

Addiction Repackaged: Canada's Challenge with Novel Nicotine Products

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Key Recommendation: Canada must implement comprehensive, evidence-based regulation of synthetic nicotine and other novel nicotine products before industry innovation outpaces youth protections. Addictive products should not be allowed to exploit regulatory loopholes to reach, attract, and foster dependence in young people.

Background

The harms of combustible tobacco are well established: By exposing users to toxic combustion products, cigarettes remain a leading cause of preventable cancer, respiratory and cardiovascular disease, and premature death.¹⁻⁴ Electronic cigarettes (“e-cigarettes” or “vapes”) were introduced as smoking cessation tools designed to deliver nicotine without inhaling cigarette smoke.¹⁻⁴ However, through product design, formulation and marketing strategies—including sweet flavours, discreet devices, high nicotine concentrations and youth-oriented promotion -- e-cigarettes rapidly expanded beyond their intended role as treatment for refractory adult smokers and contributed to a new generation of nicotine dependence among young people and never-smokers.^{1,2,4,5}

A similar pattern is now emerging with a new generation of nicotine products, including oral nicotine pouches, lozenges, gums, tablets, and toothpicks.^{2,6} These products may contain tobacco-derived nicotine, laboratory-manufactured synthetic nicotine, or nicotine analogues—chemical “look-alikes” that are highly similar to nicotine and are often promoted as “safer nicotine alternatives” despite limited evidence to support such a claim.⁶⁻⁹ **Alarming, these products are formulated and marketed in ways that appeal to youth and never-users of tobacco, enable discreet use, normalize recreational nicotine consumption, promote addiction, and blur the boundaries between evidence-based cessation support and consumer nicotine-containing products.**⁶⁻¹⁰ In this

respect, novel nicotine products risk repeating the e-cigarette story: a harm reduction innovation for adult smokers that, without timely safeguards, evolves into a driver of youth nicotine initiation and dependence.

Regardless of whether the nicotine is tobacco-derived, synthetic, or constituted as a nicotine analogue, novel nicotine products pose significant health risks to Canadian youth and adolescents.^{2,6,8}

Nicotine exposure has immediate health consequences including adverse cardiovascular and vascular effects^{3,4,11}, oral tissue damage⁷, reproductive harms¹², and disruptions in metabolic regulation¹¹. During adolescence, nicotine negatively affects brain systems involved in reward, impulse control, decision-making, attention, learning, and executive function, increasing the risk of dependence.^{5,13-15} For young children, concentrated nicotine products that are flavoured, scented, or candy-like also carry an immediate risk of unintentional ingestion, reflected in the sharp rises of pediatric nicotine poisoning reports in peer nations.^{6,16}

Sadly, Canada’s regulatory framework has not kept pace with this rapidly evolving market.⁶ *The Tobacco and Vaping Products Act (TVPA, 2018)* provides some important safeguards for tobacco and vaping products; however, many non-vape nicotine-containing products,

such as synthetic nicotine pouches, fall outside the scope of these protections.¹⁷ Currently, certain non-tobacco and non-vape nicotine products that contain ≤4 mg nicotine per unit, such as some pouches, gums, sprays, and tablets, are regulated as natural health products (NHPs) under the **Food and Drugs Act** while other higher dosage products remain regulated as pharmaceutical products.^{18–20} Meanwhile, there is added uncertainty about how future products containing nicotine analogues, which are not chemically defined as nicotine, will be classified and regulated.^{6,17,20}

This fragmented regulatory landscape creates a critical mismatch between the level of oversight applied to these products and the potential public health risk.

Despite differences in nicotine origin, product format, and regulatory classification, these products share core characteristics: they deliver an addictive substance, may be designed – intentionally or inadvertently – to appeal to youth, and are often accompanied by unregulated or misleading claims regarding safety and cessation.^{4,6}

Canada needs a comprehensive regulatory framework to ensure that all nicotine- and nicotine analogue-containing products are subject to safeguards proportionate to their potential harms, while preserving access to evidence-based adult smoking cessation therapies.

