

Poisoning

Poison

► What Is a Poison?

The American Association of Poison Control Centers defines a **poison** (also known as a toxin) as anything that can harm someone if it is: (1) used in the wrong way, (2) used by the wrong person, or (3) used in the wrong amount.

Poisons can be classified by how they enter the body:

- Ingested (swallowed)—through the mouth
- Inhaled (breathed)—through the lungs
- Injected—through needlelike device (eg, snake's fangs, bee's stinger)
- Absorbed (direct contact)—through the skin or eyes

Poisons come in four forms: solids (such as pain medicine pills or tablets), liquids (such as household cleaners, including bleach), sprays (such as spray cleaners), and gases (such as carbon monoxide [CO]).

Most consumer products are safe if label directions are followed, but some can be poisonous if used incorrectly. The most common poisons are not necessarily the most dangerous ones. Some of the more dangerous poisons that could be found in a home include the following:

- Antifreeze and windshield washer products
- Some medicines
- Corrosive cleaners such as drain openers, oven cleaners, toilet bowl cleaners, and rust removers
- Fuels such as kerosene, lamp oil, gasoline
- Pesticides

chapter *at a glance*

- **Poison**
- **Alcohol Emergencies**
- **Drug Emergencies**
- **Carbon Monoxide Poisoning**
- **Plant-Induced Dermatitis: Poison Ivy, Poison Oak, and Poison Sumac**

► Ingested (Swallowed) Poisons

Ingested poisoning occurs when the victim swallows a toxic substance. Fortunately, most poisons have little toxic effect or are ingested in such small amounts that severe poisoning rarely occurs. However, the potential for severe or fatal poisoning is always present. About 80% of all poisonings happen by ingesting a toxic substance **Figure 1**.

Recognizing Ingested Poisoning

The following are signs of ingested poisoning:

- Abdominal pain and cramping
- Nausea or vomiting
- Diarrhea

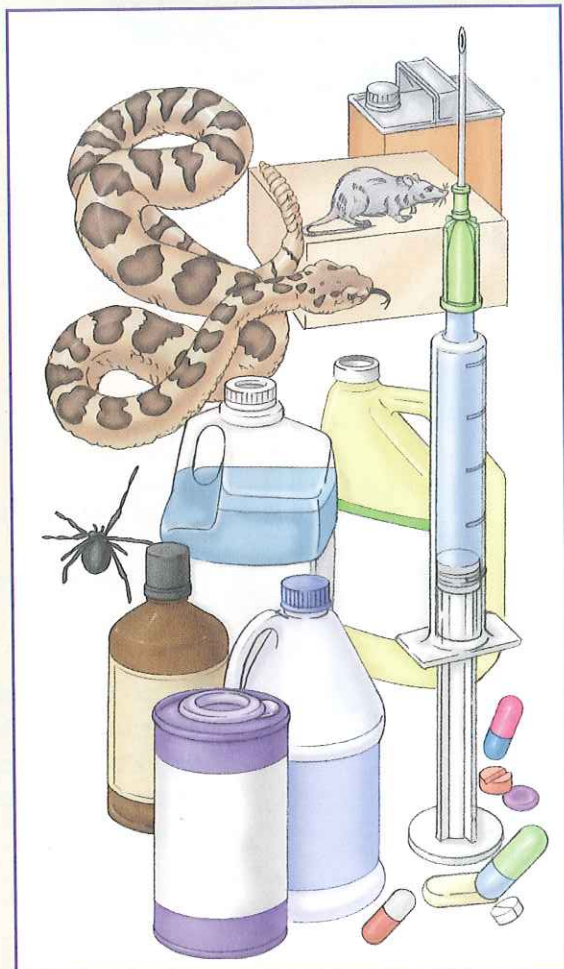


Figure 1

Sources of poisons.

FYI

Poisoning: Where Can You Call for Help?

If someone swallows poison, do not call the hospital emergency department. Call the poison center. Researchers who made 156 test calls to 52 hospital emergency departments in Illinois found that the advice given was correct only 64% of the time. Calls to the same emergency department on different days for the same problem did not consistently produce the same advice. In contrast, poison centers gave correct advice in 17 (94%) of 18 test calls.

