

Think carbon monoxide

Gas heater use increases the risk of carbon monoxide poisoning in the home

During the cooler months, we need to be aware of the increased risk of accidental carbon monoxide (CO) poisoning from domestic gas heaters.

Specific causes include faulty installation, inappropriate use, inadequate maintenance, blocked flues and fires.

The signs and symptoms of CO poisoning are non-specific. Headaches, malaise, nausea and dizziness are common, and gradual cognitive deterioration and reduction in functional capacity have been reported in low-grade chronic exposure.¹ Further questioning should elucidate whether the symptoms are occurring in other members of the household (including pets), and whether the patient feels better when outside the house. Failure of health professionals to recognise the symptoms and signs of CO poisoning can result in the discharge of a patient back into a potentially fatal environment. At highest risk are older people, patients with comorbidities, children, pregnant women and their unborn babies.

CO is a colourless, odourless and tasteless gas resulting from the incomplete combustion of hydrocarbon fuels. It binds strongly with haemoglobin and cytochromes, preventing oxygen transport and its use in the tissues. This can result in end-organ damage.²

The diagnosis of CO poisoning is based on history and examination, in conjunction with an elevated carboxyhaemoglobin level determined using pulse CO-oximetry, arterial blood gas analysis or CO breath testing. The half-life of CO bound to haemoglobin is 4 hours when the patient is breathing room air. This poses a diagnostic challenge, as the level may have fallen significantly by the time of testing. Additionally, high-flow oxygen may be administered by ambulance officers,³ which further reduces the half-life.

The treatment of CO poisoning involves immediately removing the patient from the source and instituting high-flow oxygen. The patient should be transferred to an emergency department for full investigation and for consideration of hyperbaric oxygen therapy.⁴ Such patients are also susceptible to ongoing health issues, including delayed neuropathy and myocardial damage, and require follow-up.⁵

What should we tell our patients about prevention of CO poisoning in the home?

- Use accredited professionals to install gas appliances and service them every 2 years to ensure that no gas can leak.
- Never tamper with air vents on gas heaters.
- Never use external gas heaters in enclosed areas.
- Install a CO alarm in the house.
- Learn how to recognise CO poisoning.

By increasing awareness of CO poisoning, its prevention and treatment, we can reduce the incidence of this dangerous condition.

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- 2 Agency for Toxic Substances and Disease Registry. Toxicological profile for carbon monoxide. Atlanta, Ga: ATSDR, 2012. <http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=1145&tid=253> (accessed Jul 2014).
- 3 Shochat GN, Lucchesi M, DeBlieux PMC, et al. Carbon monoxide toxicity treatment and management. Medscape. <http://emedicine.medscape.com/article/819987-treatment#a1125> (accessed Jul 2014).
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- 5 Thom SR, Bhopale VM, Fisher D, et al. Delayed neuropathology after carbon monoxide poisoning is immune-mediated. *Proc Natl Acad Sci U S A* 2004; 101: 13660-13665. □