

**Carbon Disulfide (CS<sub>2</sub>)**  
**CAS 75-15-0; UN 1131**

Synonyms include carbon bisulfide, carbon sulfide, and dithiocarbonic anhydride.

- **Persons exposed only to carbon disulfide vapor pose no risk of secondary contamination. Persons whose skin or clothing is contaminated with liquid carbon disulfide can secondarily contaminate rescuers by direct contact or through off-gassing of vapor.**
- **At room temperature, carbon disulfide is a very flammable liquid that readily evaporates when exposed to air. Gaseous carbon disulfide is more than twice as heavy as air. Pure carbon disulfide liquid is colorless with a pleasant odor. Most industrially-used carbon disulfide is yellowish in color and has an unpleasant sulfurous odor imparted by impurities. Odors of carbon disulfide usually provide adequate warning of its presence.**
- **Carbon disulfide is readily absorbed through the upper respiratory tract. Carbon disulfide can also be readily absorbed through the digestive tract or skin.**

**Description**

At room temperature, carbon disulfide is a very flammable liquid that readily evaporates when exposed to air. Gaseous carbon disulfide is more than twice as heavy as air. Pure carbon disulfide liquid is colorless with a pleasant odor. Most industrially-used carbon disulfide liquid is yellowish in color and has an unpleasant foul-smelling odor, characteristic of hydrogen sulfide (a contaminant of technical grade carbon disulfide). Most people can smell carbon disulfide vapors at levels as low as 0.02 to 0.1 ppm. Carbon disulfide is handled and transported as a very flammable and explosive liquid.

**Routes of Exposure**

*Inhalation*

Inhalation is the major route of exposure to carbon disulfide. The vapors are readily absorbed by the lungs. The odor threshold is approximately 200 to 1,000 times lower than the OSHA PEL-TWA (20 ppm). Odors of pure or commercial grades of carbon disulfide usually provide adequate warning of hazardous concentrations. Significant exposures to carbon disulfide occur primarily in occupational settings. Acute exposure to carbon disulfide vapors can be irritating to the eye, mucous membranes, and respiratory epithelium. Acute exposure to concentrations that are orders of magnitude higher than the OSHA exposure limit may cause severe neurological effects such as headache, confusion, psychosis, coma,

and even death. Being more than twice as heavy as air, carbon disulfide vapors may be more concentrated in low-lying areas.

Children exposed to the same levels of carbon disulfide as adults may receive larger doses because they have relatively greater lung surface area:body weight ratios and higher minute volume:weight ratios. In addition, they may be exposed to higher levels than adults in the same location because of their short stature and the higher levels of carbon disulfide found nearer to the ground.

*Skin/Eye Contact*

Contact with liquid or concentrated vapors of carbon disulfide may cause irritation of the skin, eyes, and mucous membranes. In extreme exposure cases, direct contact may cause chemical burning of skin, eyes, or mucous membranes. Direct contact may result in significant dermal absorption. Significant inhalation or dermal exposure to carbon disulfide would most likely be encountered in an industrial environment, particularly during rayon production.

Because of their relatively larger surface area:weight ratio, children are more vulnerable to toxicants absorbed through the skin.

*Ingestion*

Ingestion of carbon disulfide in amounts as small as 15 mL may result in the death of an adult. Premortem symptoms include respiratory difficulty, tremors, convulsions, and coma. Humans are unlikely to be exposed to significant quantities of carbon disulfide in food or water.

**Sources/Uses**

Carbon disulfide is a natural product of anaerobic biodegradation. It is also synthesized via the catalyzed reaction between sulfur and methane at 600 °C. Carbon disulfide is used in the manufacture of viscose rayon, cellophane, carbon tetrachloride, dyes, and rubber. Some solvents, waxes, and cleaners contain carbon disulfide. It is also used as an insecticide.

