

## Preventing Carbon Monoxide Problems

### Quick Facts...

- More than 500 Americans die every year from carbon monoxide (CO) poisoning.
- Carbon monoxide is produced when fuel such as gas, oil, kerosene, wood or charcoal is burned.
- A properly functioning burner has efficient combustion and produces little CO. But if burner is not working properly or used incorrectly, dangerous levels of CO can collect in an enclosed space without any visible warning signs.
- You cannot see or smell carbon monoxide (CO).
- If you experience symptoms of CO poisoning (headache, fatigue, shortness of breath, nausea, dizziness, vomiting, disorientation), get fresh air immediately and go to an emergency room.
- Prevention is the key to protecting you and your family: Make sure equipment and CO alarms are working properly!

### Common Sources of CO in Homes:

- Blocked chimneys, rusted heat exchangers and broken chimney connector pipes (flues) that prevent combustion gases from being exhausted.
- An idling car, lawnmower or generator engine operating in the garage.
- Backdrafting when ventilation equipment, such as a range-top vent fan, used in a tightly sealed home reverses air flow in chimneys and flues. An operating fireplace also can interact with flue dynamics of other heating appliances and backdrafting may result.
- Unvented, fuel-burning space heaters (especially if malfunctioning).
- Indoor use of a charcoal barbecue grill.
- Gas stoves and ranges can become a problem with prolonged, improper operation. Never use these appliances to heat the home. Flame color does not necessarily indicate CO production. However, a change in the gas flame's color can indicate a CO problem. If a blue flame becomes yellow, CO often is increased.
- Smaller appliances designed to be used indoors without a flue, such as supplemental or decorative heaters and unvented gas fireplaces. Never use these appliances for more than four hours at a time.

### Safety Tips

When operating unvented combustion appliances, such as portable space heaters and stoves, follow safe practices:

- Observe fire safety rules.
- Make sure burner is properly adjusted and there is good ventilation.
- Never use space heaters in a closed room. Keep doors open throughout the house, and open a window for fresh air.
- Never use outdoor appliances such as barbecue grills or construction heaters indoors.
- Do not use appliances such as ovens and clothes dryers to heat the house.
- Inspect heating equipment.
- To reduce the chances of backdrafting in furnaces, fireplaces and similar equipment, make sure flues and chimneys are not blocked.
- Inspect metal flues for rust. In furnaces, check the heat exchanger for rust and cracks. Soot also is a sign of combustion leakage.
- When using exhaust fans, open a nearby window or door to provide replacement air.

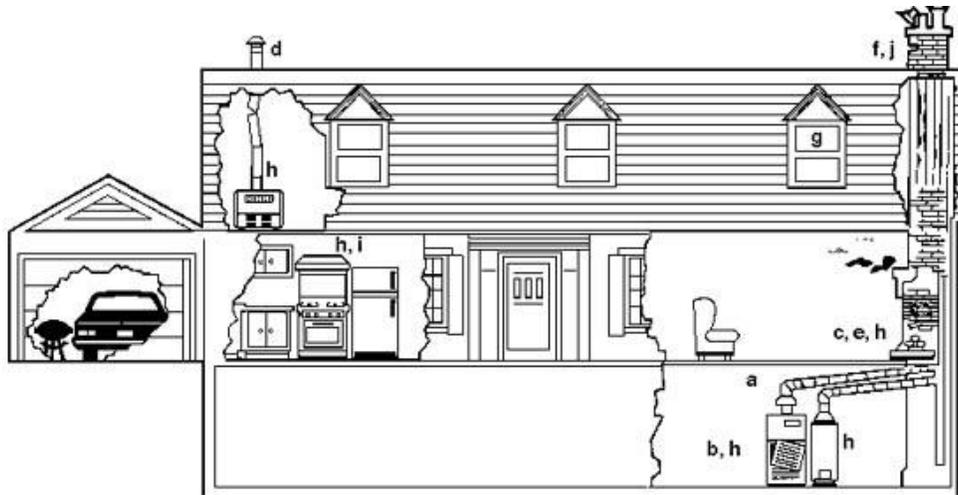


Figure 1: Sources of and clues to a possible carbon monoxide problem.

**CO clues you can see:**

- a. Rusting or water streaking on vent/chimney.
- b. Loose or missing furnace panel.
- c. Sooting.
- d. Loose or disconnected vent/chimney connections.
- e. Debris or soot falling from chimney, fireplace or appliance.
- f. Loose masonry on chimney.
- g. Moisture inside of windows.

**CO clues you cannot see:**

- h. Internal appliance damage or malfunctioning components.
- i. Improper burner adjustment.
- j. Hidden blockage or damage in chimney.

Only a trained service technician can detect hidden problems and correct these conditions!

**Warnings:**

- \* Never leave a car running in a garage, even with the garage door open.
- \* Never burn charcoal in houses, tents, vehicles or garages.
- \* Never install or service combustion appliances without proper knowledge, skills and tools.
- \* Never use a gas range, oven or dryer for heating.
- \* Never operate unvented gas-burning appliances in a closed room or in a room where you are sleeping.

