that are fat-soluble can be absorbed by healthy skin and cause the same symptoms as described under I. INHALATION.

A. Additional immediate signs and symptoms

1. Irritation
2. Small vesicles or blisters
3. Redness and swelling
4. Ulceration and necrosis (destruction of tissue)

B. First aid: see *pink* pages, section 6

IV. SPLASHING IN EYES

A. Immediate symptoms

1. Irritation
2. Redness and swelling of eyelids
3. Pain when looking into light
4. Severe damage to eyes

B. First aid: see *blue* pages, section 3

Ammonium Chlorate
Ammonium Perchlorate
Potassium Chlorate

Potassium Perchlorate
Sodium Chlorate
Sodium Perchlorate

These substances come in the form of white, highly reactive crystals.

The perchlorates, and the chlorates even more so, are toxic to the blood. They prevent hemoglobin from carrying oxygen. After 1 to 3 days, they also cause serious lesions in the liver and kidneys that may result in death.

I. INHALATION

There is little risk of poisoning because the serious risk of fire requires strict safety measures dealing with the formation of dust.

A. Signs and symptoms of acute poisoning

1. Irritation of nose and eyes
2. Sneezing
3. Small ulcerations in the nose

B. First aid: see yellow pages, section 2

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Stomach pains
2. Nausea and vomiting
3. Diarrhea
4. BLUISH face and hands
5. Rapid breathing
6. Dizziness
7. Mental confusion

8. General weakness
9. Coma
10. Death

B. First aid: see green pages, section 8

III. SKIN CONTACT

Clothes that have simply been dried must not be returned to the victim. It is essential that they be washed with plenty of water.

NOTE: Clothes that have been impregnated with chlorate or perchlorate solution may, once dry, burst spontaneously into flames; they may also burn as a result of simple friction or contact with a spark or hot cigarette ash.

A. Immediate signs and symptoms

1. Slight irritation
2. Inflammation
3. Ulcerations may follow later
4. Burns

B. First aid: see pink pages, section 2

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Mechanical irritation
2. Watering of eyes
3. Inflammation of eyelids
4. Burns

B. First aid: see blue pages, section 6

Calcium Chloride
Dithiocarbamates
Potassium Chloride

Sodium Bicarbonate
Sodium Chloride
Thiocarbamates

These soluble salts have a very low level of toxicity.

Their concentrated aqueous solutions, however, may be slightly caustic (corrosive) and affect mucous membranes of the digestive system and eyes.

I. INHALATION

Only when large amounts of fine dust are inhaled will the following symptoms occur:

A. Symptoms of acute poisoning

1. Slight irritation of nose
2. Sneezing

B. *First aid: see yellow pages, section 6*

II. INGESTION

A. Symptoms and signs of acute poisoning

1. Disagreeable taste
2. Nausea and vomiting
3. Gastro-intestinal irritation (CALCIUM CHLORIDE only)
4. Fever
5. Muscle twitching
6. Seizure
7. Rapid respirations
8. Slow heart beat
9. Death

B. *First aid: see green pages, section 8*

III. SKIN CONTACT

A. Immediate signs and symptoms

1. Irritation
2. Inflammation
3. Small ulcerations

B. *First aid:* see *pink* pages, section 2

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Mechanical irritation
2. Watery eyes
3. Inflammation of eye lids

B. *First aid:* see *blue* pages, section 6

| | |
|--------------------|---------------------------|
| Aluminum (dust) | Kaolin |
| Aluminum Hydrate | Polyvinyl Chloride |
| Aluminum Hydroxide | Silica |
| Aluminum Oxide | Talc |
| Asbestos | Titanium (dust and fumes) |
| Calcium Carbonate | Titanium Dioxide |
| Carbon | Tungsten Carbide |
| Carbon Black | Yttrium and Compounds |
| Fibrous Glass | |

These substances are solid, amorphous, and have few immediate toxic symptoms. POLYVINYL CHLORIDE decomposes under heat, giving off hydrochloric acid fumes (see HYDROCHLORIC ACID, white pages, section 1.)

ASBESTOS and SILICA have been recognized in the United States as having serious injurious effects on the lungs in both long and short ranges, particularly the former. Criteria documents discussing both from many aspects are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

OCCUPATIONAL EXPOSURE TO ASBESTOS—HSM—72—10267,
2nd printing, 1972.

OCCUPATIONAL EXPOSURE TO CRYSTALLINE SILICA—HEW,
Publication No. (NIOSH) 75-130, 1974.

OCCUPATIONAL RESPIRATORY DISEASES (edited by J.A. Merchant) DHHS (NIOSH), Publication No. 86-102, 1986.

