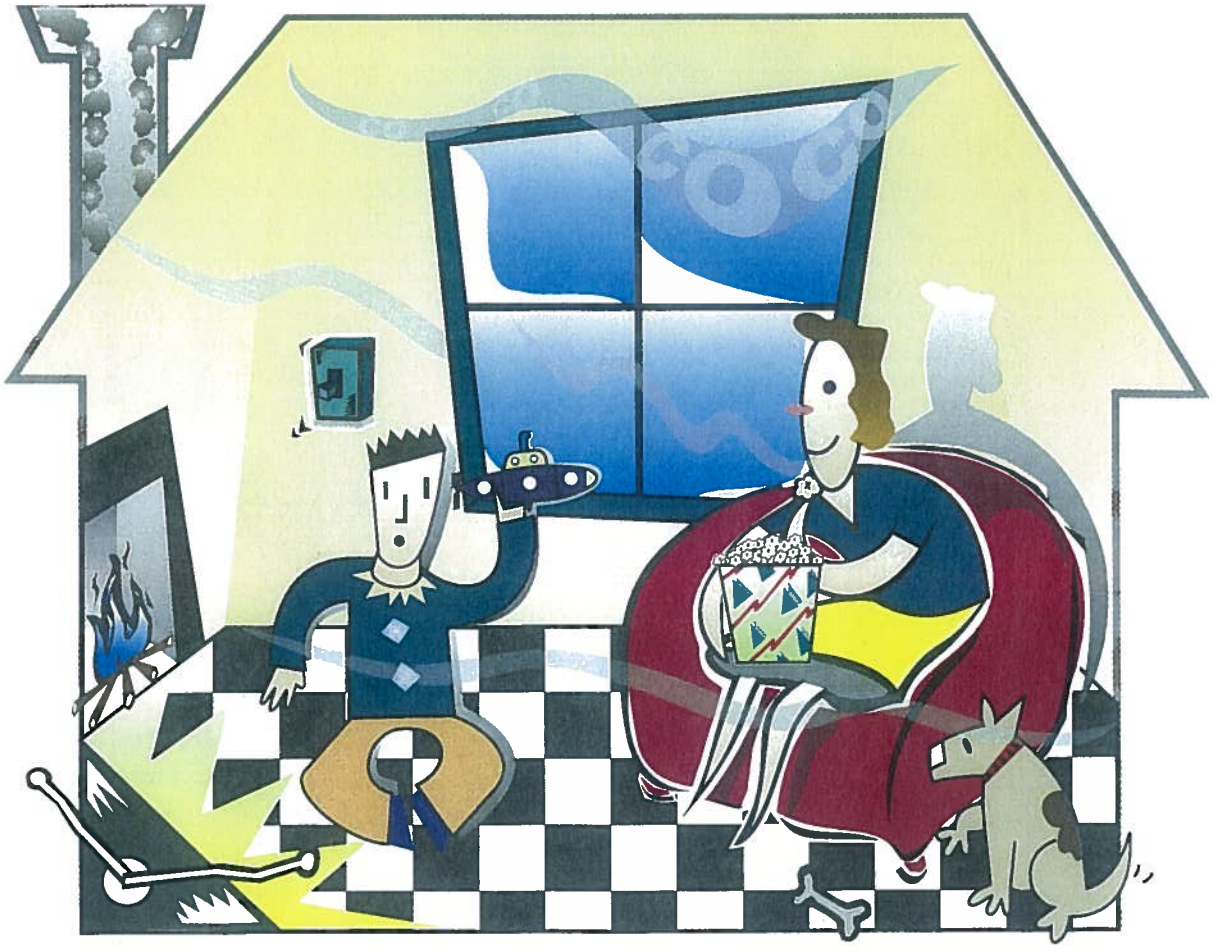
What are the symptoms of CO poisoning?

Exposure to CO can cause symptoms such as dizziness, headache, nausea, fatigue, burning eyes, vomiting or loss of muscle control. As there could be many other causes for these symptoms, including the flu, CO poisoning is sometimes difficult to diagnose.

