

# Developing Brain & Substance Use Prevention

**Alison Haggerty, Health Promoter**

**Helen Risteen, Public Health Nurse (Secondary)**

# The Adolescent Brain



- The stereotypical ‘issues’ in adolescence have much more to do with the developing brain than they do with what we used to think of as ‘teen hormones’
- Significant changes continue from teen years right through the 20’s
- These “Neural Growth Pains” lead to a stronger, faster, more sophisticated brain in adulthood

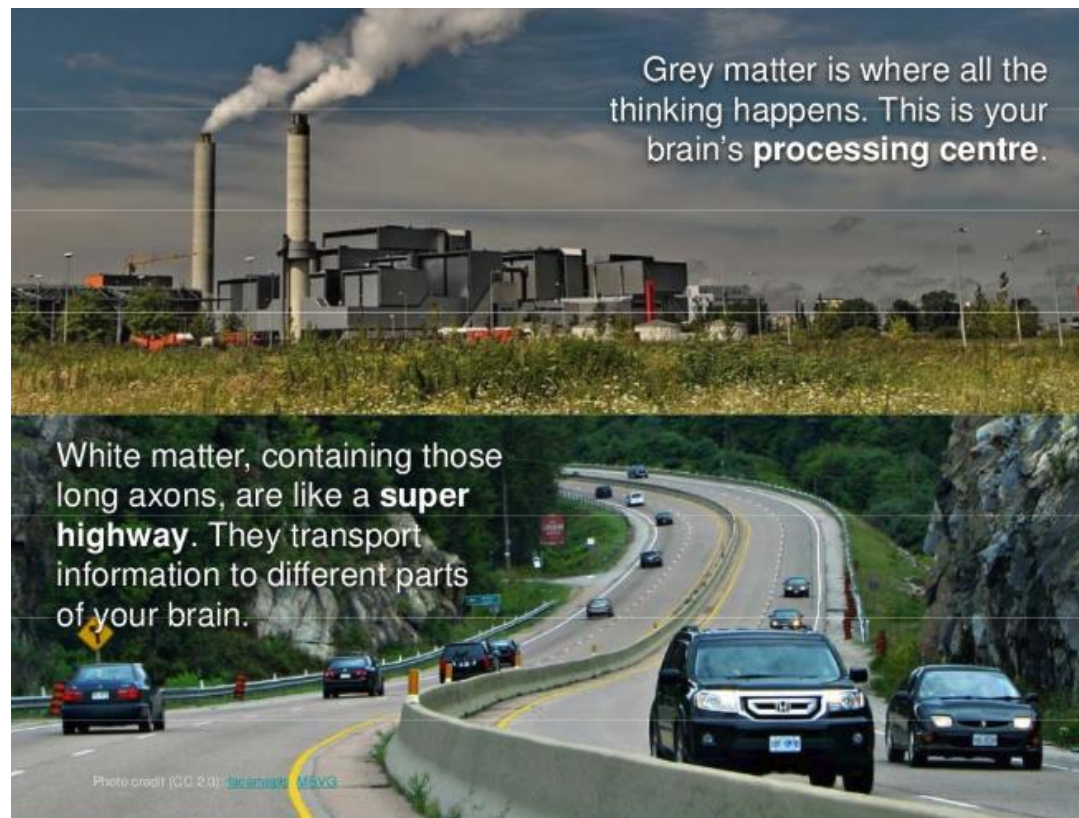
# Adolescent Brain Development

Adolescent brain development can be divided into three processes:

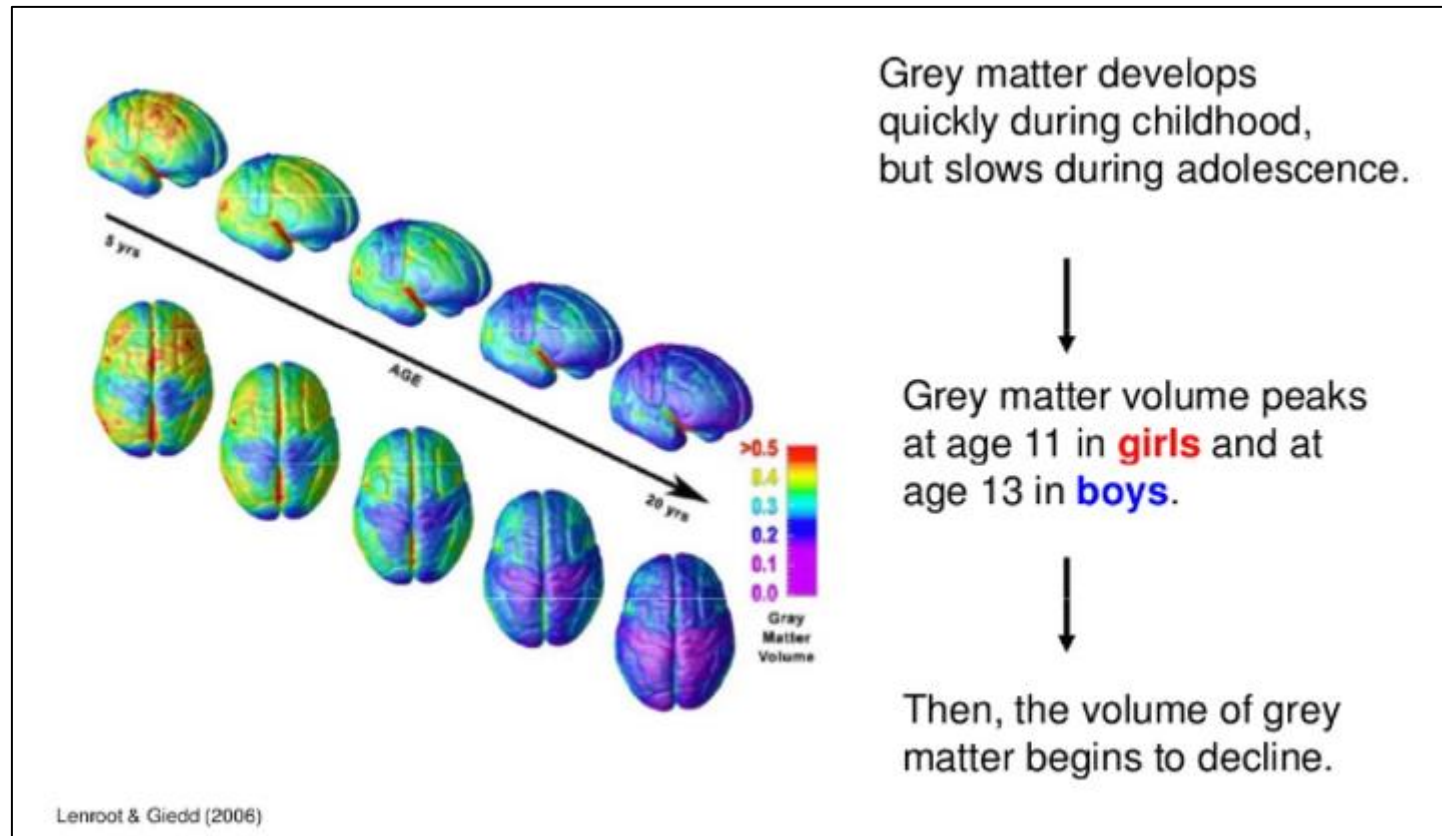
- **Proliferation** (rapid growth of brain matter and the formation of new connections within the brain)
- **Pruning** (cutting away of unused or unimportant connections)
- **Myelination** (insulating of brain pathways to make them faster and more stable)

(Sowell et al., 1999; Sowell et al., 2001)

# Grey and White Matter



# Proliferation: Grey Matter





# Teen Brain: Constantly Developing



- Some areas mature faster than others
- The areas associated with Reward, Motivation and Impulsivity mature early
- The Prefrontal Cortex matures later:
  - Logic
  - Impulse control
  - Control & organization of emotional reactions
  - Forming judgements

# Teens Are Poor at Reading Facial Expressions

- Adults correctly interpreted this expression as fear
- ½ teens thought it was anger, sadness, surprise or shock
- Adults use the rational Prefrontal Cortex
- Teens use the amygdala as their PFC is still a work in progress



# Risk vs. Reward Analysis

## Teens tend to:

- Overestimate the benefits of risky behaviours
- Underestimate the potential harms
- Reward system is “Supercharged”; it’s hypersensitive to the rewarding feeling of risk-taking in adolescence

Risk taking is not always a bad thing e.g. risk of asking your crush to the dance.