Source: Wigder H N, Erickson T, Morse T, Saporta V. Emergency department poison advice telephone calls. *Ann Emerg Med* 25:349-352.

- Burns, odor, or stains around and in the mouth
- Drowsiness or unconsciousness
- Seizure
- Poison container nearby

Care for Ingested Poisoning Victims

If you think someone has been poisoned:

1. Check the condition of the victim. Call 9-1-1 immediately if the person:
 - Has collapsed (is unresponsive)
 - Is having trouble breathing; monitor for breathing and, if absent, begin CPR
 - Has severe pain in the chest
 - Shows other life-threatening signs
2. Call **Poison Help** (1-800-222-1222) even if there are no signs of poisoning. Try to identify what poison is involved. If possible, bring its container to the phone.

CAUTION

DO NOT give water or milk to dilute poisons other than caustic or corrosive substances (acids and alkalis) unless told to do so by staff at a poison center. Fluids can dissolve a dry poison such as tablets or capsules more rapidly and fill up the stomach, forcing the stomach contents (the poison) into the small intestine, where it will be absorbed faster. Vomiting and aspiration could occur.

CAUTION

DO NOT gag or tickle the back of the victim's throat with a finger or a spoon handle. This method is usually ineffective in causing vomiting, and any vomiting produced is not very forceful.

DO NOT give dish soap, raw eggs, or mustard powder. They are not effective.

DO NOT use syrup of ipecac.

3. A nurse, pharmacist, or other poison expert will answer your call. Be ready to tell the person:
 - The name of the product (found on the container's label)
 - The amount of product involved (eg, half the bottle, a dozen tablets)
 - How long ago the poison contacted the victim
 - The age and weight of the victim
 - What signs of poisoning you notice
4. A poison expert will decide whether the person is in danger. The poison expert will give you the advice you need and may stay on the phone with you while you get help or call you later to follow up.
5. Most calls (about 70%) can be handled outside of a hospital. If you need a physician or an ambulance, the poison expert will tell you right away.



Figure 2

The left-side position delays the advance of the poison into the small intestine.

6. Place the victim on his or her left side (recovery position) (Figure 2). For ingested poisoning, the left side is best because it positions the end of the stomach where it enters the small intestine (pylorus) straight up. Gravity will delay (by as much as 2 hours) the advance of the poison into the small intestine, where absorption into the victim's circulatory system is faster. The side position also helps prevent aspiration (inhalation) into the lungs if vomiting begins.
7. Save poison containers, plants, and the victim's vomitus to help medical personnel identify the poison.

Alcohol Emergencies

▶ Alcohol Intoxication

Alcohol is a depressant, not a stimulant. It affects a person's judgment, vision, reaction time, and coordination. In very large amounts, it can cause death by paralyzing the respiratory center of the brain.

Alcohol is the most commonly used and abused drug in the United States, possibly even the world. It is also one of the most lethal because it is implicated as a cofactor in up to 40% of drownings, over 40% of