I. INHALATION

A. Symptoms and signs of heavy inhalation

1. Sneezing
2. Slight irritation of nose
3. Cough

B. *First aid:* see yellow pages, section 6

II. INGESTION

No symptoms

A. *First aid: see green pages, section 10*

III. SKIN CONTACT

A. Immediate signs and symptoms

1. Itching and redness (FIBROUS GLASS)

B. *First aid: see pink pages, section 7*

IV. SPLASHING IN EYES

A. Immediate symptoms

1. Mechanical irritation and pain

2. Watering of eyes

3. Inflammation of eyelids

B. *First aid: see blue pages, section 7*

| | |
|-----------------------------|-------------------------|
| Diethylmercury | Methylmercury Borate |
| Dimethylmercury | Methylmercury Hydroxide |
| Ethylmercuric Chloride | Methylmercury Iodide |
| Ethylmercuric Hydroxide | Methylmercury Nitrate |
| Ethylmercury | Methylmercury Phosphate |
| Mercury (organic compounds) | Phenylmercuric Acetate |
| Mercury Fulminate | Phenylmercury |
| Methylmercury | Phenylmercury Oleate |

These substances are all toxic on inhalation, ingestion, or contact with skin. They cause lesions in many organs, and particularly in the nervous system.

They are toxic on acute or chronic exposure.

All cases of poisoning by these substances, even if they are not serious, must be reported to the physician, who alone is competent to definitively treat the victim.

I. INHALATION

A. Signs and symptoms of acute poisoning

1. Metallic taste
2. Salivation
3. Headache
4. Dizziness
5. Clumsiness, lack of coordination
6. General weakness
7. Tremor in arms and legs (occasionally)

B. First aid: see yellow pages, section 5

II. INGESTION

In addition to the symptoms mentioned under I. INHALATION

A. Signs and symptoms of acute poisoning

1. Irritation of mouth and throat
2. Stomach pains
3. Nausea and vomiting
4. Diarrhea

B. First aid: *see green pages, section 9*

III. SKIN CONTACT

All organic derivatives of mercury are absorbed by healthy skin and may cause chronic poisoning.

A. Immediate symptoms

1. Irritation
2. Itching
3. Redness
4. Blisters
5. Ulcerations (MERCURY FULMINATE only)

B. First aid: *see pink pages, section 2*

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Irritation
2. Watery eyes
3. Irritation of eyelids
4. Serious lesions may occur in eyes

B. First aid: *see blue pages, section 6*

| | |
|-----------------------|-------------------------|
| Mercuric Chloride | Mercury (soluble salts) |
| Mercuric Iodide (red) | Mercury Acetate |
| Mercurous Chloride | Mercury Nitrate |
| Mercurous Iodide | Mercury Oxycyanide |
| Mercury (metal) | |

Metallic mercury's vapors are sufficiently volatile to cause very severe poisoning. The soluble mercury salts are also all toxic to tissues and, in addition to their severe acute toxicity, cause chronic mercury poisoning on exposure over long periods. Chronic mercury poisoning has highly characteristic symptoms but is not discussed in this manual.

I. INHALATION

A. Signs and symptoms of very acute poisoning (mercury vapors)

1. Metallic taste
2. Rapid and difficult breathing
3. Coughing
4. Bronchitis followed by chemical pneumonia
5. Risk of fluid in the lungs (acute pulmonary edema) for up to 15 days

B. Signs and symptoms of acute poisoning after 2 days

1. Evil-smelling salivation
2. Inflammation of mouth
3. Profuse sweating
4. Headache
5. Nausea, vomiting
6. Stomach cramps
7. Diarrhea
8. Great weakness
9. Tremors

C. First aid: see yellow pages, section 5

II. INGESTION

A. Immediate signs and symptoms

1. Metallic taste
2. Intense thirst
3. Pain in swallowing
4. Stomach or abdominal pain
5. Nausea and vomiting, vomit may contain blood or greenish substance
6. Diarrhea, occasionally blood-stained or greenish
7. State of shock
 - weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet
8. Tremor in arms and legs

B. First aid: see *green* pages, section 2

III. SKIN CONTACT

The soluble mercury salts are irritating to the skin. They may also penetrate healthy skin.

Metallic mercury is not irritating but may be absorbed through healthy skin.

A. Immediate signs and symptoms

1. Irritation
2. Inflammation
3. Blisters

B. First aid: see *pink* pages, section 2

IV. SPLASHING IN EYES

Metallic mercury is not irritating. Insoluble mercury salts are mechanical irritants while soluble salts are chemical irritants to the mucous membranes

A. Immediate signs and symptoms

1. Irritation
2. Watering of eyes
3. Inflammation of eyelids
- 4 Swelling of eyelids
5. Occasionally serious lesions in eyes