*Adapted from "The Senseless Killer," U.S. Consumer Product Safety Commission, Washington, D.C.*

**CO Poisoning Symptoms**

The initial symptoms of CO poisoning are similar to the flu, but without the fever. They include:

- headache
- fatigue
- shortness of breath
- nausea
- dizziness
- vomiting

- disorientation
- loss of consciousness

In more technical terms, CO bonds tightly to the hemoglobin in red blood cells, preventing them from carrying oxygen throughout the body. If you have any of these symptoms and if you feel better when you go outside your home and the symptoms reappear when you go back inside, you may have CO poisoning.

**If you experience symptoms that you think could be from CO poisoning, get fresh air immediately. Open doors and windows, turn off combustion appliances, and leave the house. Go to an emergency room and tell the physician you suspect CO poisoning.**

If CO poisoning has occurred, it often can be diagnosed by a blood test done soon after exposure. Be prepared to answer the following questions for the doctor:

- Do your symptoms occur only in the house?
- Is anyone else in your household complaining of similar symptoms?
- Did everyone's symptoms appear about the same time?
- Are you using any fuel-burning appliances in the home?
- Has anyone inspected your appliances lately?
- Are you certain these appliances are properly working?

Because CO is a colorless, tasteless, and odorless gas that is quickly absorbed by the body and the symptoms often resemble other illnesses, it is often known as a "silent killer."

### **Prevention Is the Key**

- At the beginning of every heating season, have a trained professional check all your fuel-burning appliances: oil and gas furnaces, gas water heaters, gas ranges and ovens, gas dryers, gas or kerosene space heaters, fireplaces and wood stoves.
- Make certain that the flues and chimneys are connected, in good condition and not blocked.
- Whenever possible, choose appliances that vent fumes to the outside.
- Have them properly installed, and maintain them according to manufacturers' instructions.
- Read and follow all instructions that accompany any fuel-burning device.
- If you cannot avoid using an unvented gas or kerosene space heater, carefully follow the cautions that come with the device.
- Use the proper fuel and keep doors to the rest of the house open.
- Crack a window to ensure enough air for ventilation and proper fuel burning.

These problems could indicate improper appliance operation:

- Decreasing hot water supply.
- Furnace unable to heat house or runs constantly.
- Sooting, especially on appliances and vents.
- Unfamiliar or burning odor.
- Increased condensation inside windows.

Proper installation, operation and maintenance of combustion appliances in the home are most important in reducing the risk of CO poisoning. Some rules are:

- **Never** idle the car in a garage, even if the garage door is open. Fumes can build up very quickly in the garage and living area of your home.
- **Never** use a gas oven to heat your home, even for a short time.
- **Never** use a charcoal grill indoors, even in a fireplace.
- **Never** sleep in a room with an unvented gas or kerosene space heater.
- **Never** use any gasoline-powered engines (mowers, weed trimmers, snow blowers, chain saws, small engines or generators) in enclosed spaces.
- **Never** ignore symptoms, particularly if more than one person is feeling them. You could lose consciousness and die if you do nothing.

### **Install Carbon Monoxide Alarms**

In recent years, CO alarms have become widely available. When selecting a CO alarm, make sure it meets the stringent requirements of Underwriters Laboratories (UL) or International Approval Service (IAS). Modern CO alarms can provide warnings for even nonlethal levels of this dangerous pollutant. However, do not think of the alarm as the "be all, end all" to alert you to dangerous CO levels. The U.S. Consumer Product Safety Commission recommends having at least one CO alarm in every home, placed outside of the sleeping area. Homes with several sleeping areas require multiple alarms.

Look for an alarm with a long-term warranty and one that easily can be self-tested and reset to ensure proper functioning. Consumer organizations such as Consumer Reports occasionally evaluate these devices. Some general points to consider before buying a CO alarm:

- Some inexpensive alarms consist of a card with a spot (spot detectors) that changes color in the presence of CO. The absence of an audible signal does not meet UL or IAS requirements for alarms, so these devices do not provide adequate warning of CO.
- Some CO alarms have a sensor that must be replaced every year or so. The expense of this part should be a factor in purchase decisions.
- Battery-operated alarms are portable and will function during a power failure, which is when emergency heating might be used. Batteries must be replaced, although some alarms have long-life batteries that will last up to five years.
- Line-powered alarms (110 volt) require electrical outlets but do not need batteries. They will not function during a power failure. Some line-powered alarms have battery backups.
- Some alarms have digital readouts indicating CO levels. Alarms with memories can help document and correct CO problems.

If the CO detector alarm sounds:

- Make sure it is your CO detector and not your smoke detector.
- Check to see if any member of the household is experiencing symptoms of CO poisoning. If you suspect poisoning, get everyone out of the house immediately and seek medical attention. Tell the doctor that you suspect CO poisoning.
- If no one is feeling symptoms, ventilate the home with fresh air. Turn off all potential sources of CO: your oil or gas furnace, gas water heater, gas range and oven, gas dryer, gas or kerosene space heater, and any vehicle or small engine.
- Have a qualified heating or plumbing technician inspect your chimneys and fuel-burning appliances to make sure they are operating correctly and that nothing is blocking the fumes from being vented out of the house.