# Social Risk

Avoiding social risk might matter more to adolescents than avoiding other types of risk.



# Young people and addictions

Addictions started in adolescence are much more difficult to quit.

The younger and more often teens try drugs, the more likely they are to become addicted.

Effects of drugs are more pervasive and longer lasting.

Teens are far more likely to become addicted than adults in less time and with less 'dose'.



# Substance use risk and protective factors

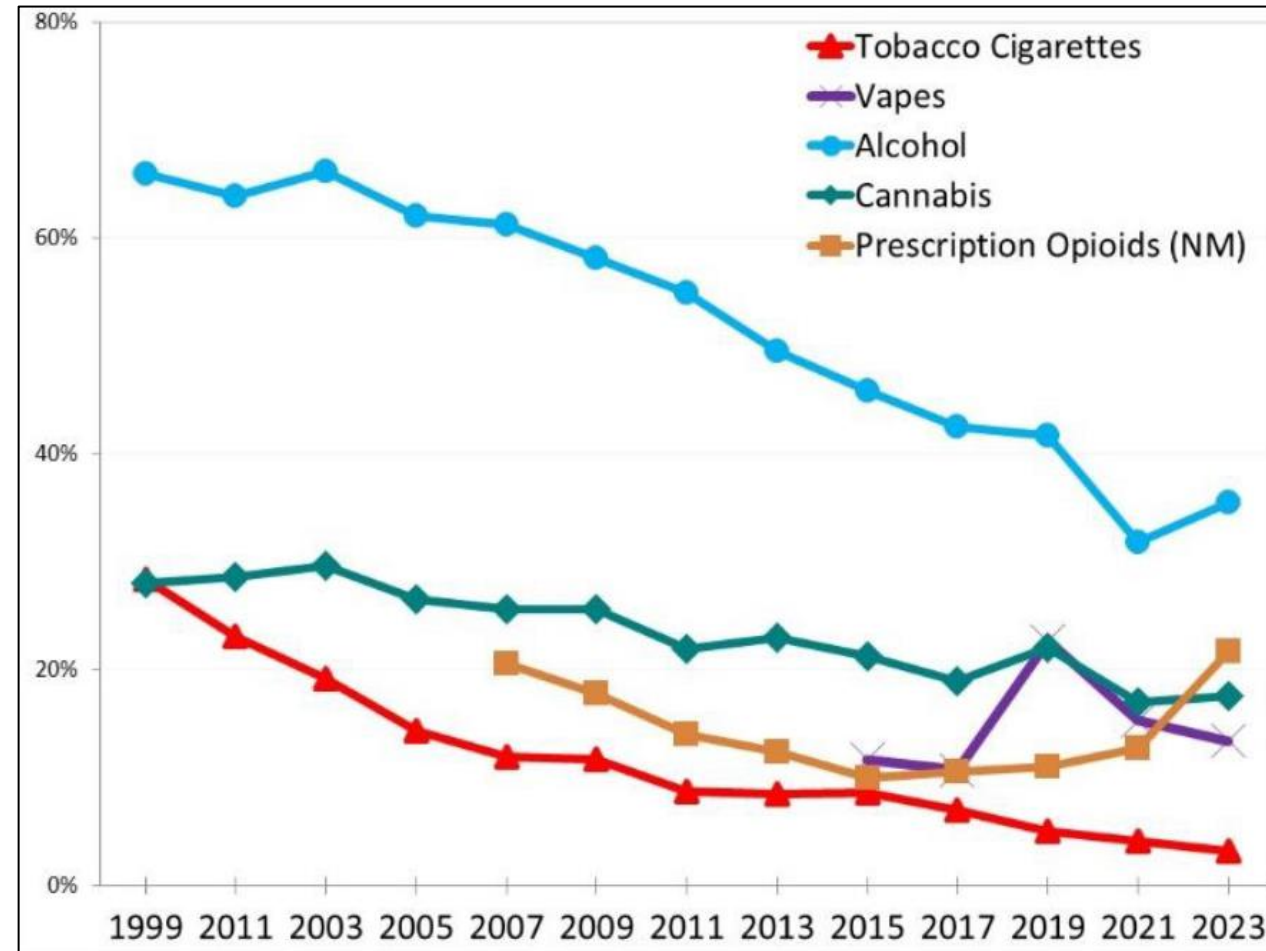
Risk factors	Protective factors
Genetics <ul style="list-style-type: none"><li>• Parents with a substance use disorder</li></ul>	Parent/family engagement
Trauma <ul style="list-style-type: none"><li>• Adverse childhood experiences (ACEs)</li></ul>	Family support
Mental health issues	Parental disapproval of substance use
Friends/community <ul style="list-style-type: none"><li>• Parental substance use</li><li>• Parental approval of their child's substance use</li><li>• Lack of parental monitoring</li></ul>	Parental monitoring
	School connectedness

