

Welcome to today's webinar:

# Waterpipe Smoking – An Increasing Issue for Public Health

The fifth webinar in a collaborative series brought to you by OTRU & PTCC

**Start time: 10:30 A.M.**

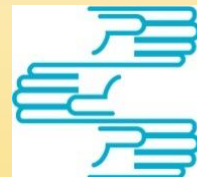
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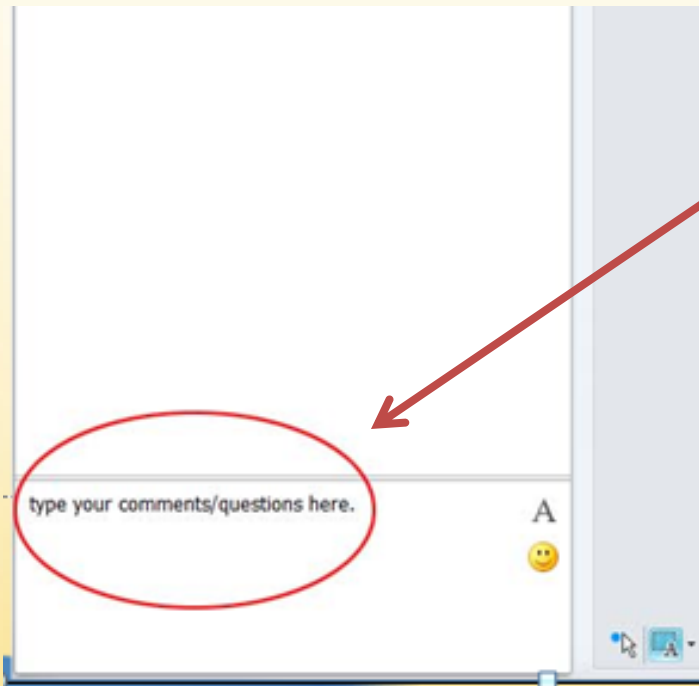
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# Roberta Ferrence



## **OTRU Principal Investigator and Deputy Director**

Roberta Ferrence is Professor in the Dalla Lana School of Public Health at the University of Toronto and an Affiliate Scientist with the Centre for Addiction and Mental Health. Her research interests include the epidemiology of tobacco use, the impact of tobacco policy on health, the role of tobacco products in mortality and morbidity, alternative forms of tobacco use, and economic factors in smoking behaviour.





# Misconceptions and Myths about Harms of Waterpipe Smoking

# Waterpipe vs Cigarettes

## MYTH

- Waterpipe tobacco smoking is less harmful & addictive than cigarettes

## TRUTH

- More frequent puffs and longer sessions result in much greater exposure to toxins and higher nicotine intake

# More Myths

## MYTH

- Harmful toxins are filtered out by water before being inhaled

## TRUTH

- Harmful toxins are NOT filtered out
- Water in the pipe cools the smoke and makes it less irritating but NOT less toxic

# Polling Question 1





# Herbal vs Tobacco Hookah

## MYTH

- Tobacco-free herbal hookah is “healthier” than tobacco hookah

## TRUTH

- Same toxins produced by tobacco hookah & herbal hookah (PAHs, VAs, CO)
- Herbal hookah may be mixed with tobacco or nicotine “juice”
- Herbal users often puff harder and inhale more toxicants

# Waterpipe Secondhand Smoke

- Waterpipe smoke includes charcoal & tobacco smoke
- Typical 1 hr session can generate carcinogens & toxicants 3-200 times the amount in cigarette smoke  
(= 2-10 cigarettes)
- Indoor air quality in hookah cafés show high levels of CO



# Waterpipe Smoke Toxicants

Waterpipe sidestream smoke compared to cigarette sidestream smoke from a single session emits approximately:

- 4 times PAHs – cause cancer
- 4 times Volatile Aldehydes – cause lung disease
- 30 times CO – contributes to CVD
- Nicotine – causes dependence



# Effects of Nicotine

- One-30 minute tobacco waterpipe smoking session causes acute changes in blood pressure & heart rate
- Daily tobacco waterpipe smoking results in nicotine absorption similar to smoking 10 cigarettes
- Significant exposure to tobacco-specific carcinogens
- Air nicotine combines with Nitrous Acid to form carcinogens that damage DNA

