



## Preventing Carbon Monoxide Poisoning

### Information for Older Adults and Their Caregivers

**D**o you know that carbon monoxide (CO) is the most common cause of poisoning death in the United States? Unintentional CO poisonings are responsible for about 500 deaths and 15,000 visits to emergency rooms annually. Older adults over 65 years of age are especially vulnerable to unintentional CO poisoning due to their high frequency of pre-existing medical conditions.<sup>1</sup> While CO alarms can save lives, fewer than one third of American homes have them installed.<sup>2</sup>

#### What Is Carbon Monoxide (CO)?

CO is an odorless, colorless gas that can cause illness and death. It is produced whenever any fuel such as natural gas, propane, gasoline, oil, kerosene, wood or charcoal is burned. Devices that produce CO include cars, boats, gasoline engines, stoves and heating systems. CO from these sources can build up in enclosed or semi-enclosed spaces. When people inhale CO, the toxic gas enters the bloodstream and blocks oxygen from being absorbed into the body, which can damage tissues and result in death.<sup>3</sup>

#### What Are the Symptoms of CO Poisoning?

For most people, the first signs of exposure to low concentrations of CO include mild headache and

Everyone is at risk of being poisoned by carbon monoxide exposure. Older adults with pre-existing conditions, such as chronic heart disease, anemia, or respiratory problems, are even more susceptible to the effects of this odorless, colorless gas.

breathlessness upon moderate exercise. Continued or acute exposure can lead to flu-like symptoms including more severe headaches, dizziness, tiredness, nausea, confusion, irritability, and impaired judgment, memory and coordination.<sup>4</sup> CO is called the “silent killer” because if these early signs are ignored, a person may lose consciousness and be unable to escape the danger.

## **You May Be Symptom Free and Still Exposed to Unsafe CO Levels**

Breathing low concentrations of CO may not result in obvious symptoms of CO poisoning, yet exposure to low levels of CO can cause long-term health damage, even after the CO source is removed. These health effects include long-term neurological damage such as learning and memory impairments, emotional and personality effects, and sensory and motor disorders.<sup>5</sup>

## **How to Tell the Difference between CO Poisoning and the Flu**

Since many of the symptoms of CO poisoning are similar to those of the flu, you may not think that CO poisoning could be the cause.

Symptoms could be the result of CO poisoning when:

- You feel better when you are away from your home.
- More than one person in the home gets sick at the same time (it usually takes several days for the flu to pass from person to person).
- 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 or running a vehicle in an attached garage.
- Indoor pets also appear ill, exhibiting symptoms such as drowsiness and lethargy (human flu viruses are not transmitted to pets).
- Generalized aching, low-grade fever, or swollen lymph nodes (these are typical of a cold or flu).<sup>12</sup>

## Who Is at Risk from CO Poisoning?

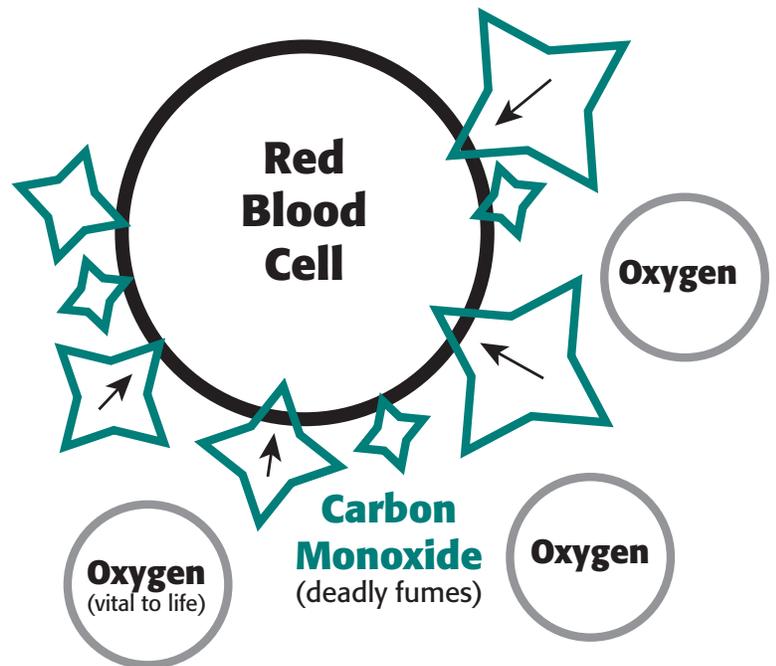
People of all ages are at risk for CO poisoning. Persons living with chronic heart disease, anemia, or respiratory problems are more susceptible to its effects.<sup>6</sup> Older adults more frequently have these pre-existing conditions, which lower their tolerance and increase the risk of a fatal exposure.<sup>7</sup> CO poisoning can also be highly dangerous for unborn children, greatly increasing the risk of fetal death and developmental disorders.<sup>8,9</sup>

## More Common among Minorities

A study conducted in Washington State among minority populations showed that Hispanic populations had a four times greater risk and black populations had a three times greater risk than white populations for CO poisoning. In addition, 67% of Hispanic populations and 40% of black populations became poisoned due to the indoor burning of charcoal briquettes.<sup>10</sup>

## If You Experience Symptoms You Think Could Be from CO Poisoning:

- Get fresh air immediately. Open doors and windows and turn off



stoves, ovens, heaters and similar appliances and leave the house.