CAUTION

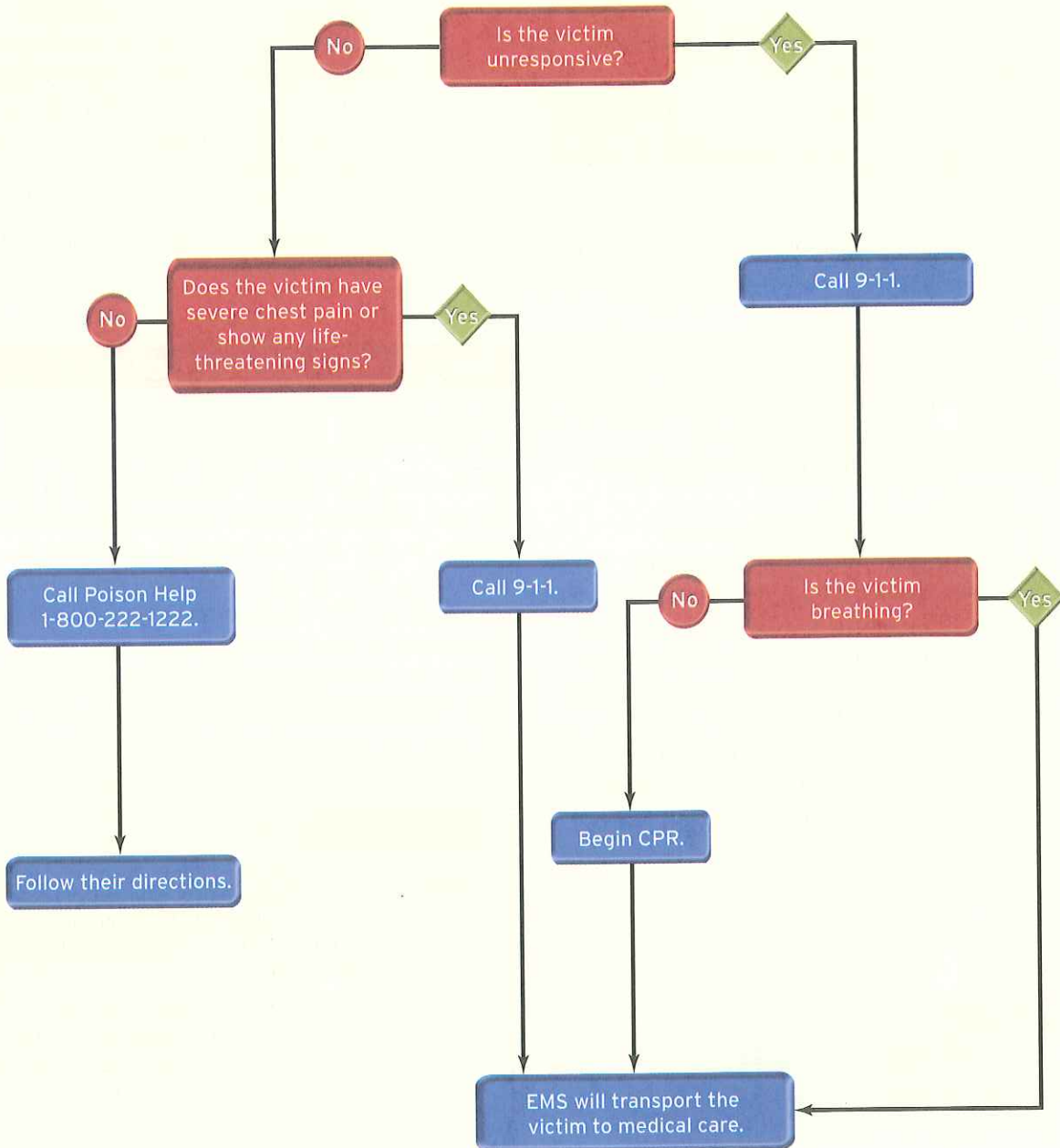
DO NOT follow the first aid procedures or recommendations on a container label without first getting confirmation from a medical source. Many labels are incorrect or out of date.

DO NOT try to neutralize a poison. Giving weak acids, such as lemon juice or vinegar, is not safe, contrary to the advice given on many drain cleaner and lye product labels. Chemical neutralization releases large quantities of heat that can burn sensitive tissues.

DO NOT think that a specific antidote exists for most poisons. An antidote is a substance that counteracts a poison's effects. Few poisons have specific antidotes that will effectively block their toxic effects.

DO NOT think that there is a universal antidote. No product is effective in treating most or all poisons.