The severity of the symptoms will vary depending upon the length and concentration of CO exposure, the person's general health and their level of physical activity. Prolonged exposure to high concentrations of CO can lead to unconsciousness and brain damage. In very severe cases, CO poisoning can be fatal.

Other warning signs include stale or stuffy air, excessive moisture on windows and walls, soot buildup around appliances and vents, a yellow flame in a natural gas appliance rather than blue, and a pilot light that keeps going out.



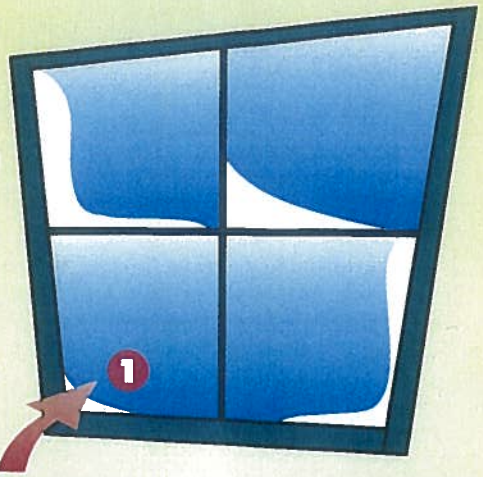
ATCO Gas

ALBERTA FIRE CHIEFS ASSOCIATION

This brochure produced in cooperation with the Alberta Fire Chiefs Association

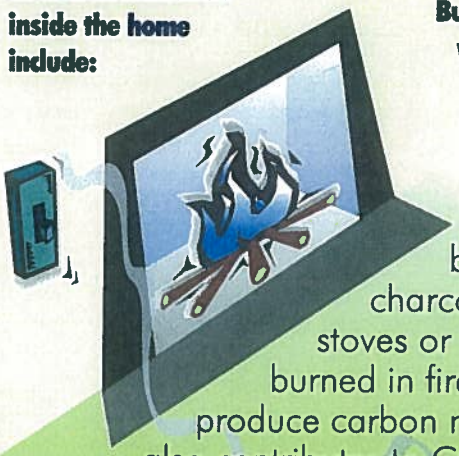
Where does CO come from?

Carbon monoxide comes from the incomplete combustion of common fuels including propane, heating oil, natural gas, gasoline, coal, wood, charcoal and kerosene; and from almost any other combustible material such as tobacco, fibres and paper.

