National Carbon Monoxide Awareness Association

What is carbon monoxide?

Carbon monoxide (CO) is a colorless, odorless, and tasteless non-irritating gas that is imperceptible to human senses. CO poisoning is a leading cause of poisoning in the United States (US) and accounts for more than 20,000 ER visits annually.

Learn More: www.ncoaa.us.

HOW IS CO PRODUCED?

CO is found in fumes produced any time you burn fuel, such as in cars or trucks, small engines, stoves, lanterns, grills, fireplaces, gas ranges, or furnaces. CO can build up and poison people and animals who breathe it.

WHO CAN GET CO POISONING?

Everyone is at risk for CO poisoning. Infants, the elderly, people with chronic heart disease, anemia, or breathing problems are more likely to get sick from CO. Each year, more than 400 Americans die from unintentional CO poisoning not linked to fires, more than 100,000 visit the emergency room, and more than 14,000 are hospitalized.

SOURCES OF CO

- Unvented kerosene and gas space heaters
- Leaking chimneys and furnaces
- Back-drafting from furnaces, gas water heaters, wood stoves, and fireplaces
- Gas stoves
- Generators and other gasoline powered equipment
- Automobile exhaust from attached garages
- Tobacco smoke.

HEALTH EFFECTS

At low concentrations, fatigue in healthy people and chest pain in people with heart disease.

At higher concentrations, impaired vision and coordination; headaches; dizziness; confusion; nausea. Can cause flu-like symptoms that clear up after leaving home.

Fatal at very high concentrations.

AVOIDING CO POISONING

- Install a CO detector near sleeping areas, on indoor walls shared with a garage, and near combustion equipment in your home
- Never leave a car running in your garage
- Operate generators at least 20 feet away from your home
- Carry a portable CO detector that goes all the down to zero
- Make sure all appliances work and are fully vented
- Use appliances and stoves appropriately or use electric appliances and stoves

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Health Effects of Carbon Monoxide (CO)

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ACUTE POISONING

Acute poisoning occurs when someone is exposed to high levels of carbon monoxide. It may produce immediate symptoms. Immediate medical attention is required by calling 911 or visiting an emergency room.

CHRONIC POISONING

Chronic poisoning occurs over time at low levels of exposure to carbon monoxide. While the dangers of acute CO exposure have been known for centuries, it has more recently become apparent that chronic low-level CO exposure is also a major public health concern. Chronic low-level CO exposure has been linked to heart failure, stroke, cognitive and memory impairments, sensory-motor deficits, emotional changes, congenital defects, and low birth weight, among others.

HOW MUCH CO IS SAFE?

There is no safe level of CO, as even low levels can lead to serious health issues.

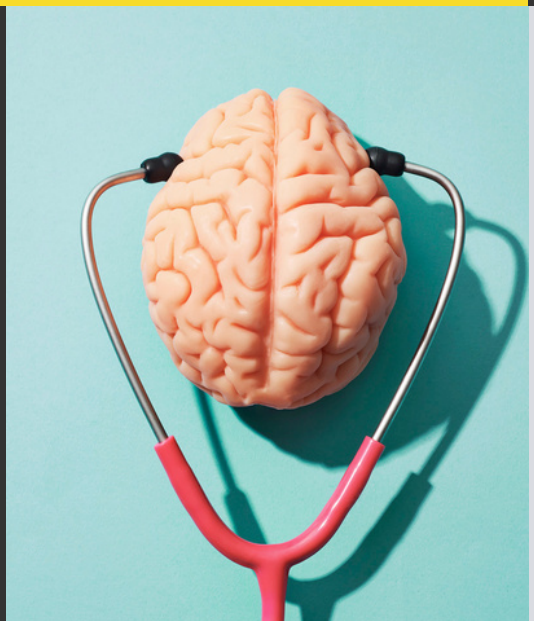
The WHO states that the exposure limit associated with health issues is 4 parts per million (ppm) over a period of 24 hours.

The EPA recommends no more than 9 ppm over 8 hours or 35 ppm over 1 hour.

Average levels in homes without gas stoves vary from 0.5 to 5 ppm. Levels near properly adjusted gas stoves are often 5 to 15 ppm and those near poorly adjusted stoves may be 30 ppm or higher.

BRAIN DAMAGE

Another well-documented, yet poorly understood long-term health is delayed neuropsychological sequelae (DNS). DNS is the sudden appearance of neuropsychological abnormalities after a period of recovery from initial CO symptoms. The typical features of DNS may include amnesia, fecal/urinary incontinence, gait and/or speech disturbances, anxiety, depression, and Parkinsonism.



DIAGNOSIS

CO poisoning diagnosis is typically based on clinical symptoms and suspected or confirmed CO exposure. However, CO poisoning is often missed by doctors.

A blood test to measure carboxyhemoglobin (COHb) levels is often used to confirm CO poisoning. However, this test must be conducted within 4 hours of exposure.

Newer breath tests are now available but are not widely used.

