

PUBLIC HEALTH GRAND ROUNDS

Nicotine

Dr. Alex Wong, MD MBA MHSc CCFP FRCPC DRCPSC

Medical Health Officer

Addiction Medicine Consultant

Dr. Mathilde Billau, MD MGSC

PGY-1 Public Health and Preventive Medicine &

Family Medicine

Land Acknowledgement



Nuu-Chah-Nulth Tribal Council, 2026

Island Health acknowledges with respect and humility the Coast Salish, Nuuchahnulth and Kwakwaka'wakw Peoples on whose unceded traditional territories we offer our services and programs.

As a health organization, we are committed to identifying and addressing the historical and ongoing health impacts of colonization and Indigenous-specific racism to promote a culturally safe work environment.

Presenters

Dr. Alexander Wong

Dr. Wong is a Medical Health Officer for Central Island with responsibility for Cowichan and Alberni-Clayoquot. He completed his family medicine and public health residency at the University of Calgary, in addition to an addiction medicine fellowship at UBC. He continues to practice inpatient and outpatient addiction medicine as a consultant at St. Paul's Hospital.

Dr. Mathilde Billau

Dr. Mathilde Billau is a first-year resident physician in Public Health and Preventive Medicine at the University of British Columbia. She completed her medical degree at the Université de Sherbrooke and a Master of Global Surgical Care at UBC. Her interests include injury prevention, Indigenous health, and the health of rural and remote communities.

Objectives

- 01** **Describe** the health impacts and epidemiology of tobacco, vaping and nicotine product use in BC.
- 02** **Apply** evidence-based cessation interventions for tobacco, vaping and nicotine use, and compare their relative effectiveness.
- 03** **Identify** effective policy interventions and physician advocacy approaches to reduce population-level harms from tobacco, vaping and nicotine products.

Outline

- 01 **Background** What tobacco, nicotine and vaping are, and how they harm
- 02 **Epidemiology** Use across Canada, in youth, and within BC
- 03 **Cessation** Strategies, withdrawal, and first-line medications
- 04 **Comparison** Comparing the pharmacotherapies
- 05 **Policy** Policy and physician advocacy

01

Background & Epidemiology

DEFINITIONS

Tobacco and Nicotine

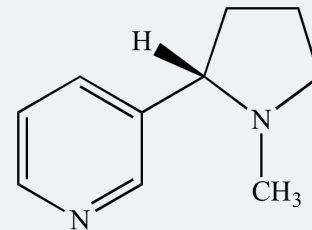
Tobacco

A plant (*Nicotiana tabacum* and *Nicotiana rustica*) that contains nicotine. Its leaves are cured, fermented and aged before being manufactured into tobacco products, such as cigarettes, cigars, and chewing tobacco.



Nicotine

A CNS stimulant that is an agonist at the nicotinic acetylcholine receptor and activates reward pathways. Increasingly delivered by synthetic nicotine products manufactured free of tobacco leaf — e-cigarettes/vapes, pouches.



MECHANISM OF HARM

Health Impacts of Smoking

Cigarettes involve burning tobacco, which produces toxic combustion chemicals including tar, carbon monoxide and PAHs.

These are primary drivers of smoking-related diseases (e.g., lung cancer, COPD, CVD).

7,000+

chemicals in
tobacco smoke

70+

known
carcinogens



What About for Vaping?