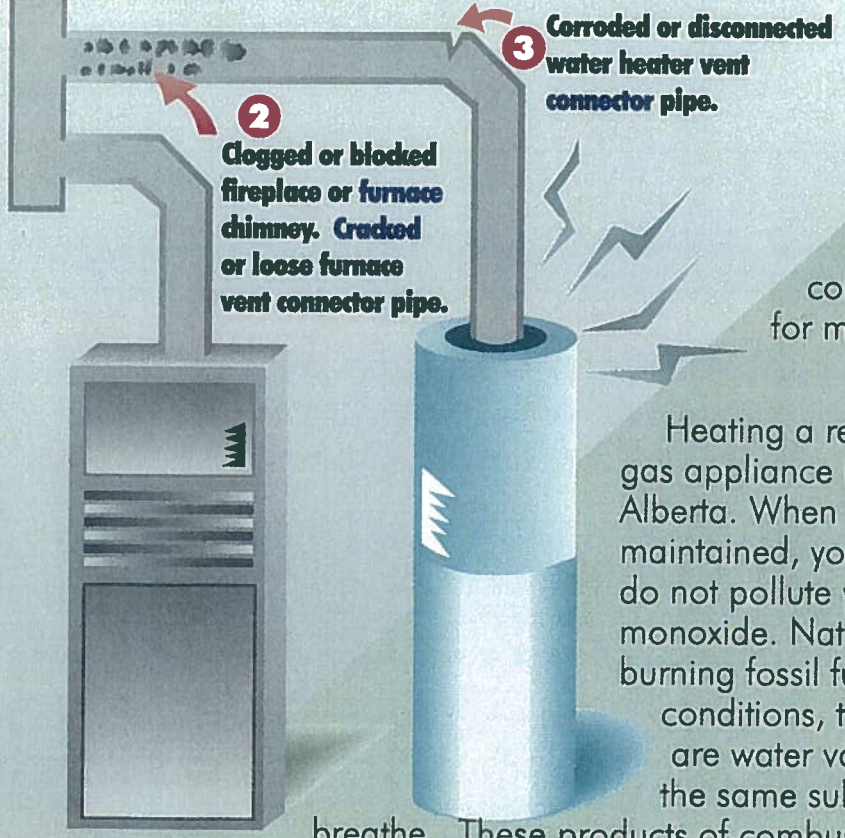


Burning a wood fire and not opening a window to provide replacement air BEFORE lighting the fire.

Common sources of carbon monoxide inside the home include:



Gasoline-powered vehicles, generators, lawn mowers, snow blowers, kerosene stoves, charcoal grills (BBQ'S), coal stoves or heaters, and wood burned in fireplaces or wood stoves produce carbon monoxide. Tobacco smoking also contributes to CO in the air you breathe, as do candles.



Smoke inhalation from fires is the most common form of CO poisoning. However, vehicle exhaust is the most common cause of CO exposure for most people.

Heating a residence with a non-vented gas appliance is prohibited by code in Alberta. When properly installed and maintained, your natural gas appliances do not pollute your home's air with carbon monoxide. Natural gas is the cleanest-burning fossil fuel. Under correct operating conditions, the combustion products are water vapor and carbon dioxide, the same substances we exhale when we breathe. These products of combustion are exhausted from natural gas furnaces, water heaters and appliances through a vent connector to a chimney to the outside of the house.

Correct operation of natural gas, or any fuel-burning appliance, requires two key conditions:

1. There must be an adequate supply of air for complete combustion.

2. There must be proper venting of the products of combustion to the outside through the vent connector and chimney.

Incomplete or faulty combustion (burning) of any fuel, including natural gas, can produce carbon monoxide. Incomplete combustion, combined with ineffective or faulty venting, can create a serious hazard in your home and to your health.

How do I prevent the risk of CO poisoning?

The first line of defense in preventing CO poisoning is the proper installation, use, maintenance and inspection of your fuel-burning appliances. Properly installed, adjusted and maintained fuel-burning appliances are safe and reliable.

If an additional measure of protection or assurance is desired, you may wish to install an Underwriters Laboratories of Canada (ULC) or Canadian Standards Association (CSA) approved CO detector.

However, a CO detector must always be considered your second line of defense. **It cannot take the place of the proper use and maintenance of your fuel-burning appliances.**

The Proper Use and Maintenance of

Fuel-Burning Appliances

What can I do to prevent CO in my home?

A few common sense precautions can greatly reduce the risk of CO poisoning in your home. An added benefit of proper maintenance and safety measures is you'll save energy - and money!

- **Never** operate cars or trucks in an enclosed area, such as a garage, even with the garage door open. If you must "warm up" your vehicle in winter, back it out onto your driveway or the street. Close the garage door as exhaust can still accumulate inside. Make sure you follow the manufacturer instructions if your car is equipped with an automatic car starter. **Never** leave children or pets alone in your vehicle while it is idling. Start lawn mowers and snow blowers outside, not in your garage.

- An open wood-burning fireplace with a roaring fire can use up to five to 10 times as much air in your home as your furnace. When using your wood-burning fireplace, always open a fresh air supply, like a nearby window, **before** lighting the fire. Be sure it's open enough to let adequate fresh air back into your home to keep your furnace working properly and expelling the products of combustion up the chimney.

  Don't close the window until the fire is completely out and you are able to close the damper. For greater assurance, you may wish to install a fresh air duct directly to the fireplace so it won't steal air from your home and furnace. Some fireplaces are manufactured with a fresh air supply as an integral part of the system. Be sure and check to determine whether or not your fireplace is already equipped with a fresh air intake.

