

## Where there's smoke, there's respiratory risk

Millions of Canadians will enjoy the ambience and warmth of a wood-burning stove or fireplace this winter, but experts say that both doctors and the public should be more aware of the associated potential health hazard.

Tiny particulates, produced from combusting wood are dangerous, especially for people with pre-existing respiratory issues, says Dr. Kenneth Chapman, president of the Canadian Network for Respiratory Care.

"It's the same thing that's harmful about tobacco smoke — minus the nicotine. There are volatile gases that you don't want to inhale and can irritate the airway and lungs," says Chapman, a professor of medicine at the University of Toronto.

Tobacco has traditionally been pinned as the leading cause of chronic obstructive pulmonary disease (COPD) in North America. But although tobacco use is decreasing, COPD has been rising for three years. In 2013, COPD was diagnosed in 4.3% of Canadian adults over the age of 35, an increase of 0.2% from 2011. Chapman says one possible contributing factor to the increase is exposure to wood smoke.

According to Statistics Canada, 12% of Canadian households use wood as heating in their homes; 4% rely on it as the primary source of heating. Health Canada recommends a number of safety tips including cleaning chimneys, using dampers properly and installing an "advance combustion" insert in wood-burning stoves.

However, the adverse effects of wood smoke don't come solely from direct indoor exposure; outdoor pollution is also to blame. A 2012 report by the Canadian Council of Ministers of the Environment (CCME) estimated that 104 kilotonnes of fine particulate matter was emitted to the atmosphere in Canada from residential wood combustion in 2010; 44% of these emissions came from Quebec.



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Wood smoke has volatile gases that you don't want to inhale, says an expert.

The level of air pollution is one reason that as of 2020, the City of Montréal will forbid wood burning stoves that emit more than 1.3 grams of fine particulate matter per hour. And beginning in February 2015, residents will have to declare their wood stoves, says Karine Price, a toxicologist at the Montréal Public Health Department. In addition, if there is a smog warning, the use of all types of wood-burning stoves will be forbidden.

The 2012 Canadian Council report recommends that wood-burning appliances meet Canadian Standards Association rules for emissions, output and efficiency, but compliance is voluntary unless regulated provincially or municipally. As of 2012, five provinces had legislation regulating wood-burning appliances and seven provinces offered incentives for upgrading to more efficient appliances.

Greater length and intensity of exposure to wood smoke increases health risks, says Chapman. Short, sporadic exposures such as a campfire or light-

ing a scented candle are not as serious, although they should be avoided by people with lung disease.

Wood smoke exposure is something Chapman says most Canadians and doctors are unaware of and could pay more attention to.

"If I've got a COPD patient, and I've got them to quit tobacco smoking, have I done a complete job? Is there any chance of them being exposed to smokes and fumes at their workplace setting, or at their winter cottage and home?"

Chapman says more research on the effects of wood smoke, and the number of patients affected is also needed. "These sorts of exposures and problems will become more apparent over time as tobacco smoke becomes less and less common."

The results of a large-scale, seven-year Australian study published in the *BMJ* in 2013, indicated that reducing the amount of wood smoke pollution was associated with reduced all-cause, cardiovascular and respiratory mortality.

**Global problem**

According to the World Health Organization, COPD is the third leading cause of death worldwide.

Jason Nickerson, a clinical scientist at the Bruyère Research Institute in Ottawa has seen these effects first hand as part of his work in programs concerning noncommunicable respiratory diseases in low-income countries. He says that if nothing changes, COPD levels in these countries will significantly increase because of

indoor pollution caused by cooking stoves.

These stoves are cheap and readily available, but they consume a lot of wood and produce a lot of pollution, says Nickerson, who is also a respiratory therapist. “The challenge is to find something that works more efficiently.”

Chapman agrees that this is a worldwide problem, “if you can’t afford a nice clean central heating system for your home fuelled by a safe fuel, but rely on wood-burning stove,

you are now at not just an economic disadvantage but a mortality disadvantage.”

“You may be a woman in South Asia, South America or Africa, never having smoked tobacco, but developing emphysema every bit indistinguishable from a two-pack-a-day smoker, because you’ve prepared food and heated your hut with burning wood or biological fuels.” — Dane Wanniarachige, *CMAJ*

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