Poisoning (Ingested)



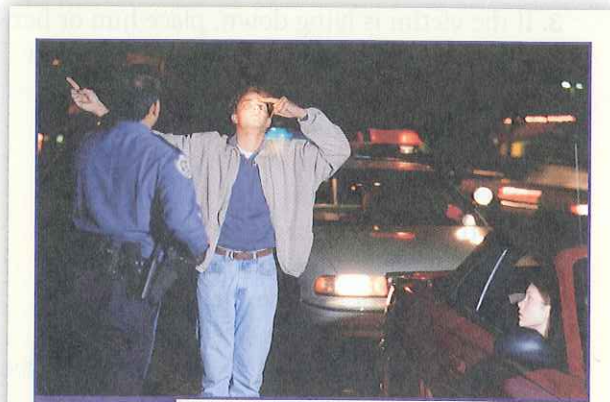


Figure 3

Drunk driving test.

traffic deaths **Figure 3**, 67% of homicides, and 33% of suicides. It directly affects more than 12 million people annually (10% of all males and 3% of all females) and causes more than 200,000 deaths. Alcohol abuse is a major national health problem, ranking with heart disease and cancer. Lack of data makes it difficult to assess the actual number of alcohol-related injuries. It is estimated, however, that about 25% of the patients treated in hospital emergency departments were for intoxication alone. Nearly 50% of patients in trauma centers were injured while under the influence of alcohol.

Helping an intoxicated person is often difficult because the person could be belligerent and combative. However, it is important that people who abuse alcohol be helped and not labeled as drunks. Their condition can be quite serious, even life-threatening.

Occasionally, a person will have consumed so much alcohol that there are signs of central nervous system depression. In such cases, complete respiratory support might be necessary. Death can result from the excessive consumption of alcohol.

The consumption of alcohol is deeply embedded in our society. Because of the widespread use of alcohol, people whose lives are affected directly or indirectly by alcohol abuse should be educated so they can recognize problems and know what to do in an emergency.

Recognizing Intoxication

Although the following signs indicate alcohol intoxication, some might also mean illness or injury other than alcohol abuse, such as diabetes or heat injury:

- The odor of alcohol on a person's breath or clothing

CAUTION

DO NOT let an intoxicated person sleep on his or her back.

DO NOT leave an intoxicated person alone unless he or she becomes violent.

DO NOT try to handle a hostile intoxicated person by yourself. Find a safe place, and then call the police for help.

- Unsteady, staggering walking
- Slurred speech and the inability to carry on a conversation
- Nausea and vomiting
- Flushed face

Seizures can result from alcohol ingestion or alcohol withdrawal. Any seizures related to alcohol require medical evaluation. Diabetic coma can mimic alcohol intoxication, as can poisoning and neurologic problems.

Care for Intoxicated Individuals

First aid for an intoxicated person includes these steps:

1. Look for any injuries. Alcohol can mask pain.
2. Monitor breathing and treat accordingly.
3. If the intoxicated person is lying down, place him or her in the recovery (left-side) position to reduce the likelihood of vomiting and aspiration of vomit and to delay the absorption of alcohol into the bloodstream. Be sure to check that the victim is breathing and does not have a spinal injury before you move him or her. The recovery position can be used for responsive and unresponsive persons.
4. Call the poison center for advice or the local emergency number for help. It might be best to let EMS personnel decide whether the police should be alerted.
5. If the victim becomes violent, leave the scene and find a safe place until police arrive.
6. Provide emotional support.
7. Assume that an injured or unresponsive victim has a spinal injury and needs to be stabilized against movement. Because of decreased pain perception, an intoxicated victim cannot be assessed reliably. If you suspect a spinal injury, wait for EMS personnel to arrive. They have

the proper equipment and training to stabilize and move a victim.

8. Because many intoxicated people have been exposed to the cold, suspect hypothermia (dangerously low body temperature) and move the person to a warm place whenever possible. Remove wet clothing and cover the person with warm blankets. Handle a hypothermic victim gently because rough handling could induce a deadly heart rhythm.

Drug Emergencies

Drugs are classified according to their effects on the user:

- Uppers are stimulants of the central nervous system. They include amphetamines, cocaine, and caffeine.
- Downers (sedative-hypnotic) are depressants of the central nervous system. They include barbiturates, tranquilizers, marijuana, and narcotics.
- Hallucinogens alter and often enhance the sensory and emotional information in the brain centers. They include LSD (lysergic acid diethylamide), mescaline, peyote, and PCP (phencyclidine hydrochloride, or angel dust). Marijuana also has some hallucinogenic properties.
- Volatile chemicals usually are inhaled and can cause serious damage to many body organs. They include plastic model glue and cement, paint solvent, gasoline, spray paint, and nail polish remover.