Paediatric harms associated with nicotine use

Dependence, Withdrawal, Substance Use Disorders and Lifelong Psychiatric Comorbidity

Once absorbed, nicotine increases heart rate and blood pressure while stimulating dopamine release, producing effects that users perceive as improved concentration, stress relief, or mood regulation.^{4,5,14} Adolescents are particularly vulnerable to nicotine's reinforcing influence: compared with adults, the developing brain is

more sensitive to nicotine's rewarding effects and less deterred by its aversive effects, while neurology systems supporting impulse control and long-term decision-making are still maturing.^{5,14,15} With repeated use, tolerance and dependence develop rapidly. Within weeks, abrupt cessation can trigger withdrawal symptoms, including impaired concentration, irritability, anger, anxiety, low mood, insomnia, restlessness, and social difficulties. These symptoms perpetuate a cycle of craving, withdrawal, and nicotine use, resulting in nicotine use disorder.^{5,13}

Nicotine exposure in adolescence also raises fundamental concerns about brain development.^{5,14} Nicotine has been linked to impaired attention, increased impulsivity, and disruptions in memory and spatial learning.^{5,8,14} Emerging evidence from a 2024 mouse-model study further suggests that adolescent nicotine exposure may halt the maturation of dopamine reward circuits, locking them in an adolescent-like state.^{15,21} Together, these findings raise concerns about lasting impacts on cognition, emotional regulation, and addiction vulnerability. These harms may be compounded with pressures already present in a young person's life, including peer influence, school stress, socioeconomic adversity, mental health conditions, and co-use of other substances.^{5,14,15} **Consequently, adolescent nicotine use should not be understood as harmless experimentation. It can initiate a self-reinforcing pattern that adversely affects academic performance, emotional regulation, and social functioning with consequences that may extend well into adulthood.^{5,14,15}**

Recognizing Broader Physical Health Harms

Nicotine affects the body beyond the brain. In the cardiovascular system, nicotine increases constriction of blood vessels and the heart's overall workload.^{4,11} These effects are particularly concerning when newer or poorly regulated products contain high doses of nicotine or other additives that may impact vascular functions and contribute to long-term cardiovascular risks.^{11,22} Nicotine use has also been linked to negative reproductive effects in males, including reduced sperm production, count, and motility, and may transiently impair insulin sensitivity, with repeated or chronic use potentially contributing to longer-term metabolic risks.¹² In addition to these systemic effects, oral

nicotine products can cause local harms, including irritation, oral lesions/plaques, and gum recession.^{7,11}

Creating Immediate Paediatric Poisoning Risks

Young children are vulnerable to accidental nicotine ingestion due to their low body weight and natural curiosity. Casual adult storage practices, together with flavoured, scented or candy-like products, increase the likelihood of mistaken ingestion.^{16,23} Accidental nicotine ingestion can present with nausea, vomiting, dizziness, weakness, confusion, and cough, with severe cases requiring medical attention or hospitalization.^{16,23} This risk was first recognized with nicotine-containing e-liquids; Canadian survey data documented multiple accidental ingestions among children under age 4 that resulted in emergency department assessment.²³ Nicotine pouches are presenting a similar threat, with U.S. poison-centre data showing that unintentional nicotine pouch ingestions among children under age 6 rose by more than 760% from 2020 to 2023, as these products became more widely available.¹⁶

Oral Nicotine Pouches: A Case Study in Product Design and Regulatory Risk

Oral nicotine pouches illustrate how product innovation can outpace necessary regulatory safeguards. Since entering the Canadian market in 2023, nicotine pouch use among young people has risen sharply. Data from the Ontario Tobacco Research Unit showed that 1 in 3 young Canadians reported ever using nicotine pouches^{9,24}—an increase of over 350% from 2022 to 2026²⁵—while another 2024 survey data showed nearly 30% of Canadian youth with past-month pouch use had never smoked cigarettes before. Globally, pouch users commonly include nicotine-naïve youth and concurrent users of vapes or cigarettes, challenging the positioning of these products as adult smoking cessation tools.^{6,7,11}

Pouches are discreet, easy to conceal, and placed between the gum and lip where nicotine is absorbed through the oral mucosa.^{1,6,7} Although this route of absorption is slower than inhalation, products can still deliver substantial doses of nicotine, with tested nicotine content varying

widely across brands.^{1,7,11} Product labelling is often difficult to interpret because strength may be reported per pouch, per gram, or through other nonstandard descriptors.^{6,26} Alarming, some pouches contain higher levels of known carcinogens called tobacco-specific nitrosamines (TSNAs) than strictly regulated nicotine replacement therapies²⁶, and manufacturers can modify formulations without further regulatory oversight to increase nicotine absorption and reduce unpleasant sensations, promoting initiation and repeated use.^{1,2,6,7}

Taken together, these characteristics highlight the risks posed by novel nicotine products and expose important gaps in Canada's current regulatory framework for oral nicotine products.