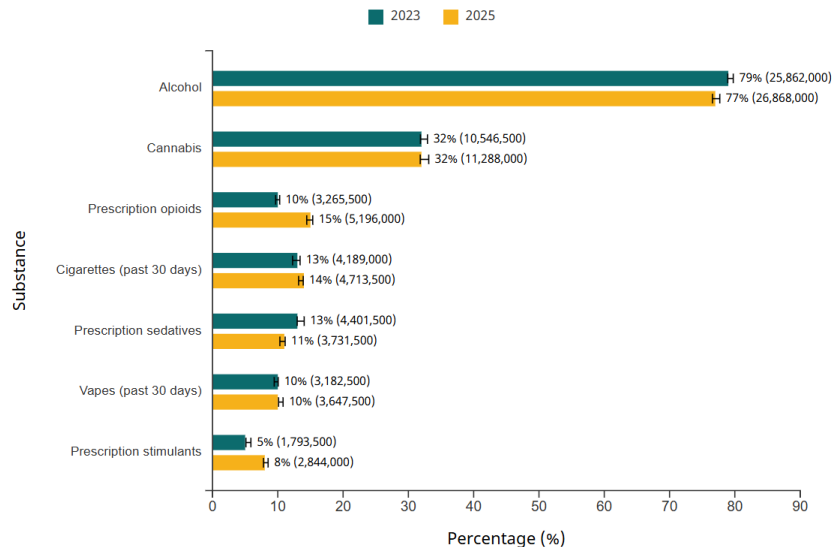
- Vapes deliver nicotine without combustion, heating liquid to create an inhalable aerosol. Not risk-free, though clearly less harmful than cigarettes.
- They do contain other chemicals (e.g., formaldehyde, propylene glycol, flavourings), with concern for metal contaminants as heating elements age.
- Main concerns with vaping: lung damage, neurocognitive changes (esp. youth), physical dependence, and appeal to youth/non-smokers.
- Long-term studies evaluating the health impacts of vaping are limited and still ongoing.

Systematic review by Kundu et al. published in 2025 in Heart found that while e-cigarettes resulted in transient increases in HR and BP: *“there is lack of evidence supporting any association of e-cigarette use with cardiovascular diseases and cardiac dysfunction.”*



Cigarette and Vape Use in Canada

Figure 1: Percentage and number of people aged 15+ in Canada reporting legal ² substance use in the past 12 months, 2023-2025



13.5%

smoked in past
30 days

8.9%

daily cigarette
use

10.5%

vaped in past
30 days

6.1%

daily vaping
use

Canadian Substance Use Survey, 2025 — Canadians aged 15+

AGES 15-24

Focusing on Youth

Past-30-day use

26%

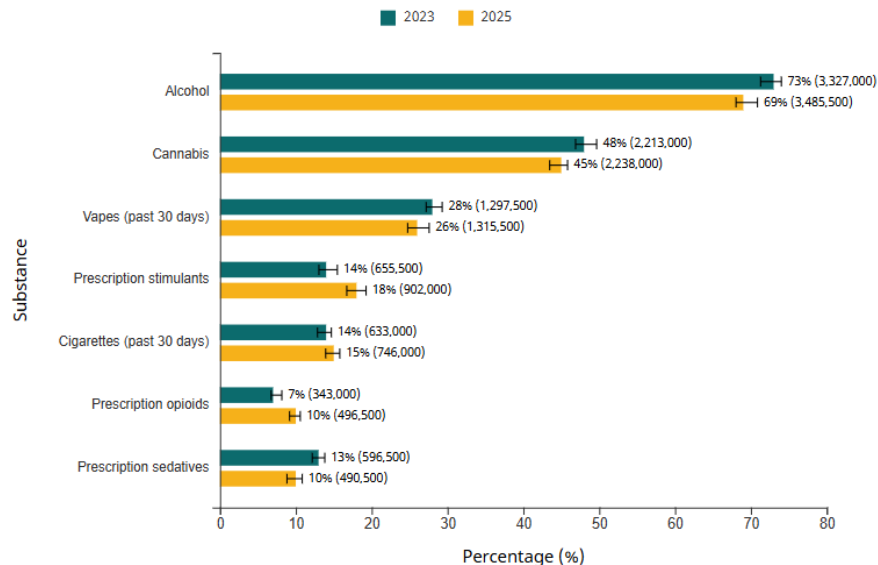
vaped

15%

smoked cigarettes

There is a lack of surveillance of other nicotine products.

