



Emergency Preparedness & Response News

Special Edition

December 2015

Carbon Monoxide ... *The Silent Killer*

What is Carbon Monoxide (CO)?

Carbon monoxide (CO) is an odorless, colorless gas often formed in the process of incomplete combustion of organic substances, including fuels. It is dangerous because it interferes with normal oxygen uptake for humans and other living organisms needing oxygen to live.



Why should I be concerned about Carbon Monoxide (CO)?

CO is a gas that can build up to dangerous concentrations indoors when fuel-burning devices are not properly vented, operated, or maintained. Because it has no odor, color or taste, CO cannot be detected by our senses. It is estimated that unintentional CO exposure accounts for an estimated 500 deaths in the United States each year. Poisoning contributes annually to more than 2,000 deaths in the United States. In addition, the US Consumer Product Safety Commission estimates that 8,000 to 15,000 people each year are examined or treated in hospitals for non-fire related CO poisoning. Breathed over long periods of time, low concentrations of CO may also contribute to other illness. Fortunately, simple measures can be taken to prevent CO problems. One such action is the installation of a CO alarm to detect potentially deadly conditions.

What are the sources of CO?

In general, CO is produced when any material burns. More is produced when there isn't enough oxygen for efficient burning. Common sources of CO in homes include fuel-burning devices such



as: furnaces, gas or kerosene space heaters, boilers, gas cooking stoves, water heaters, clothes dryers, fireplaces, charcoal grills, wood stoves, lawn mowers, power generators, camp stoves, motor vehicles, and some power tools with internal combustion engines. Smoking is another common source of CO that can negatively impact indoor air quality

Historic Routt County Courthouse
522 Lincoln Avenue, Second Floor
P.O. Box 773598
Steamboat Springs, CO 80477

Phone: (970) 870-5551 (Bob Struble)
E-mail: bstruble@co.routt.co.us
Phone: (970) 870-5549 (Cheryl Dalton)
Email: cdalton@co.routt.co.us

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What concentrations of CO are typical in the home?

Ideally, CO concentrations indoors are expected to be the same as CO concentrations outdoors. In the Colorado, annual average outdoor CO concentrations are roughly 0.12 parts per million parts (ppm). This is averaged over an 8-hour period. These averages are below the federal standard of 9

ppm for CO in outdoor air. In general, concentrations are lower in rural areas and higher in urban areas. Finding CO concentrations higher indoors than outdoors indicates an indoor source of CO, or a source very close to your home.

Air Quality Index (AQI) Values	Levels of Health Concern	Colors
When the AQI is in this range:	...air quality conditions are:	...as symbolized by this color:
0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

How can I protect myself and my family from CO poisoning?

Simple measures can be taken to prevent CO problems. Make sure that all your fuel burning appliances and heating devices are properly vented and maintained. Know the symptoms of CO poisoning. Finally, to detect potentially deadly conditions, install and maintain CO alarms in your home in accordance with Colorado's CO alarm law.

1. Properly vent and maintain fuel-burning appliances.

Homes with fuel-burning appliances such as gas furnaces, water heaters, ovens, and fireplaces or homes with attached garage are more likely to have CO problems than those homes not using these appliances. You should have your fuel-burning appliances checked by a qualified heating contractor every year to look for possible problems.

The following signs may indicate a CO problem:

- Streaks of soot around fuel-burning appliances;
- Absence of an upward draft in your chimney;
- Excess moisture found on windows, walls, or other cold surfaces.
- Excessive rusting on flue pipes, other pipe connections, or appliance jacks;
- Orange or yellow flames (should be blue) in your combustion appliances;
- Smokey smells — don't assume your fire alarm works;
- Fallen soot in the fireplace;



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- Small amount of water leaking from the base of the chimney vent or flue pipe;
- Damaged or discolored bricks at the top of your chimney; and
- Rust on the portion of the vent pipe visible from the outside.

Never use a barbeque grill or portable gas generator indoors. Never heat your home using an oven designed for cooking.

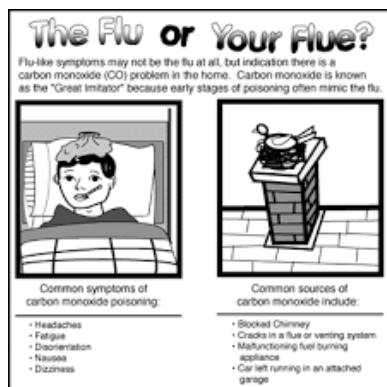
2. Know the symptoms of CO poisoning.

The health effects of breathing in CO depend on the concentration of CO in the air, the duration of exposure, and the health status of the exposed person. For most people, the first signs of exposure to low concentrations of CO include mild headache and breathlessness with moderate exercise. People with heart disease are more likely to be affected by CO, even at low concentrations. Continued exposure can lead to flu-like symptoms including more severe headaches, dizziness, tiredness, and nausea that may progress to confusion, irritability, and impaired judgment, memory and coordination. CO is called the "silent killer" because if the early signs are ignored, a person may lose consciousness and be unable to escape to safety. Under certain conditions, lethal concentrations of CO have occurred within 10 minutes in the confines of a closed garage with a car engine running inside or when a portable generator is used in or near a house.