B. *First aid:* see blue pages, section 6

| | |
|-------------------------------|-----------------------------------|
| Acrylamide | Ethyleneimine |
| Allyl Alcohol | Furfural |
| Allyl Chloride | Glutaraldehyde |
| Allyl Glycidyl Ether | Glycidol |
| Allyl Propyl Disulfide | Glycidyl Acrylate |
| Bis(Chloromethyl) Ether | Ketene |
| Butyl Glycidyl Ether (n-) | Methyl Acrylate |
| Chloro-1-Nitropropane (1-) | Methyl Bromide |
| Chloroacetophenone (2-) | Methyl Isocyanate |
| Chlorobenzylidene Malonitrile | Methyl Methacrylate Monomer |
| Chloropicrin | Methylenebis(Phenyl Isocyanate) |
| Cyclohexanol | Nickel (fumes and dust) |
| Cyclohexanone | Nickel Carbonyl |
| Diazomethane | Perchloromethyl Mercaptan |
| Diborane | Picric Acid |
| Dibutyl Phthalate | Propylene Glycol Monomethyl Ether |
| Diepoxybutane | Propylene Oxide |
| Diethylaminoethanol | Pyrethrins |
| Diglycidyl Ether | Styrene |
| Epichlorohydrin | Tetryl |
| Ethyl Acrylate | Toluene 2,4-di-Isocyanate |
| Ethylene Oxide | Toluene 2,6-di-Isocyanate |

These substances are all irritating to the respiratory organs, skin, and mucous membranes of the digestive system and eyes. Some of them have a toxic effect on the liver and kidneys. Some are narcotic in high concentration.

I. INHALATION

A. Signs and symptoms of very acute poisoning

1. Irritation of mucous membranes (nose, eyes, throat)
2. Watering of eyes and nose
3. Chest heaviness or pain
4. Difficulty in breathing
5. Coughing
6. BLUISH face and lips

7. Wheezing
8. Risk of fluid in the lungs (acute pulmonary edema)

B. Signs and symptoms of acute poisoning

1. Irritation of mucous membranes (nose, eyes)
2. Headache
3. Nausea, occasionally vomiting
4. BLUISH face and lips
5. Dizziness
6. Fatigue
7. Diarrhea

C. First aid: see yellow pages, section 4

II. INGESTION

Because of their pungent smell, there is little risk of ingestion of these substances.

A. Signs and symptoms of acute poisoning

1. Irritation of lips, mouth, and throat
2. Pain in swallowing
3. Stomach and abdominal pain
4. Nausea and vomiting
5. Diarrhea
6. State of shock
 - weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet

7. Convulsions may occur
 8. Risk of fluid in the lungs (acute pulmonary edema)
- B. First aid:** see *green* pages, section 2

III. CONTACT WITH MOIST SKIN

These substances all penetrate healthy skin and are highly irritating to moist skin.

A. Immediate signs and symptoms

1. Itching and irritation (except with ETHYLENE OXIDE and PROPYLENE OXIDE)
2. Inflammation
3. Blisters that may be very large, although painless at first
4. Burns and painful ulceration (NICKEL CARBONYL and ALLYL ALCOHOL only)

B. First aid: see *pink* pages, section 6

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Irritation
2. Watery eyes
3. Inflammation of eyelids
4. Chemical burns in corneas with pain and difficulty seeing
5. Possibility of serious lesions in eyes

B. First aid: see *blue* pages, section 5

| | |
|----------------|------------------|
| Dibutyllead | Tetraethyllead* |
| Diethyllead | Tetramethyllead* |
| Lead Oleate | Tributyllead* |
| Lead Phenate | Triethyllead* |
| Lead Phthalate | Trimethyllead* |
| Lead Stearate | |

These organic lead compounds can all be absorbed by healthy skin. In cases of severe exposure, they are toxic to the nervous system, liver, and kidneys.

They are highly caustic (corrosive), volatile liquids or gases.

1. INHALATION

The risk of severe poisoning depends on the volatility of the compounds and is greatest in those compounds with an asterisk (*).

A. Signs and symptoms of acute poisoning

1. Occasional irritation of nose
2. Trembling
3. Restlessness
4. Delirium
5. Convulsions

B. Signs and symptoms of mild poisoning

1. Restlessness
2. Trembling of hands
3. Headache
4. Pale complexion
5. Occasionally nausea and vomiting
6. Insomnia and nightmares

C. *First aid: see yellow pages, section 5*

II. INGESTION

A. Signs and symptoms of acute poisoning

See I. INHALATION

B. *First aid:* see *green* pages, section 9

III. SKIN CONTACT

A. Immediate signs and symptoms

1. Itching
2. Inflammation
3. Blisters

B. *First aid:* see *pink* pages, section 6

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Irritation
2. Watering of eyes
3. Inflammation of eyelids

B. *First aid:* see *blue* pages, section 6

| | |
|--------------------|----------------|
| Aliphatic Amines | Ethanolamine |
| Ammonia | Ethylamine |
| Ammonium Hydroxide | Isopropylamine |
| Butylamine | Methylamine |
| Dibutylamine | Propylamine |
| Diethylamine | Triethylamine |
| Dimethylamine | Trimethylamine |
| Dipropylamine | |

Aqueous solutions of these substances are highly irritating to mucous membranes of the respiratory and digestive systems, eyes, and to healthy skin.