Figure 3: Percentage and number of youth and young adults (aged 15-24) reporting legal ² substance use in the past 12 months, 2023-2025

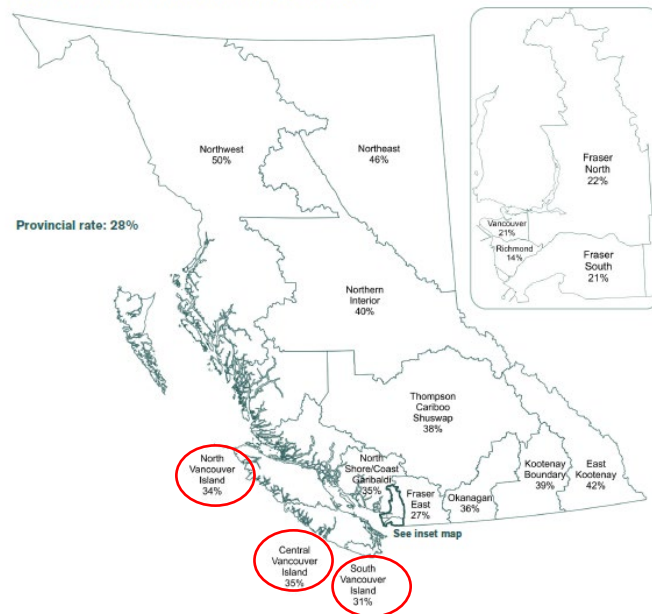


Within BC

- British Columbia has the lowest smoking rate in Canada — 12.4% of people aged 15+ report cigarette use in the past 30 days.
- On Vancouver Island, about 8.6% of adults currently smoke (PHSR 2025).
 - Tobacco is the leading cause of premature deaths in Island Health (and BC), with a rate of 75.01 deaths per 100,000 population (compared to 30.52 for alcohol and 5.59 for opioids).
- Despite this, **BC has one of the highest provincial rates of vaping in the past 30 days among those aged 15+** (also 12.4%), behind only SK, AB and NL.
- Youth vaping is common here too: more than 31% of Island students in grades 7–12 have ever vaped, above the BC average of 28% (McCreary 2026).

Source: *Nicotine Use Among BC Youth* — McCreary Centre Society, 2026

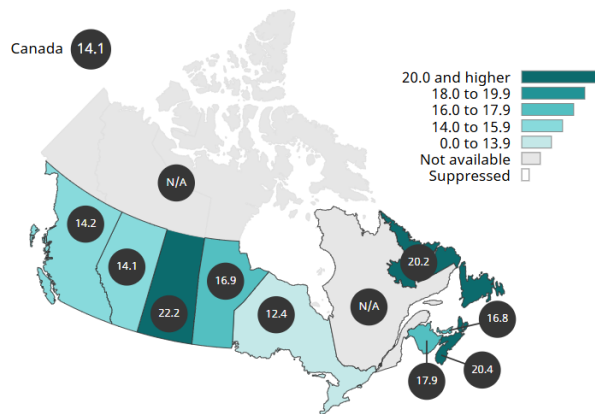
Youth who had ever smoked tobacco and/or vaped



WHO IS MOST AFFECTED

Youth in BC

Percentage of grade 7-12 students in Canada who reported using e-cigarettes with nicotine in the past 30 days, by province



For vaping in the past 30 days, the BC youth rate (14.2%) sits around the national average.

Youth who vape daily are more likely to:

- Have been born in Canada (16% vs 11%)
- Attend rural schools (19% vs 15%)
- Be older (18% of 16-year-olds vs 5% of those 12 or younger)
- Have first vaped at a very young age

Nicotine Pouches

- Approved by Health Canada for adults for smoking cessation.
- Currently only available in BC for legal purchase behind the counter at pharmacies.
- Globally, pouches have been gaining popularity as nicotine products — prevalence of 2.6% among Quebec secondary students in a 2026 study (Battista et al. 2025)



02

Nicotine Cessation

Behavioural Interventions

The 5 A's

Ask about smoking status

Advise about harms of smoking and benefits of cessation

Assess readiness to quit

Assist with smoking cessation (emphasize medication)

Arrange follow-up — quit lines, counselling, apps

Cessation counselling and treatment is one of the most beneficial preventive interventions for cardiovascular disease.

