

E-Conservation Home Energy Management Series

CARBON MONOXIDE

Carbon monoxide (CO) is an invisible, odorless, colorless gas. While you can't see or smell it, breathing high concentrations of it can kill you and your loved ones within minutes. Even at low levels, carbon monoxide can make you sick.

Sources of Carbon Monoxide

Fuel-burning (also called combustion) appliances emit carbon monoxide. These appliances include gas or oil furnaces and space heaters, gas dryers, gas water heaters, gas stoves, generators, wood stoves and fireplaces. The exhaust from vehicles is also a source of CO. Small amounts of CO are produced whenever fossil fuels such as gas, oil, kerosene, charcoal or wood are burned. When these fuels burn efficiently and are exhausted properly, CO is not a problem. Concern is when the burn is incomplete and/or improperly exhausted and CO leaks inside your house.

Symptoms of CO Poisoning

The symptoms of carbon monoxide poisoning include dizziness, headaches, fatigue, confusion, nausea, and shortness of breath. These symptoms also resemble those of the flu and other common illnesses, so it can be difficult to diagnose without a blood test. You should suspect mild CO poisoning if these types of symptoms disappear when you leave your house and reoccur when you return home.

When you breathe CO, it quickly enters your blood stream and prevents the delivery of oxygen your body needs to function. People with anemia, heart or lung problems, children and unborn babies are particularly susceptible to its deadly effects. Don't take any chances if these symptoms come on quickly and you have reason to suspect CO poisoning. Hesitating can result in the loss of consciousness and death. If CO poisoning is suspected, turn off fuel burning appliances and get everyone out into fresh air immediately. Then, go to an emergency room and tell medical professionals that you believe you have been exposed to CO. Before re-entering your home, make sure you contact a qualified heating contractor to check your fossil fuel appliances.



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Back Drafting

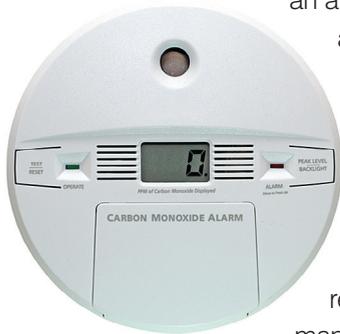
Sometimes, when a fossil fuel appliance is operating at the same time as a powerful exhaust vent, combustion gases can be sucked out of the appliance or pipe and enter the house. This is called appliance back drafting. To protect your family from back drafting, have a trained professional heating contractor perform a safety inspection on all fuel-burning appliances

The contractor should check to make certain:

- All appliances are installed and operating properly.
- All burners receive enough outside/fresh air for complete combustion.
- No appliance produces dangerous levels of CO.
- All vents, chimneys and flues are clear and well-connected.

Prevention, Detection and Inspection

While prevention of CO should be your first priority, you should also install digital CO detectors. Plug-in and battery-powered detectors are designed to sound an alarm when they sense harmful CO levels. Make sure the detectors you buy meet American Gas Association or Underwriters Laboratories (UL2034) standards and *use them as a back-up measure, not as a substitute* for an annual appliance inspection and maintenance. When you purchase the detector, note the life expectancy of the sensor cell located inside the detector. The cell may not last forever and may have to be replaced according to the manufacturer's recommendations.



If your detector is battery-powered, the battery should be tested monthly and replaced annually (just like a smoke detector). Install CO detectors according to the manufacturer's instructions and locations.

When using fossil fuel appliances, look for these warning signs:

- Yellow flame on a gas appliance (it should burn blue).
- Soot build-up on or around your appliance.
- Rust stains and corrosion on vents or chimneys.
- Increased condensation on windows.
- Poor heating or longer running furnace.
- Unfamiliar smells or sounds coming from appliances.

While some CO detectors may look like smoke detectors, their function is completely different. For a safe home, you should have smoke AND carbon monoxide detectors.

Energy Efficiency Concerns

If your home is energy-efficient and is well insulated and air sealed with caulking and weather stripping, you must be extra careful because CO levels can build up rapidly in a tight home. Be certain that all fuel-burning appliances are operating properly.

Other Safety Tips:

- Never use an oven or range as a space heater.
- Never let the car run in an attached garage.
- Never use an unvented heater unless it is equipped with an oxygen depletion sensor and has proper combustion air.
- Never sleep in a room with an unvented gas or kerosene space heater.
- Always make sure unvented space heaters operate in rooms with a window cracked and the door open. (Better yet, avoid using them entirely!)
- Always follow operating and maintenance instructions for combustion appliances.
- Never operate gasoline-powered engines (generators, chain saws, etc.) in enclosed spaces.
- Never use a barbecue or charcoal grill indoors.

SOURCE: Adapted from Carbon Monoxide, E3A: Energy Management for the Home, Montana State University Extension, 2013

ADDITIONAL SOURCE: An Introduction to Air Quality, US Environmental Protection Agency, 2013, <http://www.epa.gov/iaq/co.html>



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