I. INHALATION

A. Signs and symptoms of very acute poisoning

1. Irritation of nose, throat, and eyes
2. Burning sensation
3. Difficulty in breathing
4. Fits of coughing
5. Chemical pneumonia or bronchitis
6. Fluid in the lungs (acute pulmonary edema)
7. Sudden death (AMMONIA only)

B. Signs and symptoms of acute poisoning

1. Irritation of nose and eyes
2. Sneezing
3. Tingling sensation in respiratory tract
4. Coughing
5. Risk of chemical bronchitis

AFTER AN APPARENT ARREST IN THE SYMPTOMS

6. Risk of fluid in the lungs (acute pulmonary edema)

C. First aid: see yellow pages, section I

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Immediate burning sensation in mouth, throat, and stomach. The mucous membranes of the mouth are attacked
2. Pain on swallowing
3. Swelling of the throat
4. Profuse salivation
5. Nausea and vomiting of coffee-grounds-like material (bleeding in stomach)
6. Stomach cramps
7. Rapid breathing
8. State of shock
 - weak and rapid pulse
 - cold sweat—pale complexion
 - lightheadedness
 - cold hands and feet
9. Diarrhea, occasionally blood-stained
10. Risk of stomach perforation with hard, rigid abdomen

B. First aid: see *green* pages, section 3

III. SKIN CONTACT

A. Immediate signs and symptoms

1. Itching and tingling sensation
2. Painful burning
3. Painful ulcerations
4. Skin feels slippery or soapy
5. State of shock
 - weak and rapid pulse

- cold sweat—pale complexion
- lightheadedness
- cold hands and feet

B. First aid: see *pink* pages, section 4

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Immediate, highly painful irritation of eyes and eyelids
2. Intense watering of eyes
3. Victim keeps eyelids tightly closed
4. Burns and irreparable damage to mucous membranes of eyes
5. Serious injury in eyes

B. First aid: see *blue* pages, section 2

Ammonium Carbonate
Calcium Hydroxide
Lithium Carbonate
Lithium Hydride
Milk of Lime

Potassium Carbonate
Sodium Carbonate
Sodium Silicate
Trisodium Phosphate

In contact with water, the above crystalline substances give alkaline solutions that are highly irritating to mucous membranes of the respiratory and digestive systems and eyes.

LITHIUM CARBONATE is toxic to the kidneys.

I. INHALATION

A. Signs and symptoms of very acute poisoning

1. Irritation of nose, eyes, and throat
2. Sneezing
3. Difficulty in breathing
4. Coughing, occasional fits of coughing
5. Chemical bronchitis

B. Signs and symptoms of acute poisoning

1. Irritation of nose and eyes
2. Tingling sensation in respiratory tract
3. Sneezing
4. Coughing

C. *First aid:* see yellow pages, section 2

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Burning sensation in mouth, chest, and stomach
2. Irritation of mouth

3. Pain in swallowing
4. Stomach cramps
5. Nausea and vomiting (LITHIUM CARBONATE only)
6. Occasional trembling of arms and legs (LITHIUM CARBONATE only)
7. Occasional mental confusion (LITHIUM CARBONATE only)

B. *First aid:* see green pages, section 3

II. CONTACT WITH MOIST SKIN

A. Immediate signs and symptoms

1. Itching and tingling sensation
2. Burning sensation
3. Redness and swelling

B. *First aid:* see pink pages, section 9

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Mechanical irritation, followed by chemical irritation
2. Pain
3. Watering of eyes
4. Risk of serious injury to eyes if victim keeps eyelids tightly closed

B. *First aid:* see blue pages, section 3, or blue pages, section 2, per Chemical Index

Antimony and Compounds
Arsenic
Arsenic Trichloride
Arsenicals
Arsine
Phosphine

Phosphorus
Phosphorus Chlorides
Phosphorus Pentachloride
Phosphorus Trichloride
Stibine

ARSINE, STIBINE, and PHOSPHINE are highly toxic gases.

The liquid chlorides give off highly irritating and toxic fumes.

All the above are toxic to the liver, and kidneys and may cause damage to these organs. They are also toxic to the red blood cells.