**Standards and Guidelines**

OSHA PEL (permissible exposure limit) = 20 ppm (averaged over an 8-hour workshift); 30 ppm (acceptable ceiling concentration); 100 ppm (30-minute maximum peak)

NIOSH IDLH (immediately dangerous to life or health) = 500 ppm

AIHA ERPG-2 (maximum airborne concentration below which it is believed that nearly all persons could be exposed for up to 1 hour without experiencing or developing irreversible or other serious

health effects or symptoms that could impair their abilities to take protective action) = 50 ppm

### Physical Properties

*Description:* Colorless to slightly yellowish liquid at room temperature; volatile, flammable, explosive in air

*Warning properties:* Sweet odor of pure carbon disulfide and foul odor of commercial and technical grade carbon disulfide are usually adequate to warn of acute. Most people can detect carbon disulfide at levels of 0.02 to 0.1 ppm (1 ppm is equivalent to 3.1 mg/m<sup>3</sup>).

*Molecular weight:* 76.14 daltons

*Boiling point* (760 mm Hg): 115.3 °F (46.3 °C)

*Freezing point:* -168.9 °F (-111.6 °C)

*Vapor pressure:* 352.6 mm Hg at 77 °F (25 °C)

*Vapor density:* 2.67 g/mL (air = 1.00)

*Water solubility:* soluble in ethanol, methanol, benzene, and ether; only slightly soluble in water (0.23 g/100 mL at 71.6 °F [22 °C])

*Flammability:* LEL 1.3%; Flashpoint -22 °F (-30 °C)

### Incompatibilities

Carbon disulfide is incompatible with air, alkali metals, aluminum, azides, many oxidants, and phenyl copper-triphenylphosphine complexes. Such incompatible mixtures may result in violent, and possibly explosive, reactions.



## Health Effects

- **Carbon disulfide is irritating to the eyes, mucous membranes, and skin. Acute neurological effects may result from all routes of exposure and may include headache, confusion, psychosis, and coma. Acute exposure to extremely high levels of carbon disulfide may result in death.**
- **The neurotoxic effects caused by carbon disulfide may be due, in part, to its metabolic conversion to dithiocarbamates. Individuals especially susceptible to the toxic effects of carbon disulfide include those with existing disorders of the nervous system, respiratory system, cardiovascular system, or eyes.**

### Acute Exposure

Mechanisms of toxicity have not been clearly elucidated for carbon disulfide, but are thought to be the result of the formation of carbon disulfide metabolites such as dithiocarbamates and/or derivatives. Most absorbed carbon disulfide is rapidly metabolized; there appears to be no substantial delay in the onset of adverse effects following acute exposure to high levels of carbon disulfide. Direct contact with carbon disulfide results in local irritation, which may be severe in cases of high-level exposure. Acute exposure to high concentrations of carbon disulfide may result in rapid onset of both local irritation and concentration-dependent increased severity of neurological symptoms such as nausea, dizziness, headache, delusions, hallucinations, delirium, mania, psychosis, blurred vision, convulsions, and coma.

Children do not always respond to chemicals in the same way that adults do. Different protocols for managing their care may be needed.

### CNS

Absorption of large amounts of carbon disulfide results in rapid onset of severe neurological symptoms such as nausea, dizziness, headache, delusions, hallucinations, delirium, mania, psychosis, blurred vision, convulsions, and coma. These symptoms are dependent upon both exposure concentration and duration and may occur following inhalation, oral, or dermal exposure. Death has been reported from exposure to a vapor concentration of 4,815 ppm for 30 minutes. An exposure of 500 ppm for 30 minutes may cause a situation immediately dangerous to life and health. Death due to carbon disulfide poisoning may occur, in part, as a result of respiratory paralysis.

*Respiratory*

Acute exposure to carbon disulfide vapor concentrations of several hundred parts per million may result in irritation of the upper respiratory tract.

Children may be more vulnerable to gas exposure because of higher minute ventilation per kg and failure to evacuate an area promptly when exposed.

*Ocular/Ophthalmic*

Conjunctivitis and corneal burns can result from the irritant effect of carbon disulfide vapor and from direct exposure to the liquid. Degenerative changes of the retina and optic nerve may also result from acute exposure.

*Dermal*

Carbon disulfide is a skin irritant that causes pain, redness, and blisters, especially on mucous membranes. Carbon disulfide dissolves fatty layers of the epidermis. Therefore, second and third degree chemical burns may result from direct contact during high-level exposure.