Recognizing Drug Overdose

The condition of a person suffering from drug overdose may be quite serious, even life-threatening. The signs of drug overdose include the following:

- Drowsiness, anxiety, or agitation
- Dilated (large) or constricted (small) pupils
- Confusion
- Hallucinations

Care for a Drug Overdose

Care for a drug overdose is the same as that for alcohol intoxication:

1. Look for injuries. Drugs can mask pain.
2. Monitor breathing.

3. If the victim is lying down, place him or her in the recovery position. Rolling the victim onto the left side not only reduces the likelihood of vomiting and aspiration of vomit, but also delays absorption of drugs into the bloodstream.
4. Call the poison control center (1-800-222-1222) for advice or 9-1-1 for help.
5. Provide emotional support, but if the victim becomes violent, leave the scene, call 9-1-1, and find a safe place until police arrive.
6. If the victim has been exposed to the cold, suspect hypothermia and move the person to a warm environment whenever possible. Remove wet clothing and cover the individual with warm blankets. Handle a hypothermic victim gently because rough handling could induce a cardiac arrest.

Carbon Monoxide Poisoning

Carbon monoxide (CO), because of its common presence in our environment, along with its insidious nature, is the leading cause of poisoning death in the United States each year. Carbon monoxide is an odorless, colorless, nonirritating gas produced by the incomplete combustion of carbon-based fuels.

Recognizing Carbon Monoxide Poisoning

It is difficult to determine whether a person is a victim of CO poisoning. Sometimes, a complaint of having the flu is really a symptom of CO poisoning. Although many symptoms of CO poisoning resemble those of the flu, there are differences. For example, CO poisoning does not cause low-grade fever or generalized aching or involve the lymph nodes.

The signs and symptoms of CO poisoning are as follows:

- Headache
- Ringing in the ears (tinnitus)
- Chest pain (angina)
- Muscle weakness
- Nausea and vomiting
- Dizziness and visual changes (blurred or double vision)
- Unresponsiveness
- Respiratory and cardiac arrest

The traditionally cited sign of CO poisoning is cherry-red skin and lips. This sign is uncommon,

however, and occurs only at death; therefore, it is a poor initial indicator of CO poisoning. The following are earmarks of possible CO poisoning:

- The symptoms come and go.
- The symptoms worsen or improve in certain places or at certain times of the day.
- People around the victim have similar symptoms.
- Pets seem ill.

Care for Carbon Monoxide Poisoning Victims

1. Get the victim out of the toxic environment and into fresh air immediately.
2. Call 9-1-1, who will send EMS personnel who will be able to give the victim 100% oxygen, improving oxygenation and disassociating the linkage between the CO and the hemoglobin. For a responsive victim, it takes 4 to 5 hours with ordinary air (21% oxygen) or 30 to 40 minutes with 100% oxygen to reverse the effects of CO poisoning.
3. Monitor breathing.
4. Place an unresponsive breathing victim in the recovery position.
5. Seek medical care. All suspected victims of CO poisoning should obtain a blood test to determine the level of CO.

Plant-Induced Dermatitis: Poison Ivy, Poison Oak, and Poison Sumac

About 85% of the population is sensitive to poison ivy, poison oak, and poison sumac. If a person reaches adulthood without experiencing a reaction, the risk falls from 85% to 50%. With more people venturing into the outdoors, episodes of dermatitis caused by exposure to poison ivy, poison oak, and poison sumac are increasing (Figure 4, Figure 5, Figure 6). (Actually, more than 60 plants can cause allergic reactions, but these three are by far the most common offenders.) Of those who do react, 15–25% will have incapacitating swelling and blistering eruptions that require medical care (Figure 7). There is no routine test to determine an individual's degree of sensitivity—a history of dermatitis is the most reliable indicator.