# What do we know about Health Effects of waterpipe use?



# What Health Effects of Waterpipe Use are Confirmed?

In Meta-analysis:

- Lung cancer (>2 fold)
- Respiratory illness (>2 fold)
- Low birth-weight (>2 fold)
- Periodontal (gum) disease (3-5 fold)

# What Health Effects are Likely?

- Esophageal cancer (2-fold)
- Oral dysplasia (>8 fold)
- Infertility (>2 fold)
- Heart rate variability (which compromises heart function)
- Users may get serious acute effects: major headaches that can last for days; nausea; fainting



# Other Likely Health Effects

- COPD (Emphysema etc.)
- Reduced lung function
- Cardiovascular disease
- Nicotine dependence
- Infectious diseases from shared mouthpieces or tubes (Hepatitis, TB, Meningitis)

# Polling Question 2



# Waterpipe vs Cigarettes

- Same constituents as cigarettes but in different proportions:
  - Carcinogens, particulates, heavy metals, carbon monoxide and other toxic gases
- Can expect similar health effects to cigarette smoking, which took a century to establish
- Co-use is common
  - with tobacco/herbal/cigarettes/  
marijuana/alcohol/other drugs

# Herbal vs Tobacco Hookah

*No difference in levels of*

- CO
- Nitric oxide
- Tar
- PAHs (e.g., Benzopyrene)
- Volatile aldehydes (e.g., Formaldehyde, Acetone)

*Only difference is level of nicotine*

# Herbal vs. Tobacco Hookah

- Waterpipe use decreased Heart Rate Variability for both tobacco and herbal (can cause serious problems)
- CO increased with both tobacco and herbal
- Herbal users inhaled more smoke than tobacco users
- Tobacco use increased heart rate, blood pressure

# What do Users say about Herbal product?

*“Soex is a product some love and some hate. It is not bad but not as good as tobacco. The issue is that most people compare it to tobacco and of course Soex will not appeal to tobacco smokers.”*

- Online Hookah Forum

Who is Smoking Waterpipe?



# Waterpipe Use Among Canadian Adults

(CTUMS/StatCan: 2006; 2011)

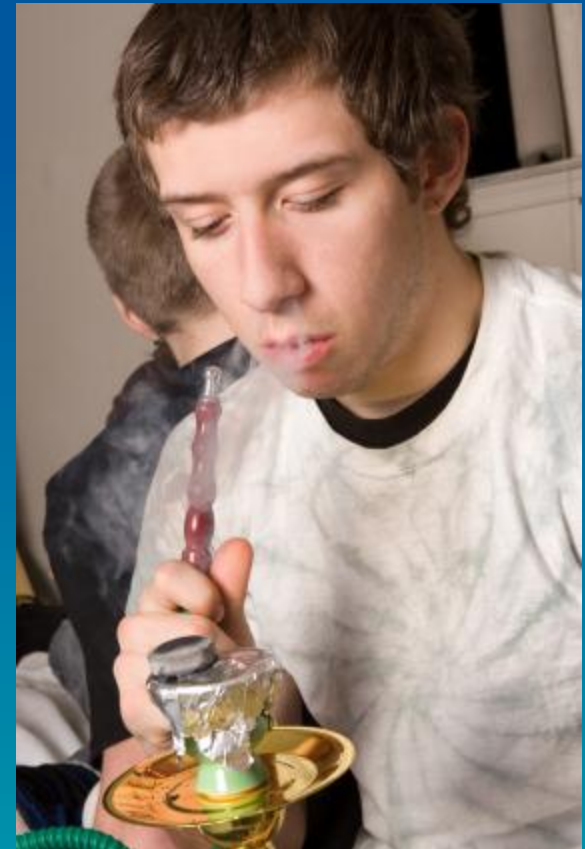
Ever use increased from  
4% to 8% from 2006 to 2011

# Waterpipe Use Among Canadian Youth

Canadian Students

Grades 7-12, 2006; 2011

- Past month use increased from 3% to 5%, 2006 to 2011
- 14% of current smokers used waterpipe vs less than 1% of never smokers



# Why Study Waterpipe in Toronto?

- Increasing use of waterpipe, especially among youth
- Increase in waterpipe availability, venues
- Lack of regulation of use, packaging, warnings, etc.
- Difficulty enforcing Smoke Free Ontario Act – herbal exempted
- Misinformation about safety
- New information on exposure to herbal and tobacco waterpipe