I. INHALATION

A. Signs and symptoms of very acute poisoning

1. Passing attack of headache
2. Sudden loss of consciousness
3. Almost instantaneous death

B. Signs and symptoms of acute poisoning

1. Headache
2. Dizziness
3. Nausea, occasionally vomiting
4. Fatigue
5. Difficulty in breathing
6. Pale or BLUISH face
7. Dry cough
8. Cold sweat
9. Abdominal pain with diarrhea
10. Trembling of arms and legs
11. Convulsions

12. Loss of consciousness
13. Risk of fluid in the lungs (pulmonary edema)
14. Death

C. First aid: see *yellow pages*, section 1

II. INGESTION

A. Signs and symptoms of acute poisoning

In addition to the severe symptoms given under I. INHALATION, B

1. Irritation of mouth and throat
2. Burning pains in stomach
3. Nausea and vomiting
4. Foul-smelling diarrhea which causes burning pain when passed

B. First aid: see *green pages*, section 1, or *green pages*, section 2, per Chemical Index

III. SKIN CONTACT

These compounds all penetrate or react with healthy skin and cause general poisoning even when there is limited contact with the skin. The chlorides are highly irritating to tissues.

In addition to the general symptoms described under I. INHALATION

A. Immediate signs and symptoms

1. Painful irritation
2. Inflammation
3. Blisters
4. Rapid ulceration of the skin

- B. *First aid: see pink pages, section 1, or see pink pages, section 2*
(ARSENIC soluble salts only)

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Immediate irritation of eyes
2. Watering of eyes
3. Inflammation and burning sensation
4. Risk of serious injury to eyes

- B. *First aid: see blue pages, section 1, or see blue pages, section 6*
(ARSENIC soluble salts only)

| | |
|------------------|------------------|
| Dibutyltin | Tetraisoalkyltin |
| Diethyltin | Tetrapentyltin |
| Dihexyltin | Tetrapropyltin |
| Diiododiethyltin | Tributyltin |
| Dimethyltin | Trimethyltin |
| Diocetyl tin | Triphenyltin |
| Tetrabutyltin | Tripropyltin |
| Tetraethyltin | |

The above substances are all toxic to the nervous system and cause long term permanent damage, in addition to damage to the liver and kidneys. Their toxicity increases with decreasing molecular weight.

I. INHALATION

A. Signs and symptoms of very acute poisoning

1. Irritation of nose and eyes
2. Sneezing
3. Headache
4. Nausea
5. General feeling of discomfort
6. Coughing

B. First aid: see yellow pages, section 5

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Irritation of mouth, throat and stomach
2. Headache
3. Nausea and Vomiting
4. Stomach pains

5. Dizziness
 6. Convulsions
 7. Loss of consciousness
 8. Coma
 9. Risk of permanent paralysis of the limbs
 10. Death
- B. First aid: see green pages, section 9**

III. SKIN CONTACT

These substances are irritating to the skin in varying degrees.

A. Immediate symptoms

1. Itching
2. Irritation
3. Redness and swelling
4. Blisters may occur, followed by ulceration of the skin

B. First aid: see pink pages, section 2

IV. SPLASHING IN EYES

Vapors of these substances are irritating to the eyes.

A. Immediate symptoms

1. Irritation and itching
2. Watering of eyes
3. Redness and swelling of eyelids

B. First aid: see blue pages, section 6

| | |
|------------------|---------------------------|
| Aldicarb | OMPA |
| Carbamates | Organophosphate Compounds |
| Chlorfithion | Paraoxon |
| DDVP | Parathion |
| Demeton | Phorate |
| Diazinon | Phosdrin |
| Dipterex | Phosphoric Ester |
| EPN | Ronnel |
| Isopestox | Sulfotepp |
| Leptophos | TEPP |
| Malathion | Trithion |
| Methyl Parathion | |

IMPORTANT NOTE: A splash of a single drop of PARATHION in the eye may result in serious effects, and even death.

The ORGANOPHOSPHORUS and CARBAMATE COMPOUNDS are volatile, extremely toxic compounds, usually with very rapid effects. They can be absorbed by skin or eye contact as well as by ingestion or inhalation. In some cases, signs and symptoms may be delayed up to 4 hours after exposure. ALWAYS send the victim to a medical facility for immediate follow-up.

They block the action of cholinesterase in the tissues which results in widespread nervous system disorders leading to serious muscular disturbances and increased secretions of saliva, sweat and phlegm in the lungs.

Atropine given intravenously by medical personnel is life saving.

I. INHALATION

A. Signs and symptoms of acute poisoning

1. Profuse sweating
2. Slow heart beat
3. Nausea and vomiting
4. Salivation and watering eyes
5. Stomach cramps
6. Muscle twitching
7. Diarrhea

8. Weakness
9. Headache and dizziness
10. Trouble breathing with wheezing
11. Very small pupils
12. Blurred vision
13. Anxiety and agitation
14. Bizarre behavior
15. Cough producing sputum
16. Hypersecretion in the lungs
17. Weakness of respiratory muscles
18. Fluid in the lungs (pulmonary edema)
19. Slow pulse leading eventually to stoppage of heart
20. Convulsions
21. High fever
22. Incontinence of bladder and bowels
23. Loss of consciousness
24. Death

B. First aid: see yellow pages, section 3

II. INGESTION

A. Signs and symptoms of acute poisoning

See symptoms described under I. INHALATION

B. First aid: see green pages, section 2

III. SKIN CONTACT

A. Immediate signs and symptoms

See symptoms described under I. INHALATION

B. First aid: see pink pages, section 11

IV. SPLASHING IN EYES

The ORGANOPHOSPHATE and CARBAMATE COMPOUNDS are rapidly absorbed by mucous membranes of the eyes and can cause generalized poisoning within a short period of time.