Figure 4

Poison ivy, found in all 48 contiguous states in the United States.



Figure 5

Poison oak.



Figure 6

Poison sumac.



Figure 7

Poison ivy dermatitis.

Recognizing Plant-Induced Dermatitis

Most people do not realize they have come in contact with a poisonous plant until the rash erupts. Reactions can range from mild to severe.

- Mild: itching
- Mild to moderate: itching and redness
- Moderate: itching, redness, and swelling
- Severe: itching, redness, swelling, and blisters

Severity is important, but so is the amount of skin affected. The greater the amount of skin affected, the greater the need for medical care. A day or two is the usual time between contact and the onset of signs and symptoms.

Care for Plant-Induced Dermatitis

To care for someone who has been in contact with poisonous plants:

1. People who know they have been in contact with a poisonous plant should wash the skin with soap and water as soon as possible (within 5 minutes for sensitive people and within 1 hour for moderately sensitive people). Unfortunately, most victims do not know about their contact until several hours or days later, when the itching and rash begin. Use soap and water to cleanse the skin of the oily resin or apply rubbing (isopropyl) alcohol liberally (not in swab-type dabs). If too little isopropyl alcohol is

CAUTION

DO NOT use nonprescription hydrocortisone creams, ointments, and sprays in strengths of less than 1%. They offer little benefit.

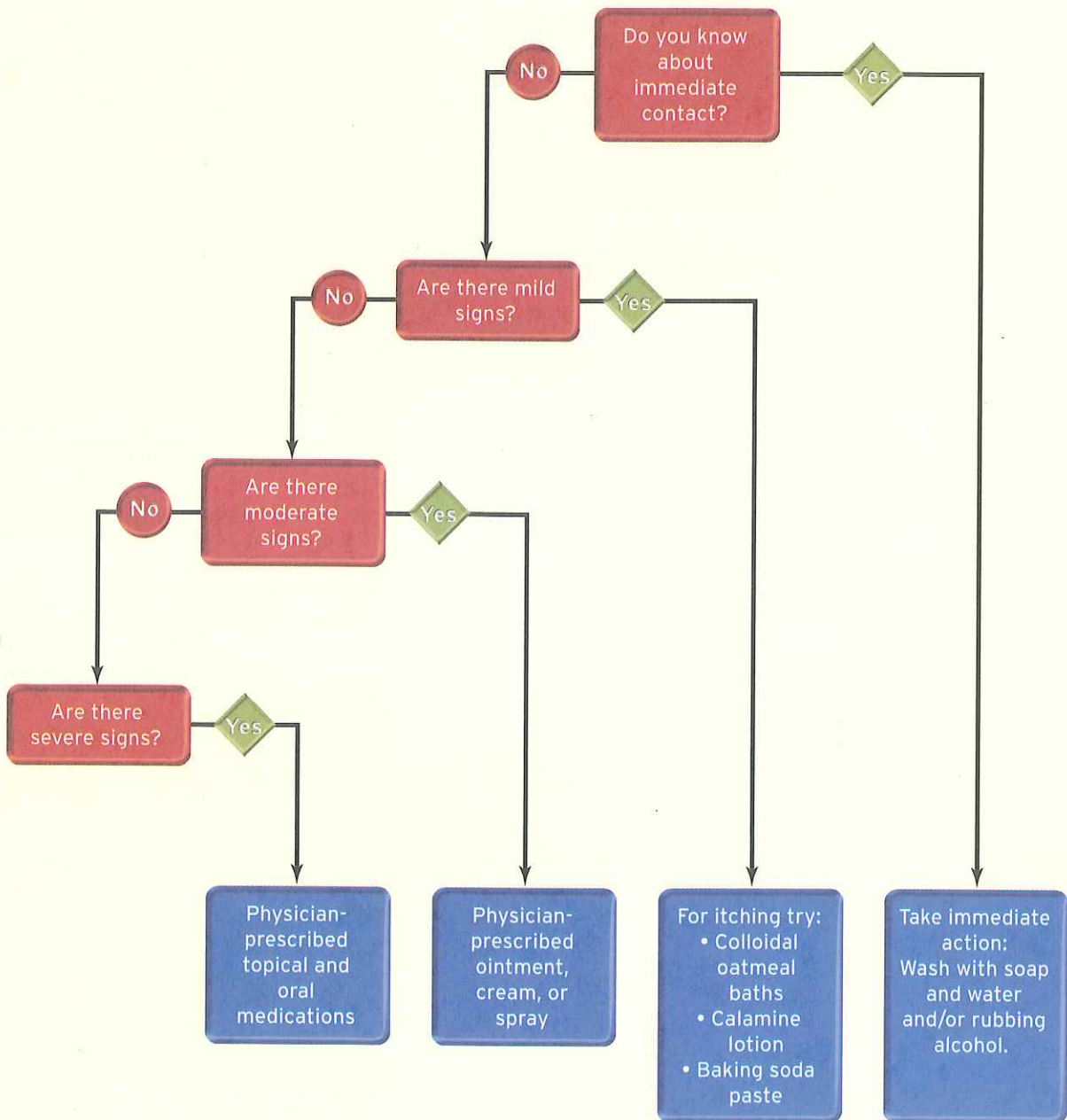
DO NOT use over-the-counter anti-itch lotions that also have antihistamines because they can cause further skin irritation. Oral antihistamines often are used in conjunction with prescription creams to help decrease itching.