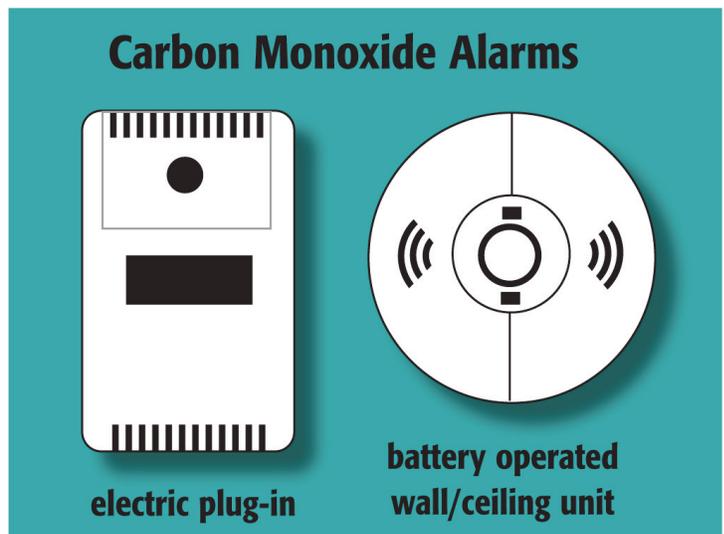
- Call a poison center immediately at 1-800-222-1222. The poison experts there will let you know if you need to seek further medical attention.<sup>14</sup>

## To Prevent CO Poisoning Remember I CAN B:

- **I**nstall CO alarms near sleeping areas.
- **C**heck heating systems and fuel-burning appliances annually.
- **A**void the use of non-vented combustion appliances.
- **N**ever burn fuels indoors except in devices such as stoves or furnaces that are made for safe use.
- **B**e Attentive to possible symptoms of CO poisoning.

## Other Tips for Preventing CO Poisoning:

- Keep gas appliances properly adjusted.
- Consider purchasing a vented space heater when replacing a non-vented one.
- Use proper fuel in kerosene space heaters.
- Install and use an exhaust fan vented to the outdoors over gas stoves.
- Open flues when using the fireplace.
- Choose properly-sized wood stoves that are certified to meet EPA emission standards. Ensure wood stove doors fit tightly.
- Have your heating system and chimney inspected and cleaned by a qualified technician annually.
- Make sure all interior fuel-burning appliances are in good condition and have proper ventilation.
- Never idle the car in the garage, even if the garage door is open to the outside.
- Use portable generators outside and far away from buildings. Never use portable generators on balconies or near doors, vents or windows. Never use portable generators near to where you sleep or your family sleeps.
- Never use a charcoal grill indoors, even in a fireplace.
- Propane heaters or heaters using other fuels placed in enclosed hunting and fishing shanties, should be vented to the outside.
- Never heat your home with a gas oven.



## CO Alarms

Half of all unintentional CO poisoning deaths could be prevented with the use of CO alarms. Alarms should be Underwriters Laboratories (UL) approved and are generally available at local hardware stores.<sup>11</sup> The cost is minimal and in view of the possibility that it may save the lives of you and your family it is a bargain. Install a CO alarm on every floor of your home and within hearing range of each sleeping area. Carefully follow man-

ufacturers' instructions for their placement, use, and maintenance. Unlike smoke alarms, CO alarms may expire after several years.