NUMBER NEEDED TO TREAT

107 statins, to prevent 1 death over 5 years

125 antihypertensives, to prevent 1 death over 5 years

80 5 minutes of MD advice to stop smoking, to prevent 1 premature death

38–56 the same advice plus cessation medication

WHAT TO EXPECT

Nicotine Withdrawal

Should be discussed early on so patients know what to expect.

Increased appetite

Weight gain

Mood changes
(dysphoria, irritability)

Insomnia

Restlessness

Anxiety

Difficulty concentrating

Peak: first 3 days after quitting

Resolution: subside over 3–4 weeks

Cessation Strategies

Set a quit date or reduce gradually

- The conventional approach: choose a date within the next 2–4 weeks of the initial appointment.
- A more gradual reduction in usage is an alternative — both approaches produce similar quit rates.

Smoking while on NRT

Concurrent cigarette smoking plus NRT has not been shown to pose increased risk of adverse events.

Duration is individual

Optimal duration should be patient-specific. Many require longer than 3 months; longer is unlikely to be harmful — especially compared with smoking (though only 12wks covered per calendar year).

EVIDENCE

Cessation vs Reduction

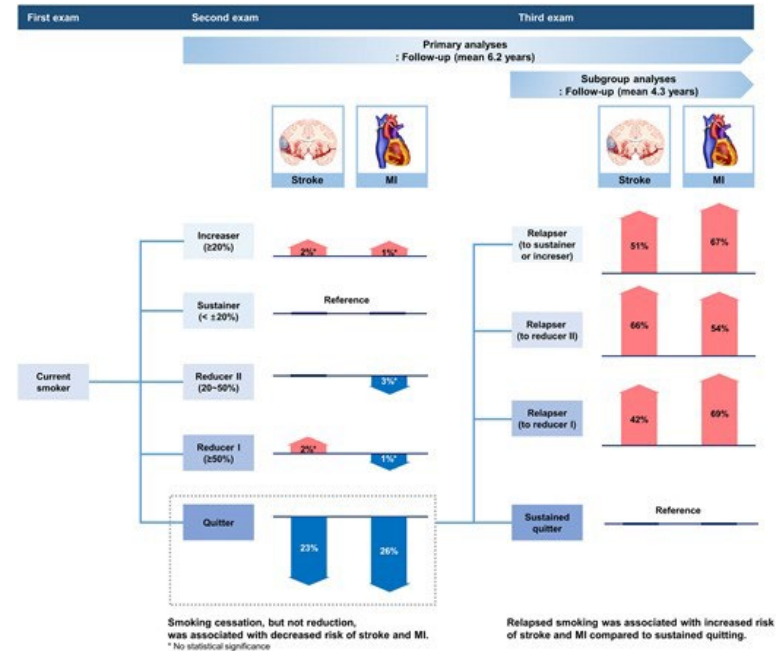
- Large prospective cohort of 897,975 smokers over 40 in South Korea, followed for 6 years; classified as quitters, reducers, sustainers or increasers.
- Quitters had significantly decreased risk of MI/CVD; risk for reducers was not significantly different from sustainers.
- Reduction in cigarettes smoked did not significantly reduce CV risk — only sustained cessation does.

JOURNAL ARTICLE

Smoking cessation, but not reduction, reduces cardiovascular disease incidence FREE

Su-Min Jeong, Keun Hye Jeon, Dong Wook Shin ✉, Kyungdo Han, Dahye Kim, Sang Hyun Park, Mi Hee Cho, Cheol Min Lee, Ki-Woong Nam, Seung Pyo Lee
 Author Notes

European Heart Journal, Volume 42, Issue 40, 21 October 2021, Pages 4141–4153,
<https://doi.org/10.1093/eurheartj/ehab578>



Overview of Pharmacotherapy

01

Nicotine Replacement Therapy

Long acting — patch

Short acting — gum, inhaler, lozenges

02

Varenicline

Nicotinic acetylcholine receptor (nAChR) partial agonist

03

Bupropion

Norepinephrine-dopamine reuptake inhibitor

Nicotine Replacement Therapy

- Reduces physiological withdrawal symptoms; absorbed via the venous system.
- Compared to cigarettes, carcinogens and other combustion chemicals are not present.
- Titrate NRT as with any drug. Manage cessation like other CV risk factors — if BP or cholesterol is not at target, you adjust the dose.
- More effective to pair long-acting plus short-acting form to breakthrough cravings.