# Waterpipe Cafés in Toronto



# Study Design

- 17 cafés of 30 provided by TPH:
  - 12 indoors, 5 on patios
  - Served waterpipe during evening
  - Feasible to collect air quality data
- July-Aug: Site selection
- Aug – Oct: Air quality and descriptive measures in several areas of city
  - 9pm-12 midnight



# Air Sampling Methods

- TSI SidePak to measure ultra fine particles ( $<PM_{2.5}$ )
- TSI Q-Trak to measure carbon monoxide
- Active Nicotine Sampler to measure air nicotine
- piCO+ monitor to measure breath CO and COHb (CO in blood) for non-smoking research staff





# Other Data Collection

- # Burning waterpipes
- # Burning cigarettes
- Temperature
- Humidity
- Carbon Dioxide
- Descriptive data for each venue
- Descriptive data for patrons





# What We Found

Some examples of readings in  
waterpipe cafés

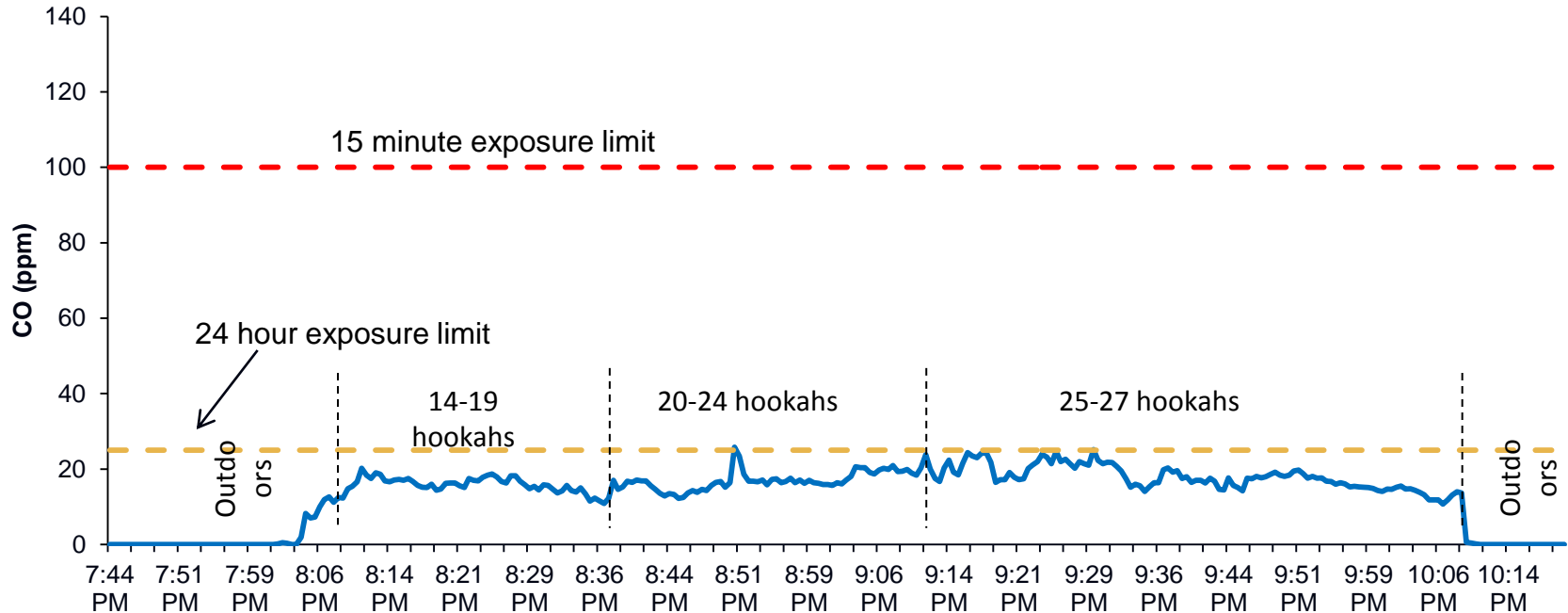
# Venue #4

- Commercial area in inner suburb
- Mainly young adults; some middle-aged
- Mix of males and females
- Very poor ventilation
- Separate room, from food service area, where patrons smoke shisha
- Waterpipe served on main floor and in basement