- Keep all flue vents and chimneys clear of debris and other blockages, including insulation, leaves and bird nests. In the winter, make sure your chimney is free of frost and snow build-up. **Never** insulate or try to seal up a draft hood, wind cap or exhaust vent on any natural gas appliance (furnace, water heater, range, dryer, fireplace or space heater). **Never** block or plug a furnace combustion air intake or a fresh air vent.

- Keep the area around your gas appliances clean and unobstructed. Don't store anything close to your appliances that could restrict air circulation. If your furnace or water heater is enclosed or partitioned off due to a renovation, you may need an additional air supply.

- Repair rusted or pitted vent pipes leading from your furnace and water heater to the chimney immediately. Inspect the outside top of your metal chimney annually for corrosion, rusting or deterioration.

- Ensure the panels and grills on your furnace are kept in place and that the fan compartment door is on and secure at all times.

- **Never** use a charcoal barbecue grill, portable gas grill or similar equipment inside a home, tent, trailer, garage or other enclosed area.

- **Never** use a gas range, oven, clothes dryer or unvented space heater to heat your home. Heating a residence with a non-vented gas appliance is prohibited by code in Alberta.

- **Never** run exhaust fans, power attic vents or a central vacuum system for prolonged periods. Exhaust fans, much like a roaring wood-burning fire, can create a negative air pressure in your home if it does not have a proper fresh air supply. Dryers also exhaust a hugh amount of air, as do central vacuum systems. The new national building code requires a primary exhaust fan that comes interlocked with a ventilation air intake fan. Only this system is designed to run for prolonged periods of time.

- Installation, repair or adjustment of fuel-burning appliances are jobs for an experienced heating contractor or qualified technician. If you are a "do-it-yourselfer", you may need a building permit before beginning the job, and an inspection of your work by the local municipality after the job is complete. Some home handy-people have unknowingly created dangerous situations for themselves and their families or tenants. The inspector will give you peace of mind by certifying your job is done correctly, or by explaining how to correct any mistakes you have made.

- Regular maintenance of your space and water heating appliances is essential to keep them working properly and safely. Have your equipment inspected annually by a qualified technician. ATCO Gas will inspect all natural gas burning appliances and make recommend-ations. You may contact a qualified heating contractor or service technician to repair or clean your natural gas appliances.

- Between inspections, do a visual check of your appliances to look for signs of problems such as soot or water collecting near a burner or vent, and to ensure filters are clean and belts are not cracked or worn.

- Check the flame on your natural gas appliances regularly. Appliances that use natural gas should show a clear blue flame. If it is yellow, this is a sign that the fuel isn't burning completely and could be producing CO. If this occurs, or if your pilot light keeps going out, turn the appliance off and call ATCO Gas or a qualified heating contractor or technician to check your appliance.