# Reasons students use & don't use

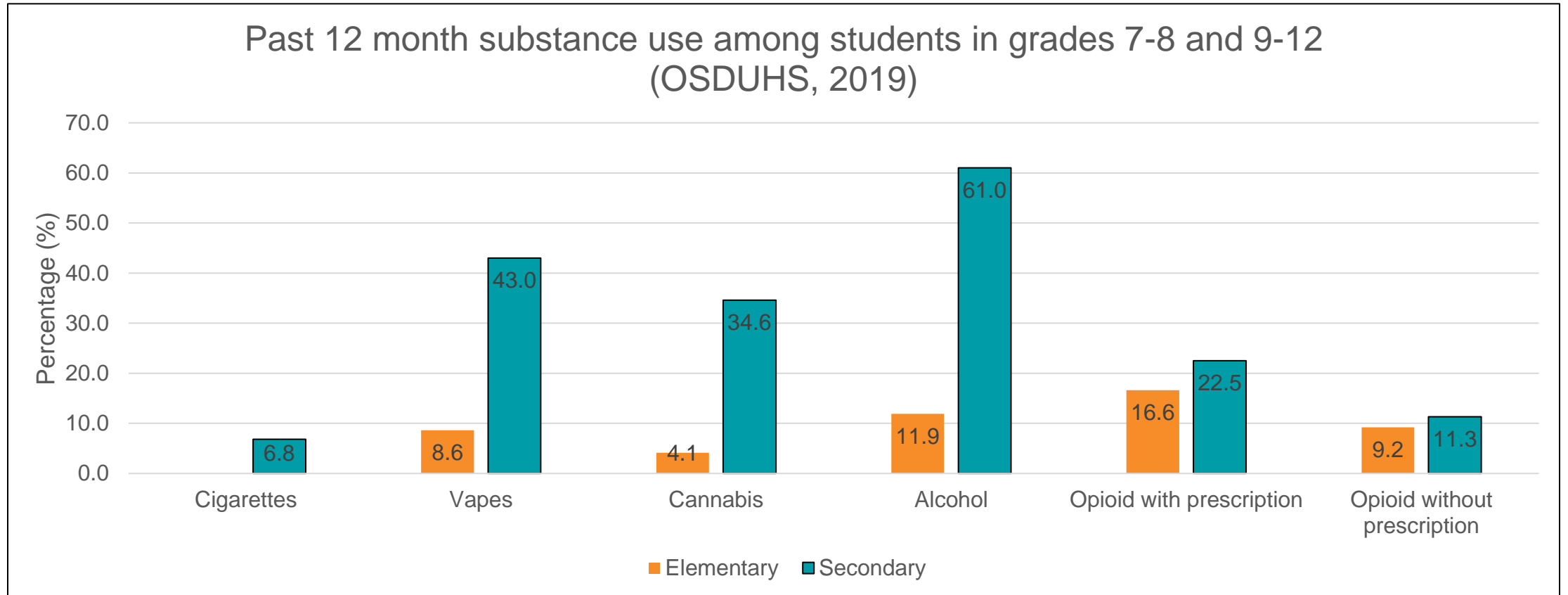
Reasons students <u>don't</u> use	Reasons students use
Family and peer influence	
Interested in other activities	Enjoyment
Physical and mental health	Wanting to fit in
Avoid negative consequences	Curiosity
Personal values and beliefs	Media influence
	Coping strategy
	Addiction