DO NOT let the victim rub or scratch the rash or itching skin.

used, the oil will be spread to another site and enlarge the injury. Other solvents, such as paint thinner, can be used, but they can irritate or damage the skin. Rinse with water to remove the solubilized material. Water removes urushiol from the skin, oxidizes and inactivates it, and does not penetrate the skin (as solvents do).

2. For a mild reaction, have the victim soak in a lukewarm bath sprinkled with 1 to 2 cups of colloidal oatmeal. Colloidal oatmeal makes a tub slick, so take appropriate precautions. Or, apply one of the following:
 - Wet compresses soaked with aluminum acetate for 20 to 30 minutes three or four times a day
 - Calamine lotion (calamine ointment if the skin becomes dry and cracked) or zinc oxide
 - Baking soda paste: 1 teaspoon of water mixed with 3 teaspoons of baking soda
3. For a mild to moderate reaction, care for the skin as you would for a mild reaction and use a physician-prescribed corticosteroid ointment.
4. For a severe reaction, care for the skin as you would for mild and moderate reactions and use a physician-prescribed oral corticosteroid such as prednisone. Apply a physician-prescribed topical corticosteroid ointment or cream, cover the area with a transparent plastic wrap, and lightly bind the area with an elastic or self-adhering bandage. A physician-prescribed antihistamine can be used for itching.