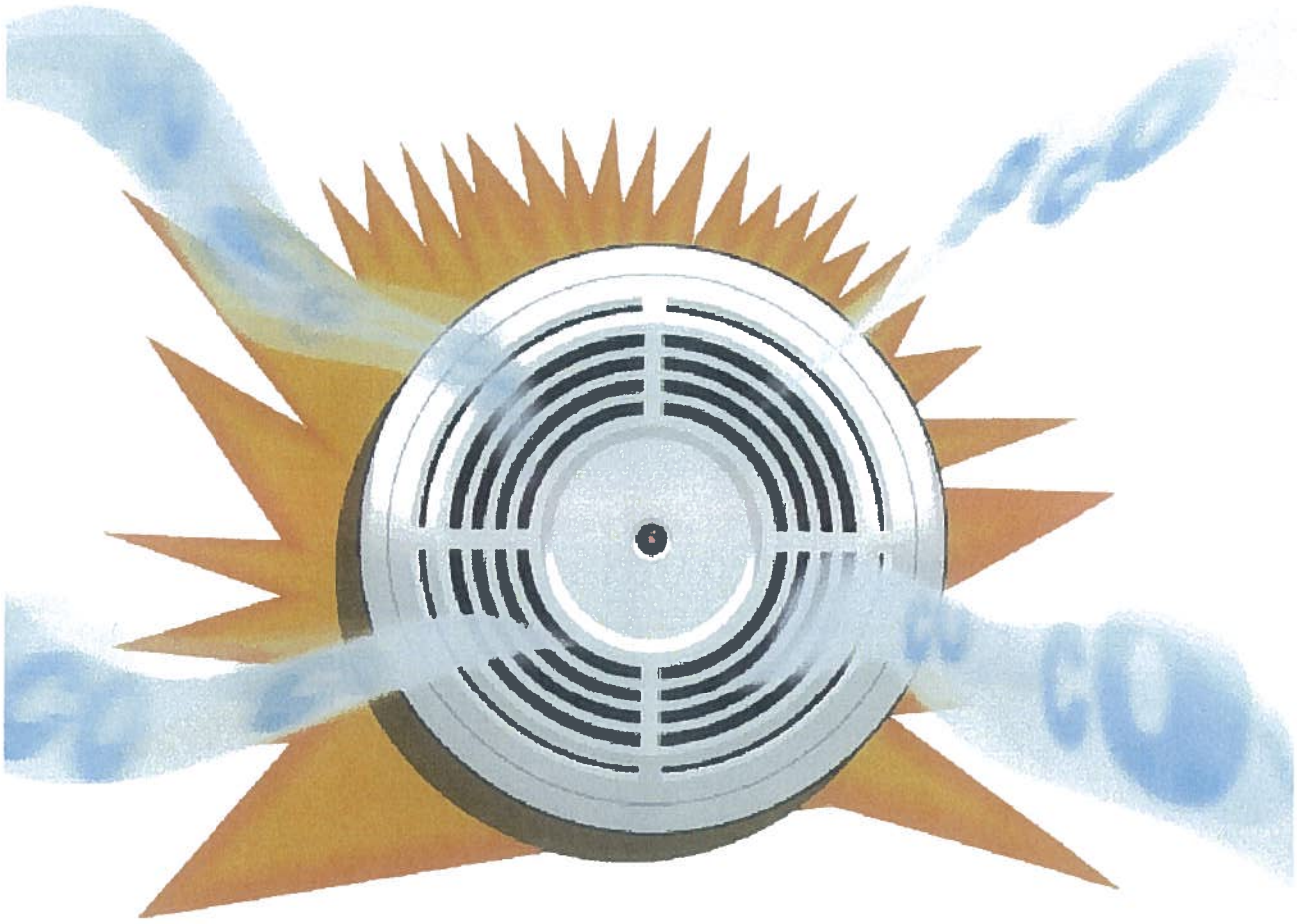
Energy-Efficient and Weatherized Homes

Modern, energy-efficient homes and older homes that have been caulked and weatherized allow smaller amounts of cold fresh air into the home and reduce heat loss.

These conservation methods save energy and money and are usually not the main cause of inadequate combustion or inadequate ventilation. Fresh air also enters a home through normal activities such as opening outside doors to enter and exit.

But if your home is tightly caulked and weatherized and does not have much fresh air circulation, you may want to consider installing a fresh air vent into the return air duct or a heat recovery ventilator to ensure your home receives adequate fresh air. A combustion air duct may also be needed to ensure the appliance has enough air for burning and proper venting.

Carbon Monoxide Detectors



Should I buy a carbon monoxide detector?

Again, the first step to take to prevent a CO problem is to use and maintain your fuel-burning appliances properly and have a qualified technician inspect your appliances annually. Between these inspections, you should do visual checks on a regular basis, looking for indications of a problem such as soot collecting near a vent or appliance, a yellow flame, or rusted holes in the vent connectors of the appliances.

However, if an additional measure of security and protection is desired, you may want to purchase a CO detector, which should be certified to the national Underwriters Laboratories of Canada (ULC) or Canadian Standards Association (CSA) standard for CO detectors.

Remember, a CO detector is your second line of defense. It can never be substituted for the safe use of vehicles and appliances, an annual inspection of your appliances by a qualified technician, and ensuring a convenient fresh air supply exists when using a wood-burning fireplace BEFORE LIGHTING THE FIRE. A good example of a fresh air supply is a nearby open window.

What is a CO detector and how does it work?