Because of their relatively larger surface area:body weight ratio, children are more vulnerable to toxicants that affect the skin.

*Gastrointestinal*

Nausea, vomiting, and abdominal pain have been reported after acute exposure to carbon disulfide.

**Chronic Exposure**

Chronic exposure to carbon disulfide can result in neurological effects similar to those experienced during acute exposure, but at much lower exposure levels. In addition, chronic exposure may cause effects such as permanent central and peripheral nervous system damage, atherosclerotic tendencies, ECG abnormalities, gastrointestinal disturbances, fatty degeneration of the liver, kidney damage, sexual dysfunction, hearing loss, visual disturbances, retinal microaneurism, and blood dyscrasia. Chronic exposure may be more serious for children because of their potential for a longer latency period.

*Carcinogenicity*

A carcinogenicity classification for carbon disulfide has not been established by the Department of Health and Human Services, the International Association for Research on Cancer, or the U.S. EPA.

*Reproductive and  
Developmental Effects*

Carbon disulfide is included in the list of *Reproductive and Developmental Toxicants*, a 1991 report published by the U.S. General Accounting Office that lists 30 chemicals of concern

because of widely acknowledged reproductive and developmental consequences. Carbon disulfide-induced reproductive effects include alterations of the menstrual cycle in women and altered libido and abnormalities in spermatogenesis in men. There is no conclusive evidence that carbon disulfide is a genotoxin in humans.



## Prehospital Management

- **Persons exposed only to carbon disulfide vapor pose no risk of secondary contamination to rescuers. Persons whose skin or clothing is contaminated with liquid carbon disulfide can secondarily contaminate response personnel by direct contact or through off-gassing of vapor.**
- **Carbon disulfide is severely irritating to the eyes, mucous membranes, and skin. Acute neurological effects may result from all routes of exposure and may include headache, confusion, psychosis, and coma. Acute exposure to extremely high levels of carbon disulfide may result in respiratory failure and death.**
- **There is no antidote for carbon disulfide. Treatment consists of removal of the victim from the contaminated area, support of respiratory and cardiovascular functions, and irrigation of contaminated eyes or skin.**

### Hot Zone

Rescuers should be trained and appropriately attired before entering the Hot Zone. If the proper equipment is not available, or if the rescuers have not been trained in its use, call for assistance from a local or regional hazardous materials (HAZMAT) team or other properly equipped response organization.

### Rescuer Protection

Inhaled carbon disulfide is readily absorbed and is a respiratory tract irritant. Contamination of the skin or eyes can cause chemical burns. Carbon disulfide is readily absorbed through the skin.

*Respiratory protection:* Positive-pressure, self-contained breathing apparatus (SCBA) is recommended in response to situations that involve exposure to potentially unsafe levels of carbon disulfide gas.

*Skin protection:* Fully encapsulated chemical-protective clothing is recommended because carbon disulfide can cause skin irritation and burns.

### ABC Reminders

Quickly establish a patent airway, ensure adequate respiration and pulse. Maintain adequate circulation. Provide supplemental oxygen if cardiopulmonary compromise is suspected. If trauma is suspected, maintain cervical immobilization manually and apply a cervical collar and a backboard when feasible. Apply direct pressure to stop bleeding.

### Victim Removal

If victims can walk, lead them out of the Hot Zone to the Decontamination Zone. Victims who are unable to walk should be

removed on backboards or gurneys. If these are not available, carefully carry or drag victims to safety.

Consider appropriate management of anxiety in victims with chemically-induced acute disorders, especially children who may suffer separation anxiety if separated from a parent or other adult.

**Decontamination Zone**

Patients exposed only to carbon disulfide gas who have no eye or skin irritation do not need decontamination. They may be transferred immediately to the Support Zone. Other patients will require decontamination as described below.

*Rescuer Protection*

If exposure levels are determined to be safe, decontamination may be conducted by personnel wearing a lower level of protection than that required in the Hot Zone (described above).

