

## **Deputation to City of Toronto Board of Health**

**March 24, 2014**

### **Exposure and Health Effects of Waterpipe Use**

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Waterpipe or Hookah is now widely used in Toronto and across Ontario, especially by youth and young adults. Recent data from the Ontario Student Drug Use and Health Survey indicate that past year use of a waterpipe among students in grades 7 to 12 was 10%, with use significantly increasing with grade, peaking at 19% in grade 12. These rates were actually higher than those for regular cigarette use.

The introduction of flavoured nicotine and non-nicotine waterpipe tobacco in the past two decades has led to a global epidemic of use that should not be confused with use of traditional hookah. Among the top flavours marketed to young people are bubblegum, chocomint and Jello Shots. Young people are generally unaware of the toxicity and health impacts of hookah use for both users and exposed non-users.

Waterpipe is smoked in lengthy sessions, 45 minutes to a few hours, usually in a group sharing one or two pipes. Waterpipes include lit charcoal, which warms the tobacco sufficiently to produce smoke, which passes through water in the pipe and is inhaled by the smoker. Smoke from waterpipes contains many of the same toxins found in cigarette smoke including carbon monoxide, nicotine, particulates, heavy metals and polycyclic aromatic hydrocarbons.

In 2012, with funding from the Ministry of Health and Long-term Care, the Ontario Tobacco Research Unit undertook a study of air quality in Toronto waterpipe cafés and on their patios. We measured small particulates in the air (PM<sup>2.5</sup>), ambient carbon monoxide (CO), and airborne nicotine; we also measured CO in the breath of our non-smoking field staff.

Acceptable levels of particulates are below 25 µ/m<sup>3</sup> (micrograms per metre cubed) and hazardous levels are reached at about 90 µ/m<sup>3</sup>. In Toronto waterpipe cafes, particulate levels averaged over 1400 µ/m<sup>3</sup>, with one venue reaching more than 17,000 µ/m<sup>3</sup>. For comparison, a dangerously polluted day in Beijing may reach 300 - 500 µ/m<sup>3</sup>.

Carbon monoxide levels were typically close to 25 ppm, the Ontario industry maximum for 24-hour exposure, and in one venue CO surpassed 100 ppm, the 15 minute limit for industrial exposure. Despite tobacco-free legislation that forbids

the use of nicotine in indoor public places, all venues studied showed significant levels of nicotine, with the average level greater than that found in smoky bars before indoor bans on cigarette use. Levels of breath CO for our non-smoking field staff reached levels typical of heavy smokers within two hours of exposure. Readings taken on outdoor patios were lower, but particulate levels were still at the “unhealthy” level.

At least three quarters of the toxicants in waterpipe smoke come from the burning of charcoal. Waterpipe cafés may have 25 or more charcoals burning at one time, producing large quantities of toxic smoke. The only difference in the level of toxicants in tobacco and non-tobacco hookah is the nicotine. Levels of particulates, CO, volatile aldehydes and benzene are the same.

Beginning in 2005, the WHO has issued warnings about the health hazards of using waterpipe. More recent research has confirmed serious health impacts on both users and exposed nonsmokers.

Exposure to high levels of particulates and CO is associated with heart and respiratory diseases, as well as various cancers. Waterpipe smoke has higher levels than cigarette smoke of benzene, a known cause of leukemia. Nicotine exposure has cardiovascular effects, and fetal effects for pregnant women, including increased risk for obesity and diabetes in offspring. When nicotine combines with common indoor gases, it produces tobacco-specific carcinogens that can circulate for hours. It is also responsible for creating addiction among many users. Nicotine may also be added to non-tobacco hookah and served without the user’s knowledge. Shared mouthpieces, or even shared pipes, increase risk of spreading serious infectious diseases, including meningitis, tuberculosis, herpes and hepatitis C.

In summary, despite the ban on indoor use of nicotine waterpipe, significant levels of nicotine are found in indoor waterpipe cafés. However, non-tobacco nicotine produces equally toxic smoke, and both products are a serious threat to public health. At this point, several countries where waterpipe has been used traditionally have already banned indoor use (Syria, Lebanon, Jordan, Dubai, Abu Dhabi, Turkey, Kazakhstan, and many parts of India and Saudi Arabia). In Canada, the Province of Alberta has recently banned indoor use of tobacco and herbal waterpipe products, and Quebec allows waterpipe use only in a few former cigar bars. Some US states and many communities have also banned indoor use of waterpipe.

There is no safe level of secondhand smoke, whether from traditional cigarettes, waterpipe, marijuana or herbal products. Hazardous exposure occurs both indoors and on outdoor patios. Since the evidence to date suggests that waterpipe smoke is at least as toxic as cigarette smoke, and probably more so, efforts are needed to dispel common misperceptions about reduced health risks associated with waterpipe use. Full protection of wait staff as well as patrons of waterpipe cafés is an urgent priority for public health.