It is very important to remember that, just like a smoke detector, a battery-powered CO detector must be regularly maintained according to manufacturer instructions.

There are a wide variety of CO detectors available. Although various models work in different ways, in general they are all designed to monitor the air for levels of CO, much like a smoke detector monitors the air for smoke. Some CO detectors are more sensitive than others and will alarm when they detect lower levels of CO.

Three types of home detectors are currently in the marketplace. "Biomimetic" detectors use a semi-permeable gel or "gel cell" that changes colour when exposed to CO. The gel absorbs CO at the same rate as the hemoglobin in human blood, getting darker as it absorbs higher levels. When a light sensor in the detector recognizes the colour change, the alarm goes off. With this technology, the battery and the sensor come in a package that must be replaced every two years.

The second type of detector uses metal oxide as a semiconductor, which changes its level of conductivity when exposed to CO. An electronic circuit senses the change in current through the semiconductor and sets off the alarm.

The third type of detector uses an electrochemical sensor, similar to the technology used in industrial applications.

All home detectors either use a battery system or can be plugged into a regular AC house receptacle.

ATCO Gas and the Fire Department do not recommend one CO detector over another. We do recommend that you maintain and use your appliances properly. However, if you want to install a CO detector for an extra feeling of security, make sure it is approved by a certified testing agency, preferably ULC or CSA. You should also thoroughly investigate all options to ensure the CO detector you choose meets your needs.

If you purchase a CO detector, **follow the manufacturer's instructions carefully and place it in the location recommended.** Once installed, you should test the alarm to make sure it's working properly and be aware of the replacement requirements of the sensing unit.

What Should I Do ?

Make the Right Call!

If I suspect a CO problem?

- If someone in your home is **experiencing the symptoms of CO poisoning**, have everyone leave the premises promptly and **get medical help immediately** by calling **911 or the Fire Department** from a neighbour's house. This is particularly true if everyone in the house is suffering from the same symptoms at the same time, or if the symptoms improve when you leave your home.

- If you suspect a CO problem, but **no one is ill, evaluate the situation.** Go outside into the fresh air. Then return to your home, open the doors and windows to allow fresh air in and call **ATCO Gas** or another qualified technician to inspect your appliances and check your home for other possible sources of CO.

If my CO detector alarms?

- If your **CO detector alarms**, and someone in your home is **experiencing the symptoms of CO poisoning**, have everyone leave the premises promptly and **get medical help immediately** by calling **911 or the Fire Department** from a neighbour's house. Again, this is particularly true if everyone is experiencing the same symptoms at the same time.

- If your **CO detector alarms, but no one feels ill, stay calm and evaluate the situation. Take steps immediately to determine the reason for the alarm. Here are some situations that may occur that may cause your detector to alarm:**

If no one is ill, and your CO detector has alarmed as a result of one of these situations, use the manufacturer's instructions to reset the device.