*ABC Reminders*

Quickly establish a patent airway, ensure adequate respiration and pulse. Maintain adequate circulation. If trauma is suspected, maintain cervical immobilization manually and apply a cervical collar and a backboard when feasible. Administer supplemental oxygen as required or if cardiopulmonary compromise is suspected. Assist ventilation with a bag-valve-mask device if necessary. Apply direct pressure to control bleeding.

*Basic Decontamination*

**Rapid skin decontamination is critical.** Victims who are able may assist with their own decontamination. Remove contaminated clothing and personal belongings and place them in double plastic bags.

Gently wash exposed skin and hair with copious amounts of water (preferably under a cool shower). Use caution to avoid hypothermia when decontaminating victims, particularly children or the elderly. Use blankets or warmers after decontamination as needed.

Irrigate exposed eyes with copious amounts of tepid tap water for at least **15 minutes**. Remove contact lenses if they are easily removable without additional trauma to the eye. If pain or injury is evident, continue irrigation while transferring the victim to the Support Zone.

In cases of ingestion, **do not induce emesis**. Rinse the mouth and administer water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. If the victim is not symptomatic, administer activated charcoal at a dose of 1 g/kg (infant, child, and

adult dose). A soda can and straw may be of assistance when offering charcoal to a child.

Consider appropriate management of chemically contaminated children at the exposure site. Also, provide reassurance to the child during decontamination, especially if separation from a parent occurs.

#### *Transfer to Support Zone*

As soon as basic decontamination is complete, move the victim to the Support Zone.

#### **Support Zone**

Be certain that victims have been decontaminated properly (see *Decontamination Zone*, above). Victims who have undergone decontamination or have been exposed only to carbon disulfide vapors pose no serious risk of secondary contamination to rescuers. In such cases, Support Zone personnel require no specialized protective gear. The Support Zone team should wear disposable aprons or gowns and latex gloves.

#### *ABC Reminders*

Quickly establish a patent airway. If trauma is suspected, maintain cervical immobilization manually and apply a cervical collar and a backboard when feasible. Ensure adequate respiration and pulse. Administer supplemental oxygen as required and establish intravenous access if necessary. Place on a cardiac monitor.

#### *Additional Decontamination*

Continue irrigating exposed skin and eyes, as appropriate.

In cases of ingestion, **do not induce emesis**. Rinse the mouth and administer water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. If the victim is not symptomatic, administer activated charcoal at a dose of 1 g/kg (infant, child, and adult dose). A soda can and straw may be of assistance when offering charcoal to a child.

#### *Advanced Treatment*

In cases of respiratory compromise secure airway and respiration via endotracheal intubation. If not possible, perform cricothyrotomy if equipped and trained to do so.

Treat patients who have bronchospasm with an aerosolized bronchodilator such as albuterol.

Patients who are comatose, hypotensive, or having seizures or cardiac arrhythmias should be treated according to advanced life support (ALS) protocols when clinically indicated. Avoid

epinephrine and related beta agonists (unless patient is in cardiac arrest or has reactive airways disease refractory to other treatment) because of the possible irritable condition of the myocardium, which may lead to ventricular fibrillation.

If evidence of shock or hypotension is observed, begin fluid administration. For adults with systolic pressure less than 80 mm Hg, bolus perfusion of 1,000 mL/hour intravenous saline or lactated Ringer's solution may be appropriate. Higher adult systolic pressures may necessitate lower perfusion rates. For children with compromised perfusion, administer a 20 mL/kg bolus of normal saline over 10 to 20 minutes, then infuse at 2 to 3 mL/kg/hour.

### *Transport to Medical Facility*

Only decontaminated patients or patients not requiring decontamination should be transported to a medical facility. "Body bags" are not recommended.

Report the condition of the patient, treatment given, and estimated time of arrival at the medical facility to the base station and the receiving medical facility.

If carbon disulfide has been ingested, prepare the ambulance in case the victim vomits toxic material. Have ready several towels and open plastic bags to quickly clean up and isolate vomitus.

### **Multi-Casualty Triage**

Consult with the base station physician or the regional poison control center for advice regarding triage of multiple victims.