3. How can I tell the difference between CO poisoning and the flu?

It could be CO poisoning if:



- You feel better when you are away from your home;
- Several people in the home get sick at the same time (the flu is usually passed from person to person);
- The family members who are most affected spend the most time in the home;
- Symptoms occur or get worse shortly after turning on a fuel-burning device (furnace, oven, fireplace) or running a vehicle in attached garage;

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- Indoor pets also appear ill (pets may experience symptoms first);
- You don't have a fever or generalized aching and swollen lymph nodes typical with a cold or virus or flu; or
- Symptoms appear at the same time as signs of inappropriate ventilation, maintenance, or operation of fuel-burning devices.

Never use a barbecue grill or portable gas generator indoors. Never heat your home using an oven designed for cooking.

3. Install and maintain CO alarms in your home.



Colorado State Law requires that homes have at least one (1) operational CO alarm within 10 feet of every room legally used for sleeping. All CO alarms should be certified by a nationally recognized testing laboratory to conform to the latest Underwriters Laboratory (UL) Standards. Follow the manufacturer's instructions for placement of your CO alarm and also note the suggested replacement date.

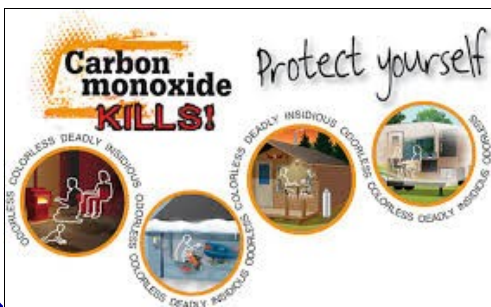


Can I experience CO poisoning from tobacco smoke?

Tobacco smoke, also known as "environmental tobacco smoke," contains CO in addition to many other hazardous chemicals and particles. Concentrations of CO in second hand smoke are too low to cause immediate poisoning, but breathing second-hand smoke for a long time can adversely affect the health of those exposed to it.

Are some people at greater risk of CO poisoning than others?

Yes, some people are at greater risk of CO poisoning. People at greater risk include individuals with:



- Respiratory conditions (such as asthma and emphysema);
- Cardiovascular disease;
- Anemia (such as sickle cell anemia);
- Individuals engaging in strenuous physical activity; and
- The elderly, children and fetuses.

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Can CO be a problem during the summer?

Yes. Although CO problems are more common during the heating season, vehicles including boats and some other fuel burning devices such as non-electric heaters for camping and fishing are used year-round and can be sources of CO during recreational activities.

CO poisoning has resulted from the use of fuel-burning devices during power outages. Portable generators are capable of producing carbon monoxide levels that are several hundred times the levels emitted by a modern car exhaust and can kill people in a very short time.

As recommended by CDC, portable generators should be placed at a minimum of 25 feet away from and down wind of a house. Be sure that there are no vents or openings, including window air conditioners, near the generator that would allow exhaust to enter into your home.



Where else could I experience CO poisoning?

Anytime you are near a fuel-burning device, there is a risk of CO exposure. Because vehicles are a common source of CO problems, it is recommended that you not run or idle your vehicle in an attached garage. Instead, back your vehicle out right away. It is also recommended that you check that your vehicle's exhaust pipe is not blocked, for example, by snow during the winter.



Fatalities due to CO inhalation have also occurred from boat motors. Be sure to follow manufacturer's guidelines and warn children about potential dangers near parts of the boat where exhaust concentrations could be high.

Dangerous concentrations of CO may also be produced by burning fossil-fuel appliances, such as gas stoves or charcoal grills in any

enclosed space including campers, tents, and ice fishing houses.

Finally, inhalation of paint removers containing methylene chloride can also result in carbon monoxide poisoning. Be sure to follow directions and use products containing methylene chloride and other chemicals in well-ventilated areas.

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Camping and Carbon Monoxide Poisoning

Colorado has a lot of the “great outdoors” — hiking, boating, fishing, hunting and more. With so much to do and explore, it’s no wonder that camping is a favorite pastime for many Colorado residents. When you are outside, you need to protect yourself and your family from the dangers of carbon monoxide. Carbon monoxide is found in the exhaust of generators, grills and camp stoves, lanterns and other common camping equipment.

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As recommended by CDC, portable generators should be placed at a minimum of 25 feet away from and down wind of a house. Be sure that there are no vents or openings, including window air conditioners, near the generator that would allow exhaust to enter into your home.



To protect yourself:

- DO NOT ride in covered pickup truck beds (campers, canopies). The exhaust can be drawn in as air moves around the vehicle.
- DO NOT sleep in a tent or trailer with a gas or kerosene-burning space heater unless it is permanently installed and properly vented.
- DO NOT ever cook or heat with a gas or charcoal grill or camp stove inside a tent or trailer — even if the windows and doors are open.
- DO NOT use a generator too close to your campsite or others’ sites. Keep it far from windows, doors, tents and air intakes on campers. Use an extra long extension cord to power the items you wish to use.
- BE AWARE that alcohol increases the effects of carbon monoxide.