A. Immediate signs and symptoms

1. Irritation
2. Watering of eyes
3. Blurred vision

These are quickly followed by the symptoms described under I. INHALATION

B. First aid: see blue pages, section 9

| | |
|------------------------|------------------|
| Lead (dust and fumes) | Lead Dioxide |
| Lead Acetate | Lead Nitrate |
| Lead Antimonate | Lead Oxide (PbO) |
| Lead Arsenate | Lead Oxide (red) |
| Lead Carbonate | Lead Oxychloride |
| Lead Chromate | Lead Subacetate |
| Lead Chromate (yellow) | Lead Sulfide |

These substances are toxic to the kidneys, nerves, muscles, and blood. The water-soluble salts and the oxides react with gastric juices (HCl) and cause gastrointestinal irritation and lead poisoning.

As a result of inhalation, ingestion, and skin contact, these substances may eventually cause chronic lead poisoning.

I. INHALATION

Poisoning may be caused when these compounds are in the form of fine dust as well as by their decomposition products during heating or cleaning.

A. Signs and symptoms of acute poisoning

1. Slight irritation of nose and eyes
2. Headache
3. Stomach cramps
4. Fatigue
5. Seizures
6. Confusion
7. Coma
8. Death

B. First aid: see yellow pages, Section 6

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Metallic taste in mouth
2. Constriction of throat

- 3 Stomach pain
- 4 Nausea and vomiting, occasionally of blood
- 5 Cramping abdominal pain
- 6 Diarrhea
- 7 Seizures
- 8 Coma
- 9 Death

B. *First aid:* see *green* pages, section 2

III. SKIN CONTACT

A. Immediate signs and symptoms

1. Irritation
2. Inflammation

B. *First aid:* see *pink* pages, section 2

IV. SPLASHING IN EYES

The insoluble salts of lead are mechanical irritants whereas the soluble salts are chemical irritants to the eyes.

A. Immediate signs and symptoms

1. Irritation and redness
2. Watering of eyes
3. Inflammation of eyelids

B. *First aid:* see *blue* pages, section 6

| | |
|-------------------------------|----------------------------|
| Acetone Cyanohydrin | Ferrocyanides |
| Acetonitrile | Hydrocyanic Acid |
| Acrylonitrile | Isobutyronitrile |
| Adiponitrile | Malononitrile |
| Bitter Almond Oil (Amygdalin) | Methacrylonitrile |
| Cherry Laurel Water | Nitroferricyanides (salts) |
| Cyanogen Bromide | Potassium Cyanide |
| Cyanogen Chloride | Sodium Cyanide |
| Cyanogen Iodide | Tetramethyl Succinonitrile |
| Ferricyanides | |

HYDROCYANIC ACID, POTASSIUM CYANIDE, and SODIUM CYANIDE are fast-acting, highly toxic substances that interfere with the use of oxygen by living cells. This can be the result of either inhalation or ingestion.

ACRYLONITRILE is toxic when inhaled and highly irritating to skin and eyes.

The FERRICYANIDES and FERROCYNANIDES are less toxic.

I. INHALATION

A. Symptoms of very acute poisoning

1. Victim cries out before losing consciousness
2. Victim falls to the ground
3. Wheezing
4. Foaming at mouth
5. Violent convulsions
6. Almost immediate death

B. Signs and symptoms of acute poisoning

1. Excitement phase
 - headache
 - breath smells of bitter almond
 - dizziness
 - nausea, occasionally vomiting

- rapid breathing
- anxiety and excitement
- 2. Depression phase
 - difficulty in breathing
 - chest pain
 - drowsiness
- 3. Convulsion phase
 - convulsions
 - jaws clenched together
 - foaming at mouth
 - loss of consciousness
- 4. Paralysis phase
 - deep coma
 - dilated pupils
 - weak and irregular pulse
 - breathing stops
 - death

If the subject survives, there is risk of permanent nervous system damage.

C. Signs and symptoms of slight poisoning

- 1. Headache
- 2. Dizziness
- 3. Anxiety
- 4. Difficulty in breathing

D. First aid: see yellow pages, section 8

II. INGESTION

A. Signs and symptoms

See symptoms described under I. INHALATION, B and C

- 1. Burning tongue and mouth

2 Salivation

3 Nausea

B. First aid: see *green* pages, section 11

III. SKIN CONTACT

A. Signs and symptoms

The gaseous and liquid compounds are quickly absorbed by the skin and cause symptoms described under I. INHALATION, B and C.