Patients who have histories or evidence suggesting significant exposure (e.g., altered behavior, respiratory distress, or chemical burns) should be transported to a medical facility for evaluation. Patients who have a history of chronic pulmonary disease should be clinically evaluated for airflow obstruction.

Patients who have symptoms of mild or transient skin, nose, or eye irritation may be discharged from the scene after their names, addresses, and telephone numbers are recorded. They should be advised to rest and to seek medical care promptly if symptoms develop or recur (see *Patient Information Sheet* below).

## Emergency Department Management

- **Persons exposed only to carbon disulfide vapor pose no risk of secondary contamination to rescuers. Persons whose skin or clothing is contaminated with liquid carbon disulfide can secondarily contaminate response personnel by direct contact or through off-gassing of vapor.**
- **Carbon disulfide is severely irritating to the eyes, mucous membranes, and skin. Acute neurological effects may result from all routes of exposure and may include headache, confusion, psychosis, and coma. Acute exposure to extremely high levels of carbon disulfide may result in respiratory failure and death.**
- **There is no antidote for carbon disulfide. Treatment consists of removal of the victim from the contaminated area, support of respiratory and cardiovascular functions, and irrigation of contaminated eyes or skin.**

### Decontamination Area

Previously decontaminated patients and those exposed only to carbon disulfide vapor who have no skin or eye irritation may be transferred immediately to the Critical Care Area. Others require decontamination as described below.

Be aware that use of protective equipment by the provider may cause anxiety, particularly in children, resulting in decreased compliance with further management efforts.

Because of their relatively larger surface area:body weight ratio, children are more vulnerable to toxins absorbed through the skin. Also emergency department personnel should examine children's mouths because of the frequency of hand-to-mouth activity among children.

### *ABC Reminders*

Evaluate and support the airways, breathing, and circulation. Provide supplemental oxygen if cardiopulmonary compromise is suspected. In cases of respiratory compromise secure airway and respiration via endotracheal intubation. If not possible, perform cricothyrotomy if equipped and trained to do so.

Treat patients who have bronchospasm with an aerosolized bronchodilator such as albuterol.

Patients who are comatose, hypotensive, or are having cardiac arrhythmias should be treated according to established emergency department protocols. Treat seizures with diazepam.

*Basic Decontamination*

Patients who are able may assist with their own decontamination.

Because carbon disulfide can cause burns, ED staff should don chemical-resistant jumpsuits (e.g., of Tyvek or Saranex) or butyl rubber aprons, rubber gloves, and eye protection if the patient's clothing or skin is wet. After the patient has been decontaminated, no special protective clothing or equipment is required for ED personnel.

Quickly remove contaminated clothing while gently washing the skin with water (preferably under a cool shower). Double-bag the contaminated clothing and personal belongings. Carbon disulfide dissolves fatty layers of the epidermis; therefore, chemical burns are likely. Handle burned skin with caution.

Wash exposed skin and hair thoroughly with soap and cool water. If pain or injury is evident, continue irrigation while transferring the victim to the Critical Care Area. Use caution to avoid hypothermia when decontaminating victims, particularly children or the elderly. Use blankets or warmers after decontamination as needed.

Flush exposed or irritated eyes with copious amounts of tepid water for at least **15 minutes**. Remove contact lenses if easily removable without additional trauma to the eye. If pain or injury is evident, continue irrigation while transferring the victim to the Critical Care Area.

In cases of ingestion, **do not induce emesis**. Rinse the mouth and administer water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. If the victim is not symptomatic, administer activated charcoal at a dose of 1 g/kg (infant, child, and adult dose). A soda can and straw may be of assistance when offering charcoal to a child.

**Critical Care Area**

Be certain that appropriate decontamination has been carried out.

*ABC Reminders*

Evaluate and support the airways, breathing, and circulation as in *ABC Reminders* above. Establish intravenous access in seriously ill patients. Continuously monitor cardiac rhythm.

Patients who are comatose, hypotensive, or are having seizures or cardiac arrhythmias should be treated in the conventional manner.