1. If the CO detector accumulates very low levels of CO over a long period of time and does not clear itself.

2. If the CO detector is located near chemicals, cleaning products, cigarette smoke or candles.

3. If exhaust fumes from a vehicle idling in your garage are entering your home through a connecting door or window.

4. If exhaust fumes from a vehicle idling outside are entering your home through a door, window or fresh air intake.

5. If the CO detector has been exposed to prolonged humidity, such as being located near a bathroom door.

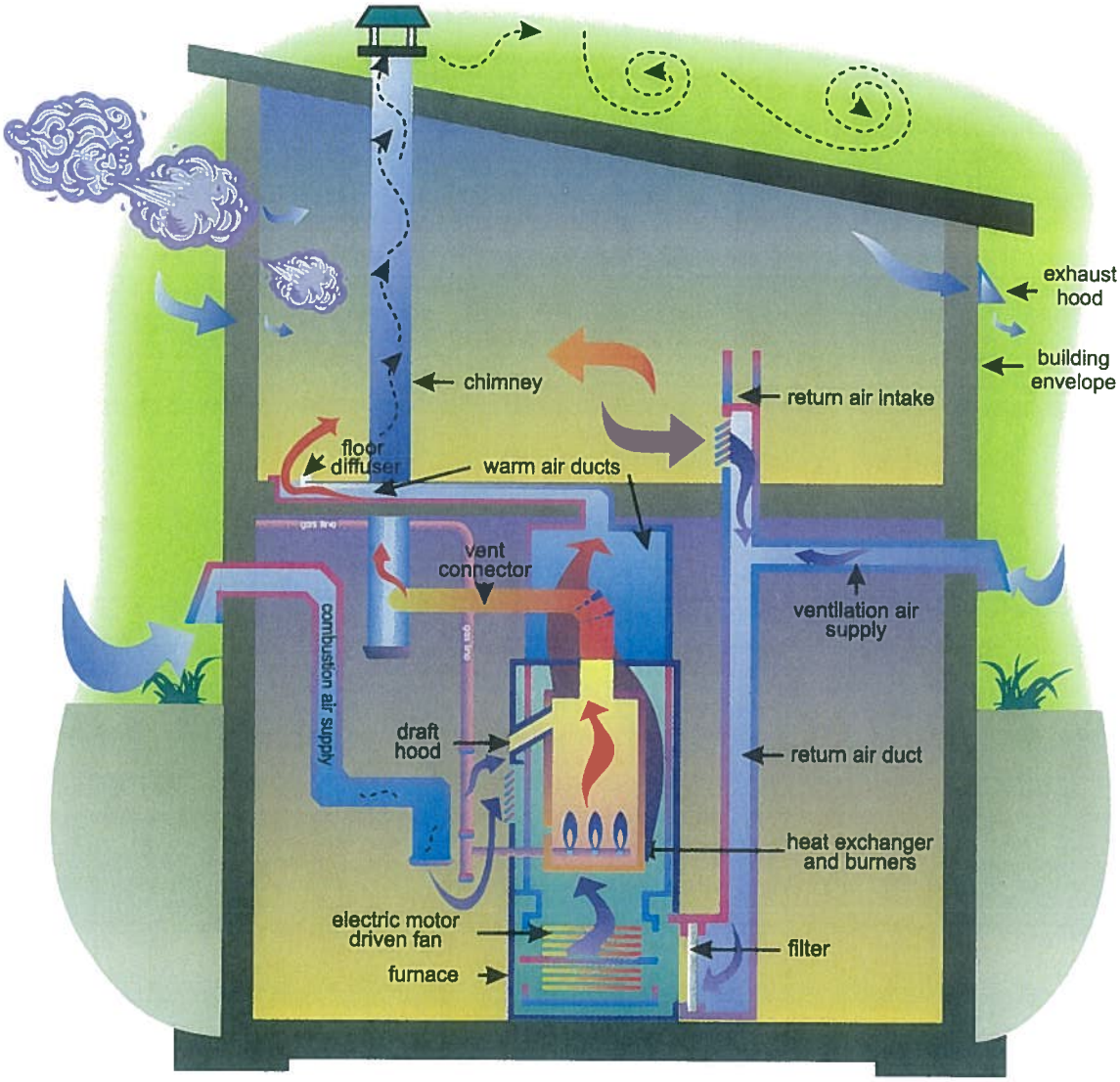
6. During winter, when atmospheric weather inversions cause CO produced from vehicle exhaust to build up and be held close to the ground rather than dispersing into the atmosphere. This is particularly common in areas close to mountains, or in cities where vehicle exhaust is heavy.

- **If no one is ill, but you can't explain why your CO detector alarmed,** first go outside into the fresh air. Then return to your home, open the doors and windows to allow fresh air in and call **ATCO Gas** or another qualified technician to inspect your appliances and check for other possible sources of CO.

What levels of CO are harmful?

The harmful effects of carbon monoxide exposure depend on the concentration of CO in the air and the length of time of exposure. Age, sex, health and activity all have a bearing on symptoms experienced.

Air flow in your home



Air must flow through your home to keep it safe, healthy and comfortable. Your home is a system and to work most efficiently, a balance between air flowing in and air flowing out is needed. For more information on air flow in the home, look for the ATCO Gas **A balancing act: your home as a system** brochure.

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