

Carbon Monoxide Poisoning

Carbon Monoxide (CO) is a colorless, odorless and tasteless gas that is potentially lethal. It is possible to become exposed to CO gas through several different household appliances and industrial equipment if they are operating improperly. Deaths due to CO poisoning have declined over the past three decades, however, CO poisoning is still recognized as a totally preventable occurrence. Several preventative measures can be taken to reduce your risk to CO.

Why is carbon monoxide hazardous?

CO is a leading cause of accidental poisoning, primarily because it is not detectable by our senses, and because it can be produced by many common devices.

The main health danger presented by CO is asphyxia. CO will bind with the oxygen carrying hemoglobin in the blood over 200 times easier than with oxygen, rendering the hemoglobin incapable of transporting oxygen, and leading to suffocation. Because of this increased affinity of hemoglobin for CO, the concentration of CO in the blood could reach a much higher concentration than the concentration of CO in the surrounding air.

Common sources of carbon monoxide

CO is a byproduct of the incomplete burning of carbon containing fuels such as: gasoline, natural gas, oil, kerosene, coal, and wood. This incomplete burning is usually the result of a lack of sufficient fresh air for the combustion process.

The common sources of CO include: fireplaces, wood and coal burning stoves, and any gas fired appliances such as furnaces, hot water heaters, ranges, and dryers. Other sources include exhaust from cars and trucks and other gasoline engines. Propane powered fork trucks are a common source of CO in warehouse and manufacturing facilities. On construction sites, equipment such as portable generators, concrete finishers, and other equipment powered by small gasoline engines can produce very high levels of CO especially in poorly ventilated areas. Space heaters are another cause of carbon monoxide poisonings.

Recognizing symptoms of possible carbon monoxide exposure

The possibility of CO poisoning should be investigated if there are any complaints of symptoms similar to those listed in the chart below. Those particularly vulnerable to CO include the unborn, infants, and people with anemia or a history of heart disease.

Concentration in air	Effect
200 ppm	Possible mid frontal headache in 2-3 hours.
400 ppm	Frontal headache and nausea after 1 to 2 hours. Occipital after 2 ½ to 3½ hours.
800 ppm	Headache, dizziness, and nausea in 45 minutes. Collapse and possible unconsciousness in 2 hours.
1600 ppm	Headache, dizziness, and nausea in 20 minutes. Collapse and possible death in 2 hours.
3200 ppm	Headache and dizziness in 5 to 10 minutes. Unconsciousness and danger of death in 30 minutes.
6400 ppm	Headache and dizziness in 1 to 2 minutes. Unconsciousness and danger of death in 10 to 15 minutes.
12800 ppm	Immediate unconsciousness. Danger of death in 1 to 3 minutes.

What to do if exposed to carbon monoxide gas

Evacuate the area immediately and go outside for fresh air. The effects of initial stage CO poisoning are quickly reversible upon exposure to fresh air.

If symptoms persist, see a physician or get to an emergency room immediately. Tell the physician you suspect CO poisoning. If CO poisoning has occurred, it can often be diagnosed by a blood test completed soon after exposure.

Contact an ambulance if victims are unconscious or show evidence of severe poisoning. Contact the utilities or other emergency professionals to address the cause of the exposure and to prevent reoccurrence.

How to prevent carbon monoxide poisoning

- Never use a generator inside an enclosed structure.
- Properly install, maintain, and operate all fuel burning appliances.
- Have heating systems and chimneys annually inspected by a licensed contractor to ensure they are in safe working order.
- Inspect and tune vehicle exhaust systems annually.
- Never use a charcoal grill, hibachi, gas fueled lantern or portable camping stove inside an enclosed area.
- Use electric or pneumatic powered tools instead of gasoline powered equipment in enclosed areas.
- If a gas powered tool or equipment must be used in a partially enclosed area such as a construction site, fans or mechanical ventilation systems should be used to supply fresh air to the area.
- Install carbon monoxide alarms on systems supplying breathing air for respirators. Ensure that the alarms are inspected and working properly.
- Install an Underwriters Laboratory Listed CO detector and replace batteries semi-annually.
- Never leave the motor running of a vehicle parked in an enclosed or semi-enclosed area.

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