Nicotine=Smoky Bar

**AQI: Very Poor**



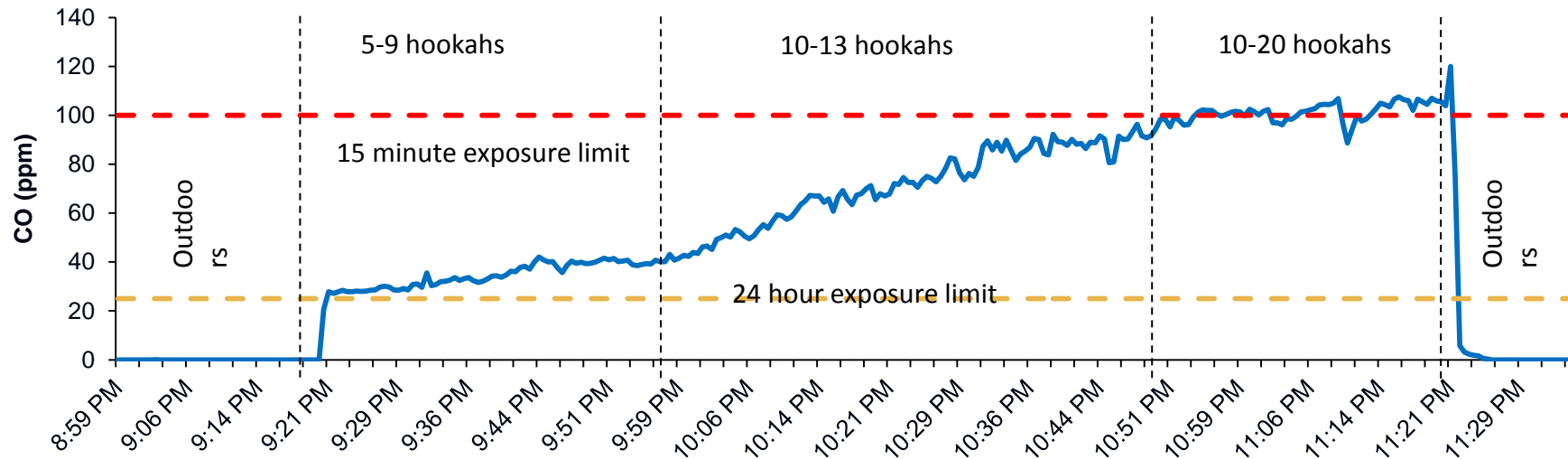
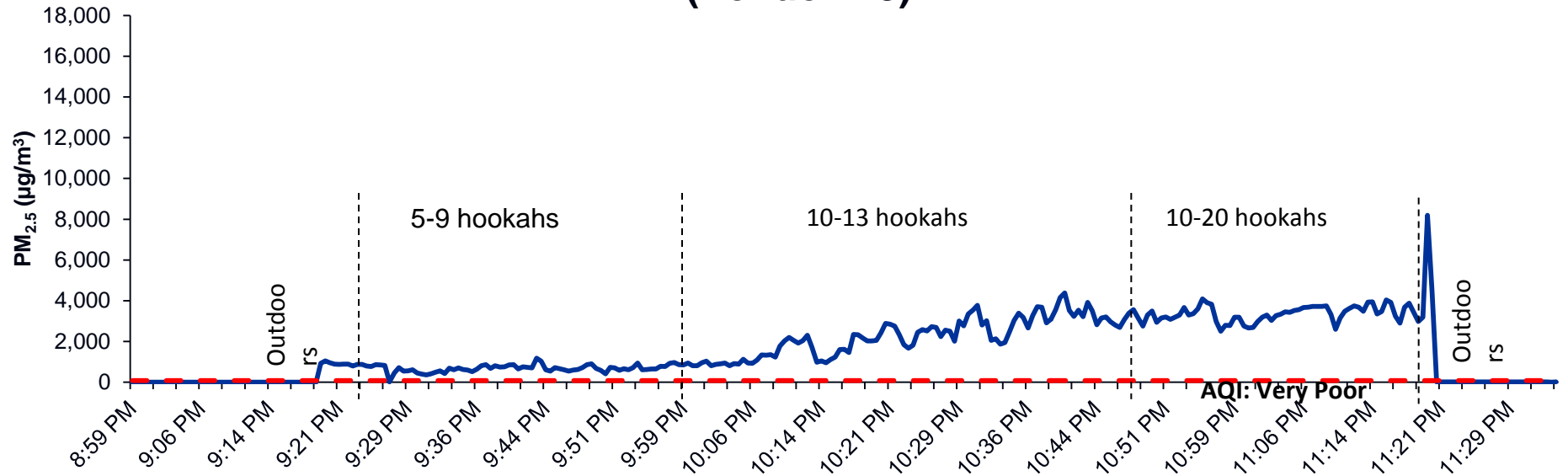
# Venue #13