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<i>Inhalation Exposure</i>	Administer supplemental oxygen by mask to patients who have respiratory complaints. Treat patients who have bronchospasm with an aerosolized bronchodilator such as albuterol.
<i>Skin Exposure</i>	<p>If concentrated carbon disulfide is in contact with the skin, chemical burns may result; treat as thermal burns.</p> <p>Because of their relatively larger surface area:body weight ratio, children are more vulnerable to toxicants that affect the skin.</p>
<i>Eye Exposure</i>	Continue irrigation for at least <b>15 minutes</b> . Test visual acuity. Examine the eyes for corneal injury (burn) and treat appropriately. Immediately consult an ophthalmologist for patients who have suspected severe corneal injuries.
<i>Ingestion</i>	<p><b>Do not induce emesis.</b> Consider endoscopy to evaluate the extent of gastrointestinal-tract injury. Extreme throat swelling may require endotracheal intubation or cricothyrotomy. Gastric lavage is useful in certain circumstances to remove caustic material and prepare for endoscopic examination. Consider gastric lavage with a small nasogastric (NG) tube if: (1) a large dose has been ingested; (2) the patient is evaluated within 30 minutes; (3) the patient has oral lesions or persistent esophageal discomfort; and (4) the lavage can be administered within 1 hour of ingestion. Care must be taken when placing the gastric tube because blind gastric-tube placement may further injure the chemically damaged esophagus or stomach.</p> <p>If the victim is not symptomatic, administer activated charcoal at a dose of 1 g/kg (infant, child, and adult dose). A soda can and straw may be of assistance when offering charcoal to a child.</p>
<i>Antidotes and Other Treatments</i>	There is no antidote for carbon disulfide. Treatment is supportive of respiratory and cardiac function.
<i>Laboratory Tests</i>	Routine laboratory studies include chest radiography, electrocardiogram, blood chemistry, and arterial blood gases.
<b>Disposition and Follow-up</b>	Consider hospitalizing symptomatic patients who have evidence of respiratory or cardiac distress, seizures, changes in mental status, or significant chemical burns.

*Delayed Effects* Acute exposure to high concentrations of carbon disulfide result in immediate adverse effects. However, some of the common manifestations of acute high-level exposure may be delayed.

*Patient Release* Patients who become totally asymptomatic in terms of pulmonary complaints in a 6- to 8-hour observation period are not likely to develop complications. They may be released and advised to rest and to seek medical care promptly if symptoms develop (see the *Carbon Disulfide—Patient Information Sheet* below). Cigarette smoking can exacerbate pulmonary injury and should be discouraged for 72 hours after exposure.

*Follow-up* Obtain the name of the patient's primary care physician so that the hospital can send a copy of the record of the ED visit to the patient's doctor.

Follow-up evaluation of respiratory function should be arranged for severely exposed patients. Patients who have skin or corneal injuries should be reexamined within 24 hours.

**Reporting** If a work-related incident has occurred, you might be legally required to file a report; contact your state or local health department.

Other persons might still be at risk in the setting where this incident occurred. If the incident occurred in the workplace, discussing it with company personnel might prevent future incidents. If a public health risk exists, notify your state or local health department or other responsible public agency. When appropriate, inform patients that they may request an evaluation of their workplace from the Occupational Safety and Health Administration (OSHA) or the National Institute for Occupational Safety and Health (NIOSH).

## **Carbon Disulfide (CS<sub>2</sub>) Patient Information Sheet**

This handout provides information and follow-up instructions for persons who have been exposed to carbon disulfide.

### **What is carbon disulfide?**

Carbon disulfide is a very flammable liquid that readily evaporates when exposed to air. Pure carbon disulfide liquid is colorless with a pleasant odor. Most industrially-used carbon disulfide liquid is yellowish in color and has an unpleasant foul-smelling odor. Carbon disulfide has many industrial and agricultural uses. Most potential for exposure comes from its use in the rayon-producing industry. It is shipped and handled as a flammable and explosive liquid in a special container.