Depending on their nature, they can be very or only slightly irritating.

1. Large blisters (ACRYLONITRILE)

B. First aid: see *pink* pages, section 8

IV. SPLASHING IN EYES

When absorbed by mucous membranes of the eyes, these compounds can cause the same symptoms described in I. INHALATION, C.

A. Immediate signs and symptoms

1. Irritation

2. Watering of eyes

B. First aid: see *blue* pages, section 5

| | |
|---------------------------|--------------------------|
| Chlorophenoxy Compounds | Nitroglycerin |
| DNBP | Nitroresolic Herbicides |
| DNOC | Nitrophenolic Herbicides |
| Dinitrocresols | Nitrophenols |
| Dinitrophenols | Pentachlorophenate |
| Ethyl Nitrate | Pentachlorophenol |
| Ethylene Glycol Dinitrate | Propyl Nitrate |
| Methyl Nitrate | |

These nitro-organic or chlorophenolic compounds may inhibit phosphate bonds and consequently interfere with the way that cells use oxygen, causing high fever.

They are irritating to lungs, skin, and eyes and may cause damage in liver and kidneys.

I. INHALATION

A. Signs and symptoms of acute poisoning

1. Irritation of nose
2. Headache
3. Coughing
4. Profuse sweating
5. Thirst
6. Intense fatigue
7. High fever
8. Rapid pulse
9. Warm flushed skin
10. Rapid, difficult breathing
11. Anxiety and confusion
12. BLUISH face and lips; YELLOW in the case of DINITROCREOLS only
13. Convulsions

14. Loss of consciousness
 15. Risk of fluid in lungs (severe pulmonary edema) if victim survives
 16. Death due to heart failure
- B. First aid: see yellow pages, section 4**

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Burning sensation in mouth and throat
2. Salivation
3. Dizziness
4. Headache
5. Nausea and vomiting
6. High fever with warm, flushed skin
7. Profuse sweating
8. Thirst
9. Rapid and difficult breathing
10. BLUISH face and lips; YELLOW in the case of DNOC only
11. Rapid pulse
12. Intense fatigue
13. Anxiety and confusion
14. Convulsions
15. Loss of consciousness
16. Risk of fluid in lungs (pulmonary edema) if victim survives
17. Death

B. First aid: see green pages, section 7

III. SKIN CONTACT

These substances can all be absorbed through healthy skin, especially when they are dissolved in organic solvents. They may cause delayed symptoms identical to those described under I. INHALATION

A. Immediate signs and symptoms

1. Irritation
2. Redness and swelling
3. Blisters

B. Delayed signs and symptoms

See I. INHALATION

C. *First aid: see pink pages, section 6*

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Burning pain in eyes
2. Irritation
3. Watering of eyes
4. Inflammation of eyelids

B. *First aid: see blue pages, section 3*

Disodium Phosphate
Magnesium Chloride
Magnesium Sulfate

Sodium Sulfate
Sodium Thiocyanate
Sodium Thiosulfate

These compounds are crystalline, water-soluble, and considered nontoxic and nonirritating to skin and mucous membranes.

Except for SODIUM THIOCYANATE, they are cathartics and consequently used as first aid to accelerate the elimination of toxic products from the intestines. MAGNESIUM SULFATE and SODIUM SULFATE are most frequently used.

I. INHALATION

A. Immediate signs and symptoms

1. Mild nose irritation with sneezing

B. First aid: see yellow pages, section 6

II. INGESTION

A. Signs and symptoms

1. Diarrhea

B. First aid: none needed

III. SKIN CONTACT

Although these substances are not irritating to skin, it is advisable to avoid prolonged contact with them in powder form or concentrated solutions.

A. First aid: see pink pages, section 7, or see pink pages, section 8 (THIOCYANATES only)

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

- 1 Mechanical irritation
2. Watering of eyes

B. *First aid:* see *blue* pages, section 6, or see *blue* pages, section 5 (SODIUM THIOCYANATE only)

Aluminum Alkyls
Diethylaluminum Chloride
Diethylaluminum Hydride

Triethylaluminum
Triisobutylaluminum
Trimethylaluminum

These substances occur as liquids at room temperatures. They are generally diluted with a hydrocarbon-type solvent and kept in a nitrogen atmosphere according to very strict safety regulations.

These compounds burst spontaneously and almost instantaneously into flames as soon as they come into contact with atmospheric oxygen or water and give off nontoxic fumes of ALUMINUM OXIDE (see white pages, section 14).

I. INHALATION OF FUMES

A. Signs and symptoms of acute inhalation

1. Sneezing
2. Slight irritation of nose

B. *First aid:* see yellow pages, section 6

II. INGESTION

Unlikely because of strict handling requirements.