Poison Ivy, Oak, and Sumac



► Emergency Care Wrap-up

Condition	What to Look For	What to Do
Ingested (swallowed) poisoning	<p>Abdominal pain and cramping</p> <p>Nausea or vomiting</p> <p>Diarrhea</p> <p>Burns, odor, or stains around and in mouth</p> <p>Drowsiness or unresponsiveness</p> <p>Poison container nearby</p>	<p>Determine the age and size of the victim, what and how much was swallowed, and when it was swallowed.</p> <p>If victim is responsive, call the poison control center at 1-800-222-1222. The center will advise what you should do and whether medical care is needed.</p> <p>If the victim is unresponsive, open airway, check breathing, and treat accordingly. If breathing, place on left side in recovery position. Call 9-1-1.</p>
Alcohol intoxication	<p>Alcohol odor on breath or clothing</p> <p>Unsteadiness, staggering</p> <p>Confusion</p> <p>Slurred speech</p> <p>Nausea and vomiting</p> <p>Flushed face</p>	<p>If the victim is responsive:</p> <ul style="list-style-type: none"> • Monitor breathing. • Look for injuries. • Place in recovery position. • Call poison control center for advice (1-800-222-1222). • If victim becomes violent, leave area and call 9-1-1. <p>If victim is unresponsive, open airway, check breathing, and treat accordingly.</p>
Drug overdose	<p>Drowsiness, agitation, anxiety, hyperactivity</p> <p>Change in pupil size</p> <p>Confusion</p> <p>Hallucinations</p>	<p>If the victim is responsive:</p> <ul style="list-style-type: none"> • Monitor breathing. • Look for injuries. • Place in recovery position. • Call poison control center for advice (1-800-222-1222). • If victim becomes violent, leave area and call 9-1-1. <p>If victim is unresponsive, open airway, check breathing, and treat accordingly.</p>
Carbon monoxide poisoning	<p>Headache</p> <p>Ringing in ears</p> <p>Chest pain</p> <p>Muscle weakness</p> <p>Nausea and vomiting</p> <p>Dizziness and vision difficulties</p> <p>Unresponsiveness</p> <p>Breathing and heart stopped</p>	<p>Move victim to fresh air.</p> <p>Call 9-1-1.</p> <p>Monitor breathing.</p> <p>Place unresponsive breathing victim in recovery position.</p>
Plant (contact) poisoning	<p>Rash</p> <p>Itching</p> <p>Redness</p> <p>Blisters</p> <p>Swelling</p>	<p>For known contact, immediately wash with soap and water.</p> <p>For mild reaction, use one or more:</p> <ul style="list-style-type: none"> • 1–2 cups of colloidal oatmeal in bathwater • Calamine lotion • Baking soda paste <p>For severe reactions, perform step 2 and seek medical care.</p>

► Ready for Review

- A poison is any substance that impairs health or causes death by its chemical action when it enters the body or comes in contact with the skin.
- Poisons are classified by how they enter the body. They can be ingested, inhaled, absorbed, and injected.
- Ingested poisoning occurs when the victim swallows a toxic substance.
- Alcohol is a depressant that affects a person's judgment, vision, reaction time, and coordination.
- Drugs are classified according to their effects on the user:
 - Uppers (stimulants)
 - Downers (depressants)
 - Hallucinogens
 - Volatile chemicals
- Carbon monoxide is the leading cause of poisoning death in the United States each year.
- About 85% of the population is sensitive to poison ivy, poison oak, and poison sumac.

► Vital Vocabulary

carbon monoxide A colorless, odorless, poisonous gas formed by incomplete combustion, such as in fire.

ingested poisoning Poisoning caused by swallowing a toxic substance.

poison Any substance that impairs health or causes death by its chemical action when it enters the body or comes in contact with the skin; also known as a toxin.

Poison Help Medical facility providing immediate, free, expert advice any time; can be reached by calling 1-800-222-1222.

prep kit

► Assessment in Action

You have been helping your sister paint three rooms in her home. While taking a break, your 2-year-old niece enters the room with a small cup of paint used for touch up. There is paint around and inside her mouth.

Directions: Circle Yes if you agree with the statement; circle No if you disagree.

- Yes No 1. Immediately give your niece water or milk to dilute the ingested paint.
- Yes No 2. Use syrup of ipecac to induce vomiting.
- Yes No 3. Determine how much of the paint was swallowed, when it was swallowed, and the age and size of the victim.
- Yes No 4. Call the poison control center for advice (1-800-222-1222).

► Check Your Knowledge

Directions: Circle Yes if you agree with the statement; circle No if you disagree.

- Yes No 1. Swallowing a poison can produce nausea.
- Yes No 2. Milk should be given to all victims of ingested poison.
- Yes No 3. A victim of alcohol intoxication does not require medical care.
- Yes No 4. Carbon monoxide has a unique smell.
- Yes No 5. Everyone who touches a poison ivy, poison oak, or poison sumac plant will have some type of skin reaction.
- Yes No 6. Causing a poisoned victim to vomit is a recommended first aid practice.
- Yes No 7. Some cases of poison ivy, poison oak, or poison sumac require medical care.
- Yes No 8. Calamine lotion can help relieve itching caused by poison ivy, poison oak, or poison sumac.
- Yes No 9. If an intoxicated or drugged person becomes violent, leave the area.
- Yes No 10. Move a victim of carbon monoxide poisoning to fresh air.