- Local commercial area in outer suburb
- Mix of young & old patrons
- Ventilation system had some diffusers along ceiling and built-in ceiling AC/heating units
- Busy venue with many tables in a small area



# PM<sub>2.5</sub> and CO Indoors

## (Venue #13)



# Waterpipe vs Cigarette Smoking Levels (Median)

**PM<sub>2.5</sub>** (µg/m<sup>3</sup>) Hazardous 91+

Kentucky: Cigs Pre-ban: 67-304

Post-ban: 9-32

Toronto: Waterpipe Indoor: 692

Outdoor: 35

**CARBON MONOXIDE** (ppm)

São Paulo: Cigs Indoors pre-ban: 4.6 (mean)

Toronto: Waterpipe Indoors: 12.5

# Is Tobacco Hookah Used in Toronto Waterpipe Cafés?

Median Nicotine levels in other cities with and without cigarette smoking bans:

- With Bans: 0.09  $\mu\text{g}/\text{m}^3$  (0.03-0.17  $\mu\text{g}/\text{m}^3$ )
- Without Bans: 2.83  $\mu\text{g}/\text{m}^3$  (0.57-4.56  $\mu\text{g}/\text{m}^3$ )

In Toronto indoor Hookah cafés

- 0.0 – 0.19 0
- 0.20 – 0.50: 1
- 0.51 – 1.00: 4
- 1.01 – 3.00: 1
- 3.01 – 8.00: 6

Nicotine found in all cafés studied—half above average of cafés with cigarette smoking



# Non-smoking Staff CO Exposure

## Breath CO

Before entry: 1-3 ppm

In venue: 1-70 ppm

12.6ppm (mean)

## *Reference Points:*

*Non-smoker 0-6 ppm*

*Smoker 11-15 ppm*

*Addicted smoker 26-35 ppm*



# Economic Factors

- Frequent openings and closing of Waterpipe businesses
- Frequent changes in owners, managers, name of establishment
- Downtown locations have diversified and include high end menus and alcohol



# Current Issues

- High levels of exposure in WP cafés
- Perception of low health risks
- Misleading advertising claims
- Lack of public information on hazards



- Hookah bars normalise Waterpipe use and can introduce it to communities

# Current Issues

- Youth targeted with flavoured product
  - Bubble gum, Piña colada
- Easy access / low cost
- Lack of health warning labels
- Includes contraband
- Possibility of “Big Tobacco”  
entering market
- Herbal hookah used to undermine  
enforcement of protection laws

# How Does Waterpipe Compare to other Indoor Use of Charcoal?



# Korean BBQ

- Most Korean BBQ restaurants in Toronto now use gas or propane
- Only one venue in Toronto uses a combination of charcoal and gas



# What We Found

- CO levels low with both gas and charcoal
- PM<sub>2.5</sub> acceptable with gas in most cases
- PM<sub>2.5</sub> higher with charcoal but sporadic and much lower than waterpipe

# The Bottom Line

- Work staff and patrons exposed to unsafe levels of CO & particulates
- Most cafés serve tobacco hookah
- Patrons don't know what they're smoking
- Herbal product also has hazardous levels of CO & PM<sub>2.5</sub>
- Continued waterpipe use in public places could undermine existing smoking bans





# What's Needed Now

- Smoke free policies that include waterpipe smoking indoors and outdoors
- Policies to regulate flavourings & product descriptors; health warnings
- Increased public awareness of myths & misconceptions
- Improved surveillance of patterns of use
- Coordinated global response



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*Generating knowledge for public health*



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