III. SKIN CONTACT

Unlikely because of the protective equipment required during handling of the product. However, if ignition of the product occurs:

A. Immediate signs and symptoms

1. Third-degree burns (irreparable damage to tissues)
2. State of shock
 - weak and rapid pulse
 - cold sweat—pale complexion

- lightheadedness
- cold hands and feet

3. Loss of consciousness

4. Death

B. First aid: see *pink* pages, section 10

IV. SPLASHING IN EYES

Unlikely because of the protective equipment required during handling of the product.

A. Immediate signs and symptoms

1. Burning, by flames, of face and eyelids
2. Excruciating pain
3. Swelling of eyelids
4. Possible injury of eyes and impairment of vision

B. First aid: see *blue* pages, section 8

Alkanes (liquids/solids)
Asphalt Fumes
Chloronaphthalenes
Diphenyl
Diphenylamine

Hexachlorobenzene
Paraffins
Polybrominated Biphenyls (PBBs)
Polychlorinated Biphenyls (PCBs)

These substances are oily liquids and waxy solids. They are soluble in organic solvents. They are considered to present little risk on acute exposure

I. INHALATION

A. Signs and symptoms of severe poisoning

1. Irritation of nose
2. Headache
3. Nausea may occur
4. Coughing

B. First aid: see yellow pages, section 2

II. INGESTION

Only the amines in the list above are slightly irritating to mucous membranes of the digestive system.

A. Signs and symptoms of severe poisoning

1. Slight irritation of stomach
2. Nausea, occasionally vomiting
3. General fatigue

B. First aid: see green pages, section 10

III. SKIN CONTACT

In solution in organic solvents, these substances will slowly penetrate the skin. The immediate symptoms that can be observed are the result of poisoning by the solvent used.

A. *First aid:* see pink pages, section 6, or pink pages, section 9, per Chemical Index

IV. SPLASHING IN EYES

A. Immediate signs and symptoms

1. Mechanical irritation
2. Watering of eyes

B. *First aid:* see blue pages, section 6

Dipyridyl Chloride
Dipyridyl Dimethyl Sulfate
Diquat

Gramoxone
Paraquat
Quaternary Ammonium Compounds

The pesticides belonging to the dipyridyl group are not volatile. Their solutions are highly toxic when inhaled, and particularly when ingested, while resorption through healthy skin is relatively slow.

They are irritating to eyes, and toxic to liver, kidneys, and lungs.

I. INHALATION

A. Signs and symptoms of acute poisoning

1. Irritation of nose and eyes
2. Sneezing
3. Nose bleed
4. Painful obstruction of throat

B. *First aid: see yellow pages, section 4*

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Burning sensation in mouth and throat
2. Irritation of mucous membranes
3. Difficulty in swallowing
4. Burning sensation in stomach
5. Nausea and vomiting, possibly of blood
6. Painful abdominal cramps
7. Diarrhea, may be blood-stained
8. There is risk of serious lesions in

- the liver
- the kidneys
- the lungs (fatal chemical pneumonia)

B. *First aid:* see *green* pages, section 2, or *green* pages, section 5, per Chemical Index

III. SKIN CONTACT

A. Immediate symptoms

1. Irritation
2. Inflammation
3. Painful blisters

B. *First aid:* see *pink* pages, section 6

IV. SPLASHING IN EYES

A. Immediate symptoms

1. Painful burning sensation
2. Watering of eyes
3. Inflammation
4. Sensitivity to light

B. *First aid:* see *blue* pages, section 5

| | |
|---------------|--------------------------|
| Aldrin | Dimethylhydrazine (1,1-) |
| Aminopyridine | Hydrazine |
| Camphor | Lindane |
| Chlordane | Organochlorines |
| Decaborane | Pentaborane |

These pesticides and chemicals can be absorbed through intact skin as well as by inhalation and ingestion. Their major target is the nervous system and convulsions may be the first symptom.

I. INHALATION

A. Signs and symptoms of acute poisoning

1. Apprehension and excitability
2. Dizziness
3. Headache
4. Numbness and weakness in limbs
5. Muscle twitching
6. Convulsions
7. Shallow, slow respirations
8. Pallor
9. BLUISH face
10. Respirations cease
11. Death

B. First aid: see yellow pages, section 5, or yellow pages, section 4 per Chemical Index.

II. INGESTION

A. Signs and symptoms of acute poisoning

1. Nausea and vomiting
2. See signs and symptoms in I. INHALATION

B. *First aid:* see *green* pages, section 5

III. SKIN CONTACT

A. Immediate signs and symptoms

1. Apprehension and anxiety
2. Tremors
3. Confusion
4. Seizures
5. Slow or shallow breathing
6. BLUISH face

B. *First aid:* see *pink* pages, section 2, or *pink* pages, section 6, per Chemical Index

IV. EYE CONTACT

A. Immediate signs and symptoms

1. Irritation of eyes and eyelids
2. See signs and symptoms in section III. SKIN CONTACT

B. *First aid:* see *blue* pages, section 5