Inadequate NRT is a frequent cause of cessation failure.

Long acting — patch

Dosed in multiples of 7 mg. Start at roughly 1 mg per cigarette per day and titrate to effect; more patches can be added.

Short acting — gum, lozenge, inhaler, spray

- Nicotine absorbed through the buccal mucosa
- Can be used PRN alongside the patch
- Teach patients the “chew and park” technique for gum

Varenicline

Mechanism

High-affinity partial nicotinic acetylcholine receptor agonist. Dopamine release reduces cravings and withdrawal, while blocking the reinforcing effects of nicotine from cigarettes.

Dosing

0.5 mg PO OD × 3 days, then 0.5 mg BID × 4 days, then 0.5–1 mg BID × 12 weeks.

- **If no response at 4–6 weeks**, can increase to 3 mg/day (1 mg AM + 2 mg PM), watching for increased adverse effects.
- Generally, quit attempt 1 week after starting.

Triples the likelihood of quitting

Side effects

Nausea (30%)

Take it with a big glass of water.

Insomnia, vivid dreams

Take it with dinner rather than qHS.

Neuropsychiatric Risk

Neuropsychiatric safety and efficacy of varenicline, bupropion, and nicotine patch in smokers with and without psychiatric disorders (EAGLES): a double-blind, randomised, placebo-controlled clinical trial

[Prof Robert M Anthenelli, MD, ^a](#) [✉](#) · [Prof Neal L Benowitz, MD ^b](#) · [Prof Robert West, PhD ^c](#) · [Lisa St Aubin, DVM ^d](#) · [Thomas McRae, MD ^d](#) · [David Lawrence, PhD ^d](#) · et al. [Show more](#)

2008

The US FDA and Health Canada issued a black box warning for varenicline regarding neuropsychiatric events, including depression, self-harm and suicidality.

2016

EAGLES — Evaluating Adverse Events in a Global Smoking Cessation Study. 8,000 patients across two cohorts: those with psychiatric disorders and those without.

No significant increase in serious neuropsychiatric events attributable to bupropion or varenicline compared with placebo, in either group.

Bupropion SR

Dosing

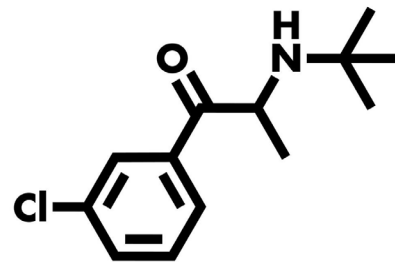
150 mg PO OD × 3 days, then 150 mg BID × 12 weeks.
Quit attempt 1 week after starting.

Mechanism

Norepinephrine–dopamine reuptake inhibitor. The mechanism for smoking cessation is unknown; maintaining dopamine and norepinephrine is thought to reduce withdrawal symptoms.

Doubles

the chance of quitting



REFERENCE

First-line Pharmacotherapy at a Glance

Agent	Mechanism	Dosing	Key points
NRT	Replaces nicotine	Patch + short-acting (gum/lozenge/inhaler); ~1 mg per cigarette, titrate	Combine long-acting and short-acting; no prescription needed in BC
Bupropion SR	NE–dopamine reuptake inhibitor	150 mg OD × 3d, then 150 mg BID × 7–12 wks	Doubles quit rate; avoid if seizure or eating-disorder history
Varenicline	Partial nicotinic-receptor agonist	0.5 mg OD × 3d, 0.5 BID × 4d, then 0.5–1 mg BID × 12 wks	Most effective single agent ; nausea ~30% (with food)

Comparison of Pharmacotherapies

Pharmacological interventions for smoking cessation: an overview and network meta-analysis (Review)

Cahill K, Stevens S, Perera R, Lancaster T

- 2013 Cochrane review that compared NRT, bupropion and varenicline with placebo and versus each other in achieving long-term abstinence (>6 months)



Comparison of Pharmacotherapies

VERSUS PLACEBO

Combination NRT

OR 1.84

Bupropion

OR 1.82

Varenicline

OR 2.88

All three were superior to placebo.

