

Carbon monoxide detectors: A powerful, underused way to protect lives

Carbon monoxide (CO) exposure is an important but underappreciated health concern. CO is the leading cause of accidental poisonings in homes, with exposure resulting in severe cardiovascular and neurobehavioral effects, and even death.¹ In Canada 1808 deaths from 1981 to 2009, and 1984 hospital admissions from 1995 to 2010, were attributed to accidental CO poisonings.² In BC there were 90 accidental CO poisoning deaths from 1998 to 2014. Because CO is an odorless, tasteless, and colorless gas, its presence indoors can be detected only through the use of CO detectors. These detectors warn people about the potential for CO poisoning in the same way that smoke detectors warn about the potential for acute fire-related smoke exposure. However, unlike smoke detectors, CO detectors are not widely used in homes.

CO is produced from incomplete combustion of carbon-containing fuels such as natural gas, gasoline, oil, and wood. Indoor CO concentrations are typically low, but harmful levels can result from persistent sources and poor ventilation. Indoors, CO is primarily emitted from poorly maintained or improperly vented appliances such as furnaces, fireplaces, and gas stoves.¹ Improper indoor use of appliances such as barbecues and camp stoves during power outages, as well as smoking indoors, also contribute to elevated CO levels. Outdoor-generated CO can also move indoors; motor vehicles are a major source of the gas, particularly when they are left idling near open windows and air in-

takes and in attached garages.¹

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exposure) can result in disorientation, unconsciousness, convulsions, and cardiorespiratory arrest. CO displaces oxygen from hemoglobin to form carboxyhemoglobin (COHb). Increased concentrations of COHb lower blood oxygen content and compromise oxygen unloading at tissue sites.¹ CO also binds to other heme-containing molecules such as myoglobin, further contributing to tissue hypoxia.¹ Persons with heart disease are considered most susceptible, although those with respiratory disease and anemia may also be at increased risk, as are pregnant women and the elderly. Nonfatal poisoning is linked to increased risk of cognitive decline.¹

Poisoning can be prevented by eliminating emissions and by using CO detectors. Indoor levels can be kept low through regular maintenance of fuel-burning appliances, adequate ventilation, and removal of sources such as idling vehicles from near air intakes and in attached garages. CO detectors are readily available from home hardware retailers, and their installation is simple. Detectors that set off an alarm when potentially life-threatening levels are reached over a given time period can signal the need for immediate evacuation. Detectors should be installed according to manufacturers' instructions but are generally placed near sleeping areas and on every level of the home.

The use of CO detectors in homes is linked to decreased CO-related morbidity and mortality;³ however, only Alberta, Manitoba, Ontario, Quebec, and Yukon mandate that CO detectors be installed in all or new homes with fuel-burning appliances or attached garages.⁴ Public awareness of CO also tends to be poor: a recent survey indicated that over 40% of Canadians do not regularly inspect their heating systems, nor do they have CO detectors installed in their homes.⁵

Education is key to lowering the CO-related burden of disease. By talking to their patients about CO exposure and the importance of CO detectors, physicians can help to increase uptake of this simple and effective public health intervention.

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References

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