

Fire Prevention - Carbon Monoxide

What is carbon monoxide?

Carbon monoxide (CO) is an invisible, odorless gas. It is a common by-product of incomplete combustion, produced when fossil fuels (like oil, gas or coal) burn. Because you can't see, taste or smell it, carbon monoxide can kill you before you know it's there. Exposure to lower levels over time can make you sick.

Why is carbon monoxide so dangerous?

Carbon monoxide robs you of what you need most - oxygen, which is carried to your cells and tissue by the hemoglobin in your blood. If you inhale even small amounts of CO, it quickly bonds with hemoglobin and displaces oxygen. This produces a toxic compound in your blood called carboxyhemoglobin (COHb).

Carboxyhemoglobin produces flu-like symptoms, such as headaches, fatigue, nausea, dizzy spells, confusion, and irritability. Since symptoms are similar to the flu, carbon monoxide poisoning can be misdiagnosed. As levels of COHb rise, victims suffer vomiting,, loss of consciousness, and eventually brain damage or death.

Who is at risk from carbon monoxide poisoning?

Everyone - because everyone needs oxygen to survive. Medical experts believe some people are more vulnerable to poisoning, like unborn babies, infants, children seniors, and people with heart and lung problems.

Where does carbon monoxide come from?

CO can be produced by gas or oil appliances like a furnace, clothes dryer, range, oven, water heater, or space heater. When appliances and vents work properly, and there is enough fresh air in your home to allow complete combustion, the trace amounts of CO produced are typically not dangerous. And normally, CO is safely vented outside your home.

Problems arise when something goes wrong. An appliance can malfunction; a furnace heat exchanger can crack; vents can clog, or debris may block a chimney or flue. Fireplaces, wood burning stoves, charcoal grills, or gas logs can produce unsafe levels of CO if they are unvented or not properly vented. Exhaust can seep into the home from vehicles left running in an attached garage. All these sources can contribute to a CO problem in the home.

In some cases, problems arise even if appliances are working properly. The following conditions are dangerous because they can trap exhaust in your home, and are hard to recreate during a CO investigation.

- Incomplete combustion. Fuel-burning appliances need fresh air for complete combustion. If several appliances run at the same time in a well-insulated home, they "compete" for the available fresh air. If the fresh air supply gets low, appliances recirculate each other's exhaust instead of venting CO outside.
- Negative indoor air pressure. When exhaust fans run, they lower the indoor air pressure. If the indoor air pressure gets lower than the outdoor air pressure, the air flow in chimneys and vents can reverse, pulling exhaust containing CO back into the home.
- Loose vent pipes. Vibrations can shake vent pipes loose from gas dryers, furnaces, or water heaters, preventing CO from being vented outside properly.

How can I protect against carbon monoxide poisoning?

Early warning is important. The Consumer Product Safety Commission (CPSC) recommends that every home have at least one carbon monoxide alarm with an audible warning signal installed near the sleeping area. Choose a CO alarm that is Underwriters Laboratories Inc. (UL) Listed. Look for the UL logo on the package.

The International Association of Fire Chiefs recommends UL Listed CO alarms be installed on every level of the home for additional protection.

Have your appliances checked regularly

Have a qualified appliance technician check all fuel burning appliances, furnaces, venting and chimney systems at least once a year, or as recommended by the manufacturer.

How does a carbon monoxide alarm work?

A smoke alarm triggers an alarm immediately when it detects smoke. In a fire, the danger is immediate. A carbon monoxide alarm triggers an alarm based on exposure to CO over time. It is designed to sound an alarm before an average, healthy adult would experience symptoms.

Remember, with carbon monoxide, it is the concentration of CO over time that poses a threat. Since carbon monoxide displaces oxygen in your blood, it can harm you if you are exposed to high levels of CO in a short period of time, or to lower levels of CO over a long period of time.

What do I do if my carbon monoxide alarm goes off?

It is very possible that you won't be experiencing symptoms of CO poisoning when the alarm sounds. That doesn't mean there is no carbon monoxide present. The alarm is supposed to go off before you feel sick, so you have time to react and take action.

Don't panic. Press the Test/Silence button to temporarily quiet the alarm, then call 911 or the Fire Department.

Immediately move everyone to a source of fresh air. Leave the CO alarm where it is (the emergency responders will want to check it when they arrive). Do not re-enter your home until the emergency responder has arrived, your home is aired out, and your CO alarm returns to normal operation.

Have the problem corrected as soon as possible. Keep your home well ventilated until the problem has been fixed.

Where should I install my carbon monoxide alarms?

If you only have one carbon monoxide alarm, install it in the hallway near the sleeping area. Make sure you can hear it from every bedroom so it can awaken everyone if the alarm goes off while you are asleep. Additional alarms on each level of your home provide extra protection.

Carbon monoxide weighs about the same as air, and distributes evenly throughout a room. A CO alarm will be effective if it's on the ceiling, near the baseboard, or anywhere in between. Pick a location where the alarm will stay clean, and out of children's reach.

Do not install a CO alarm right next to a combustion appliance, like a gas or oil furnace, oven, water heater, etc. Install the CO alarm at least 15-20 feet away from these appliances whenever possible.

Do not install a CO alarm where it will be exposed to strong chemical solvents or cleaners, or in areas of high humidity. CO alarms work best when clean and dry.

For plug-in CO alarms, choose outlets that cannot be turned off by a switch or dimmer, since they may not provide continuous power. Choose outlets where the alarm cannot be easily knocked off the wall.

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