HEAD TO HEAD

Bupropion vs NRT
equal efficacy

OR 0.99

Varenicline vs bupropion
varenicline superior

OR 1.59

Varenicline vs single-form NRT
varenicline superior

OR 1.57

What If Not Ready to Quit?

Offer varenicline anyway.

2020 American Thoracic Society (ATS) guidelines strongly recommend that varenicline be offered/initiated even if the patient does not have an intention of quitting smoking.

It should be explained as a medication that reduces the compulsion to smoke, and helps move patients along the stages of change.

Role for E-Cigarettes in Cessation

- A Cochrane systematic review by Lindson et al. (2024) found high-certainty evidence that e-cigarettes increase quit rates compared to NRT.
- No serious harms were detected, though no long-term studies were available.
- The Canadian Task Force on Preventive Health Care recommends **against** e-cigarettes for smoking cessation, except for those who have unsuccessfully attempted other interventions.

Conclusion

E-cigarettes are effective in helping individuals quit cigarette smoking — but they are obviously not good at getting individuals to quit nicotine.

03

Policy & Physician Advocacy

MPOWER

Beyond offering cessation interventions to individual patients, physicians have a key role to play in advocacy related to nicotine and tobacco. The WHO MPOWER framework sets out measures that reduce harms at a population level.

M Monitor tobacco use

P Protect people from second-hand smoke

O Offer help to quit

W Warn about the dangers of tobacco/nicotine

E Enforce bans on advertising, promotion and sponsorship

R Raise taxes and prices

Policy Levers

Policy levers reduce harm at the population level – goal is to **DENORMALIZE** tobacco/nicotine use:

Price and taxation

The single most effective lever. A 10% price increase cuts consumption by about 4%, with larger effects in youth.

Flavour and product limits

Federal nicotine-pouch flavours capped at mint/menthol (2024); BC restricts flavoured vapes to age-gated stores.

Limits on youth access and marketing

Plain packaging, retail-density controls, behind-the-counter placement.

Smoke-free and vape-free spaces

Including workplaces, schools, public events.

Risks & Emerging Challenges

Emerging Products & Marketing

- Lifestyle marketing approach towards youth, youth friendly appeal (flavours, technology)
- Rapid growth, popularity and access to new nicotine products
- Social media normalization and trends
- Marketing as 'Tobacco Free'
- Branding and packing
- Pop culture smoking comeback?

Health Impacts

- Flat rate in decline in smoking
- High rates of vaping in youth leading to long-term nicotine dependency and alterations in developing brain
- Impacts in school settings smoking/vaping on school grounds and capacity & capability related to health education for substances

Regulatory Gaps

- Lack of/limited online regulation and limitations
- Product innovation is outpacing implementation of legislation
- Absence or lack of specific regulation on nicotine pouches/emerging nicotine products
- Flavoured vapour products debate – delay of national federal flavour ban
- Branding and packaging - e.g. mimic candy brands



Key Takeaways

- 01 Although cigarette smoking rates continue to decline, use of nicotine products is increasing — particularly concerning for youth, given the alteration of brain development with potential long-term changes to mood, attention and cognition/
- 02 Offer counselling and cessation therapies to all patients endorsing nicotine use. Varenicline, NRT and bupropion are the first-line pharmacotherapy options.
- 03 While vapes/e-cigarettes can be effective for smoking cessation, they are not effective for nicotine cessation.
- 04 Physicians have a key role to play in advocating for population-level policy interventions to reduce harms from nicotine.

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Thank you!

- Alexander.Wong2@islandhealth.ca
- Mathilde.Billau@islandhealth.ca
- Michelle.Dennis@islandhealth.ca



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Thank You!

Questions?