Products with comparable addiction potential should be subject to consistent, evidence-based safeguards regardless of nicotine origin or formulation. Importantly, in the absence of comprehensive, long-term safety data, this new route of youth nicotine exposure should not be misleadingly promoted as a simple “safer-than-cigarettes” alternative.^{6,7,11}

Nicotine Analogues: The Next Frontier

Emerging nicotine analogues are also often marketed as “safer” nicotine alternatives.^{9,10,25} One key analogue is **6-methyl nicotine (6-MN)**, a laboratory-created molecule produced by chemically modifying the nicotine molecule. The modification is modest—just enough to make the resulting molecule fall outside current chemical or legal definitions of nicotine. It has been marketed under names such as Metatine or Imotine, and often described as being “nicotine-free.”^{10,25} However, early evidence shows that 6-MN may actually bind to nicotine receptors more strongly than nicotine itself, suggesting that it can have similar physiological effects and carry similar or potentially greater addiction and toxicity risks.^{9,10,27} **Comprehensive, long-term safety data should be prerequisites to market promotion or product accessibility of nicotine analogues, especially to youth.^{9,10,25,27}**

Social media, misinformation, and youth appeal

Normalizing Nicotine as a Lifestyle and Male-Empowerment Product

Social media may amplify nicotine-related harm by making nicotine use appear desirable, routine, and low-risk.^{6,28,29} Recent studies of oral nicotine pouch content on TikTok, including content produced by “Zynfluencers,” suggest that products such as Zyn and Zonnic are often embedded in humour and lifestyle content as part of the “Zyn movement”—to be used after meals, at work, with friends—while rarely emphasizing addiction, poisoning, or other health risks.^{28,29} This content normalizes nicotine use and presents these products as socially rewarding, further challenging the intended use of pouches as cessation tools for adults.^{6,28–30}

A notable feature of this online misinformation environment is its specific appeal to young male audiences. Nicotine pouch content often integrates youth-oriented memes, challenges, sports culture, and masculine-coded humour.^{6,28,29} **The result is a digital environment framing nicotine use (and associated addiction risks) as a socially desirable identity symbol during a developmental period when adolescents are sensitive to peer approval, reward, and risk-taking.**^{5,6,14,15,28,29}

Promoting Misleading Benefit Claims

Misinformation also appears through claims that nicotine products improve focus, productivity, mood, stress, anxiety, or sensory pleasure—claims that are often unsubstantiated, exaggerated, or based on partial truths.^{28,30,31} **Similarly, terms such as “clean,” “natural,” “tobacco-free,” “smoke-free,” or “nicotine-free” can create misleading safety cues, especially when products still contain addictive nicotine, nicotine analogues, or poorly characterized ingredients.**^{6,10,29,30,32} For example, nearly 1 in 3 U.S. young adults believe alarming claims about nicotine products, such as nicotine is no more harmful than coffee.³¹

Trivializing Nicotine Poisoning

Social media content can also normalize acute nicotine toxicity, using terms such as “nic sick” to describe symptoms of nausea, vomiting, throat burning, headache, and fatigue during or after nicotine use.³³ **Many videos treat nicotine toxicity as humorous, dramatic, or part of a challenge, using the phrase “nic sick check” to encourage intentional overconsumption.**³³ Because platforms such as TikTok personalize content through algorithms, adolescents who engage with nicotine-related videos may be repeatedly exposed to similar content, normalizing these dangerous claims, and reducing perceived risk.^{28,33}

Young people deserve accurate, evidence-based information about nicotine, not misleading promotional content that exaggerates perceived health and social benefits while minimizing or omitting well established risks.^{6,28–30}

Conclusion

Canada should act now to ensure that novel nicotine-containing and nicotine analogue products are appropriately regulated before product innovation again outpaces youth protection. Strong, consistent, and evidence-based safeguards should address product content, formulation, accessibility, promotion, and digital marketing of novel nicotine-containing and nicotine-analogue products. Regulation must also address inaccurate health claims and the algorithmic amplification of nicotine-related misinformation.^{2,6,28–30,32,33} While well-regulated nicotine replacement therapies are necessary to support adult smoking cessation, the growing recreational use among youth and nicotine-naïve users raises serious concerns over unregulated and underregulated novel nicotine products entering the Canadian market.^{6,11,33} Canada’s experience with e-cigarettes underscores the consequences of regulatory delay and the importance of acting before, rather than after, emerging nicotine products become entrenched and contribute to widespread youth exposure and dependence.^{1,2,5,14}

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