Don't let buying a CO alarm lull you into a false sense of security. CO alarms should only be considered a back-up for proper use and maintenance of your fuel-burning appliances. CO alarms are not designed for low-level CO monitoring and there have been questions about whether CO alarm standards are protective enough, especially for sensitive groups such as older adults.<sup>13</sup>

## **Aging Adults and Environmental Health Issues**

EPA's Aging Initiative is working to protect the health of older adults from environmental hazards through risk management and prevention strategies, education and research. For more information about EPA's Aging Initiative, visit [\*\*www.epa.gov/aging\*\*](http://www.epa.gov/aging)

Printed copies of this fact sheet can be ordered at:

[\*\*http://www.epa.gov/aging/resources/factsheets/order.htm\*\*](http://www.epa.gov/aging/resources/factsheets/order.htm)

## **Additional Resources**

### **Your Local Poison Center**

- 1-800-222-1222
- Internet: [www.aapcc.org](http://www.aapcc.org)

### **U.S. Environmental Protection Agency**

#### **Carbon Monoxide:**

<http://www.epa.gov/iaq/co.html>

### **CDC**

#### **Carbon Monoxide:**

<http://www.cdc.gov/co/>

### **Consumer Product Safety Commission**

#### **Home Heating Equipment Safety:**

[www.cpsc.gov/cpsc/pub/pubs/heatpubs.html](http://www.cpsc.gov/cpsc/pub/pubs/heatpubs.html)

#### **Carbon Monoxide Alarms:**

[www.cpsc.gov/cpsc/pub/prerel/prhtml01/01069.html](http://www.cpsc.gov/cpsc/pub/prerel/prhtml01/01069.html)

#### **Portable Generators:**

[www.cpsc.gov/cpsc/pub/pubs/portgen.html](http://www.cpsc.gov/cpsc/pub/pubs/portgen.html)

## Footnotes

1 Centers for Disease Control and Policy. Carbon Monoxide-Related Deaths – United States, 1999-2004. Morbidity and Mortality Weekly Report. December 21, 2007; 56(50):1309-12.

2 Home Safety Council. Unintentional Home Injury in the United States. State of Home Safety: 2004 Edition.  
[http://www.homesafetycouncil.org/state\\_of\\_home\\_safety/sohs\\_2004\\_p017.pdf](http://www.homesafetycouncil.org/state_of_home_safety/sohs_2004_p017.pdf).

3 (CDC), National Center for Environmental Health, "Carbon Monoxide Poisoning: Questions and Answers," July 2006.  
<http://www.cdc.gov/co/faqs.htm>

4 The U.S. Environmental Protection Agency (EPA), Indoor Environments Division (6607J) Office of Air and Radiation, "Protect Your Family and Yourself from Carbon Monoxide Poisoning," October 1996.  
<http://www.epa.gov/iaq/pubs/coftsht.html>

5 Delayed Neuropathology after Carbon Monoxide Poisoning Is Immune-Mediated, Stephen R. Thom, Veena M. Bhopale, Donald Fisher, Jie Zhang, Phyllis Gimotty and Robert E. Forster, Proceedings of the National Academy of Sciences of the United States of America, Vol. 101, No. 37 (Sep. 14, 2004), pp. 13660-13665. EPA. 2000. Air Quality Criteria for Carbon Monoxide. U.S.EPA, National Center for Environmental Assessment. June, 2000. EPA 600/P-99/001F.

6 Centers for Disease Control and Prevention (CDC), National Center for Environmental Health, "Carbon Monoxide Poisoning: Questions and Answers," July 2006. <http://www.cdc.gov/co/faqs.htm>

7 CPSC. 2004. Non-Fire Carbon Monoxide Deaths Associated with the Use of Consumer Products: 2001 Annual Estimates. U.S. Consumer Product Safety Commission, Division of Hazard Analysis, May 13, 2004.

8 Raub, J. A., M. MathieuNolf, N. B. Hampson, and S. R. Thom. Carbon = Monoxide Poisoning - a Public Health Perspective. TOXICOLOGY (145):1-14, (2000.)

9 Liu, S. Krewski, D., Shi, Y, Chen, Y, and R.T. Burnett. 2003. Association between gaseous ambient air pollutants and adverse pregnancy outcomes in Vancouver, Canada. Environmental Health Perspectives. 111:1773-1778.

10 Ralston, J.D. and N.B. Hampson. 2000. Incidence of severe unintentional carbon monoxide poisoning differs across racial/ethnic categories. Public Health Reports. 115:46-51. U.S. Department of Health and Human Services.

11 Yoon, S., Macdonald, S., Parrish, G. 1998. Deaths from unintentional carbon monoxide poisoning and potential for prevention with carbon monoxide detectors. JAMA. 279(9): 685-687

12 U.S. Department of Housing and Urban Development. Healthy Homes Issues: Carbon Monoxide, Healthy homes Initiative Background Information, December 2005.

[http:// www.healthyhomestraining.org/Documents/ HUD/ HUD\\_CO\\_Brief.pdf](http://www.healthyhomestraining.org/Documents/ HUD/ HUD_CO_Brief.pdf) .

13 The Minnesota Department of Health, Environmental Health Services Division, "Carbon Monoxide (CO) Poisoning In Your Home," April 2007. <http://www.health.state.mn.us/divs/eh/indoorair/co/index.html>.