### **What immediate health effects can be caused by exposure to carbon disulfide?**

Inhaling carbon disulfide causes irritation to the nose, eyes, throat, and lungs. Typical symptoms include sore throat, runny nose, burning eyes, and cough. Inhaling high levels can cause difficulty breathing. Skin contact with carbon disulfide vapor or liquid can cause irritation or burns. Acute neurological effects may result from inhalation, ingestion, or skin contact and may include headache, confusion, psychosis, and coma. Acute exposure to extremely high levels of carbon disulfide may result in death.

### **Can carbon disulfide poisoning be treated?**

There is no antidote for carbon disulfide, but its effects can be treated and most acutely-exposed persons recover completely. Persons who have inhaled large amounts of carbon disulfide might need to be hospitalized. Persons who have come into direct skin or eye contact with carbon disulfide liquid or vapors may need to be treated for skin or eye chemical burns.

### **Are any future health effects likely to occur?**

A single exposure from which a person recovers quickly is not likely to cause delayed or long-term effects.

### **What tests can be done if a person has been exposed to carbon disulfide?**

Specific tests for the presence of carbon disulfide in blood or urine are not generally useful. If a severe exposure has occurred, blood analyses, x-rays, and breathing tests might show whether the lungs have been injured. The level of a metabolite of carbon disulfide (2-thiazolidine-4-carboxylic acid) can be measured in the urine, but can not be used to determine the degree of exposure to carbon disulfide.

### **Where can more information about carbon disulfide be found?**

More information about carbon disulfide can be obtained from your regional poison control center; your state, county, or local health department; the Agency for Toxic Substances and Disease Registry (ATSDR); your doctor; or a clinic in your area that specializes in occupational and environmental health. If the exposure happened at work, you may wish to discuss it with your employer, the Occupational Safety and Health Administration (OSHA), or the National Institute for Occupational Safety and Health (NIOSH). Ask the person who gave you this form for help in locating these telephone numbers.

### Follow-up Instructions

Keep this page and take it with you to your next appointment. Follow *only* the instructions checked below.

- Call your doctor or the Emergency Department if you develop any unusual signs or symptoms within the next 24 hours, especially:
  - ▼ eye, nose, throat irritation
  - ▼ coughing or wheezing
  - ▼ difficulty breathing or shortness of breath
  - ▼ chest pain or tightness
  - ▼ nausea, vomiting, diarrhea, or stomach pain
  - ▼ dizziness, incoordination, blurred vision
  - ▼ mood or behavioral changes
  - ▼ headache

No follow-up appointment is necessary unless you develop any of the symptoms listed above.

Call for an appointment with Dr. \_\_\_\_\_ in the practice of \_\_\_\_\_.  
When you call for your appointment, please say that you were treated in the Emergency Department at \_\_\_\_\_ Hospital by \_\_\_\_\_ and were advised to be seen again in \_\_\_\_\_ days.

Return to the Emergency Department/ \_\_\_\_\_ Clinic on (date) \_\_\_\_\_ at \_\_\_\_\_ AM/PM for a follow-up examination.

Do not perform vigorous physical activities for 1 to 2 days.

You may resume everyday activities including driving and operating machinery.

Do not return to work for \_\_\_\_\_ days.

You may return to work on a limited basis. See instructions below.

Avoid exposure to cigarette smoke for 72 hours; smoke may worsen the condition of your lungs.

Avoid drinking alcoholic beverages for at least 24 hours; alcohol may worsen injury to your stomach or have other effects.

Avoid taking the following medications: \_\_\_\_\_

You may continue taking the following medication(s) that your doctor(s) prescribed for you: \_\_\_\_

\_\_\_\_\_

Other instructions: \_\_\_\_\_

\_\_\_\_\_

• Provide the Emergency Department with the name and the number of your primary care physician so that the ED can send him or her a record of your emergency department visit.

• You or your physician can get more information on the chemical by contacting: \_\_\_\_\_  
\_\_\_\_\_ or \_\_\_\_\_, or by checking out the following Internet  
Web sites: \_\_\_\_\_;

Signature of patient \_\_\_\_\_ Date \_\_\_\_\_

Signature of physician \_\_\_\_\_ Date \_\_\_\_\_