



# Carbon Monoxide Safety



## Key Facts

- Annually, there are over 20,000 carbon monoxide (CO)-related emergency department visits reported in the U.S.
- From 1999 to 2004, more than 20 children ages 14 and under died from unintentional, non-fire-related CO poisoning annually.
- Of all age groups, children ages 4 and under have the highest rates of emergency department visits for CO-related incidents.
- In 2009, poison control centers had 1,674 exposure cases of CO exposure among children ages 5 and under and 1,069 exposure cases among children ages 6 to 12.
- A 2005 survey found that less than 30 percent of households had a CO detector.

## Where, When and How

- CO is a colorless and odorless gas that is created when burning a fuel, such as gasoline, propane, natural gas, oil, wood and charcoal.
- Items such as generators, portable heaters or improperly ventilated stoves and fireplaces, as well as running cars, can lead to a build up of CO gas in enclosed or semi-enclosed spaces.
- CO causes illness by decreasing the amount of oxygen present in a person's body.
- In 2005, U.S. fire departments responded to an average of seven non-fire CO-related incidents per hour.
- A majority of unintentional, non-fire-related CO exposures occur in the home.
- CO-related hospitalization and CO-related emergency department visits are highest in the winter months.
- Rates of hospitalizations and emergency department visits are highest in the northeast and Midwest regions likely due to the severe winter season.

## Who

- Because of their high metabolic rates and high tissue oxygen demands, children are biologically at increased risk of CO poisoning when exposed to CO.
- Minority, immigrant and non-English speaking populations have an increased risk of CO poisoning. This could be because of limited access to health care or lower socioeconomic status, potentially resulting in fewer CO alarms in homes and poorly maintained or unventilated heating and cooking appliances.

## Symptoms

- The most common symptoms include headache, dizziness, fatigue, nausea, vomiting and confusion.
- In severe cases, the person may lose consciousness or even die.
- CO poisoning can often be mistaken for other illnesses, such as the flu or food poisoning. If there is a CO leak, more than one person in the house will often suffer symptoms at the same time.

## Prevention Strategies

- One study has found that audible electronic CO detectors could have prevented over 50 percent of CO-related deaths in the study area.
- A 1996 study found that homes with a CO detector had a lower concentration of CO than homes without a CO detector when investigated.
- A 1996 study found that among people exposed to CO, those that had a CO detector had fewer poisoning symptoms and were less likely to be transported to a health care facility than those without a CO detector.
- CO detectors were more common in Midwest homes, among families with an annual income over \$50,000 and in owner-occupied homes.

### To decrease the risk of CO poisoning the following strategies are recommended:

- Install a CO alarm inside your home at a central location outside every sleeping area.
- Place CO alarms at least 15 feet away from every fuel-burning appliance to reduce the number of nuisance alarms.
- Test alarms every month and replace them according to manufacturer's instructions.
- Make sure alarms can be heard, especially where individuals are sleeping, and be sure everyone in the family knows what to do if the alarm sounds.
- Have all gas, oil or coal burning appliances inspected by a technician every year to ensure they are working correctly and are properly ventilated.
- Never use a stove for heating.
- Never use a grill, generator or camping stove inside your home, garage or near a window.
- Never leave a car, SUV or motorcycle engine running inside a garage, even if the garage door is open.
- CO can accumulate anywhere in or around your boat; install a CO alarm on your motorboat.

### If your CO alarm goes off, follow these simple steps:

- Get everyone into fresh air immediately and call for help.
- If you're experiencing symptoms, call 911 for medical attention.
- If no one is experiencing symptoms, call a qualified professional to investigate possible CO buildup.

## Costs

- A nationwide surveillance system found that the total hospital charges averaged more than \$15,000 for individuals whose principal diagnosis was CO poisoning in 2005. This number does not include professional fees or other CO cases with a different principal diagnosis and therefore drastically underestimates the overall cost burden of CO-related hospitalizations.
- In the U.S., it is estimated that residential CO exposure-related morbidity costs approximately \$180 million annually.

## Laws and Regulations

- Thirty-five states and some local jurisdictions have passed legislation requiring the use of CO detectors in the home.
- Texas and Tennessee have enacted laws that require the installation of CO detectors in certain childcare facilities.
- There is a correlation between cities with CO alarm ordinances and lower death rates from CO.