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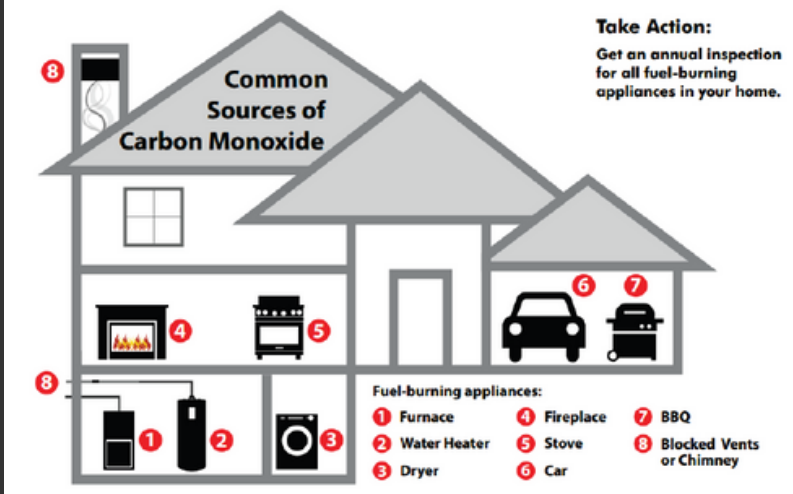
Carbon Monoxide in the Home

CO poisoning most frequently occurs at home. There are a number of potential sources of CO in the home.

The most common sources of CO poisoning at home are vehicles in garages, gas stoves, furnaces, water heaters, and fireplaces.

Learn More: www.ncoaa.us.

Carbon Monoxide Poisoning Prevention



CO ALARMS IN THE HOME

Install a CO detector near sleeping areas, on indoor walls shared with a garage, and near combustion equipment in your home.

CO alarms in the US are designed to alert you when the concentration of CO reaches 70 parts per million (ppm) over a period of time.

These devices are designed to save your life by alerting you to life-threatening levels of CO. They are not designed to prevent chronic, low-level CO poisoning.

NCOAA is advocating for changes to the alarm threshold to enable protection against low-level poisoning.

SOURCES OF CO

CO is produced whenever a material burns. Homes with fuel-burning appliances or attached garages are more likely to have CO problems.

Common sources of CO in our homes include fuel-burning appliances and devices such as:

- Clothes dryers
- Water heaters
- Furnaces or boilers
- Fireplaces, both gas and wood burning
- Gas stoves and ovens
- Motor vehicles
- Grills, generators, power tools, lawn equipment
- Wood stoves
- Tobacco smoke

PORTABLE DETECTORS

Because home CO alarms do not alert you to the presence of low-level CO poisoning, NCOAA recommends purchasing a portable detector that goes all the way down to zero ppm.

You can keep your detector in your home or take it with you on the boat, in your RV, when doing yardwork, and any time CO may be present.

STATE CO ALARM LAWS

Requiring CO alarms in homes, commercial buildings, schools, daycares, and other buildings is typically governed by state laws. However, when state law does not exist or may be lacking, local municipalities sometimes pass laws at the local level.

Not every state requires CO alarms in homes, but regardless of whether your state requires an alarm, you should have one to protect your family from CO poisoning.

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Carbon Monoxide Alarms

It is important to place as many carbon monoxide (CO) alarms as needed in the right places throughout your home. You may need multiple alarms depending on the size and layout of your home in order to be properly protected.

Learn More: www.ncoaa.us.

WHERE TO PLACE A CO ALARM

The International Association of Fire Chiefs recommends a carbon monoxide alarm on every floor of your home, including the basement.

An alarm should be located within 10 feet of each bedroom door, and there should be one near or over any attached garage.

If you are using a combination Smoke and CO alarm, make sure to place the alarm high up on the wall or on the ceiling. It should also be installed at least 10 feet away from a cooking appliance to minimize false smoke alarms when cooking.

A WORD ABOUT BATTERIES

Did you know about 50% of CO alarms in homes don't work because of dead batteries?

Newer carbon monoxide alarms now come with the option of using a 10-year lithium ion battery. The National Carbon Monoxide Awareness Association (NCOAA) recommends purchasing an alarm with a 10-year lithium ion battery.

This will save you time and money because you will not need to frequently replace your battery, meaning that you'll be better protected because there's less of a chance of the battery being dead.

If you purchase home alarms with traditional batteries, make sure to check each month that the battery is still working. Replace batteries when they die.

LOW LEVEL ALARMS

Brands like Defender and Forensic Detectors now make low-level home carbon monoxide alarms. We recommend purchasing a low-level detector or a portable personal detector to keep in your home so that you will be alerted when low levels of carbon monoxide are detected.

UL 2034 STANDARDS

Most carbon monoxide alarms are built to UL 2034 standards. This standard prevents alarms from alerting until CO is high enough to kill a healthy adult at 70 ppm. At that level, it could take 1-4 hours for your alarm to alert you to this danger.

This standard dictates that CO alarms are designed to save lives by notifying occupants when near-fatal concentrations of CO are detected. However, they do not alert you to harmful low levels of CO that can cause illness or injury.