# % of students reporting past year drug use, 1999–2023 OSDUHS (Grades 7–12)



# Substance use among Niagara students





# Alcohol

# Alcohol and young people

- High risk of:
  - Injuries
  - Aggression and violence
  - Dating violence
  - Worsening academic performance
- Drinking alcohol at a young age is more harmful because it damages the developing brain
- Alcohol is often consumed in the form of binge drinking (drinking to get drunk)
  - 5 or more drinks on one occasion for males; 4 or more drinks on one occasion for females
- The younger a person starts drinking, the more likely they are to experience problems with alcohol and poor health



# Effects of alcohol use

Short-term effects	Long-term effects
Lowered inhibitions	Worsening academic performance
High risk of injuries	Addiction
Aggression and violence	Cancer
Dating violence	Cardiovascular disease
Hangover	Liver disease
Alcohol poisoning	And more!

**When it comes to alcohol, drinking less means less risk of harm. It is recommended that youth under the legal drinking age should delay drinking for as long as possible.**

# For those who choose to drink...

- Never combine drugs with alcohol
- Eat (but avoid salty snacks)
- Drink water between drinks
- Monitor how much you are drinking
- Avoid drinking games, funneling etc.
- Do not drive or operate equipment



# Cannabis

# The drug

- Legal ≠ safe for everyone
- Most common methods of using cannabis: smoking, edibles, vaporizing (vape pen), and oils
- Chemicals found in the cannabis plant are called **cannabinoids**

THC	CBD
<ul style="list-style-type: none"><li>• Responsible for the way the brain and body react to cannabis, including the “high”</li><li>• The higher the level of THC, the more harm it can cause to the body</li></ul>	<ul style="list-style-type: none"><li>• Does not cause a “high”</li><li>• CBD is sometimes used as a treatment for people that suffer with chronic pain</li></ul>



# Effects of using cannabis

Short-term effects	Long-term effects
Impairs your ability to drive safely or operate equipment	Harms lungs and makes it harder to breathe
Makes it harder to learn and remember things	Can become physically dependent or addicted
Affects mental health	

## What increases the risk of harm?

Using cannabis...

- At an early age
- Frequently
- In large amounts
- With other drugs
- Products with high THC content

**Youth are more vulnerable to the effects of cannabis. To protect their health, youth should not use cannabis.**

# Cannabis-related harms

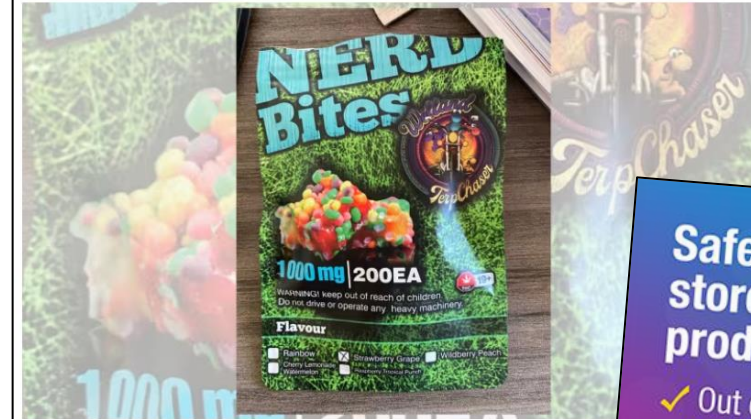
- Youth use cannabis more heavily and more frequently than other age groups
- Sharp spike in Ontario ED visits and hospitalizations for unintentional cannabis poisonings in children under 10
- Continuing to see illegal cannabis products circulating
- Rates of cannabis-related ED visits for traffic injuries in Ontario has increased
- Increased concerns about cannabis-induced psychosis from regular use as well as from high potency products

## Mother says package presenting cannabis like a 'treat' put children in hospital

Katrina MacDonald says son had to be rushed to Halifax emergency department



Michael Tutton · The Canadian Press · Posted: Mar 24, 2024 1:50 PM EDT | Last Updated: March 24



The mother of a nine-year-old boy says packaging that depicts highly potent cannabis as candy led to his and his classmates at a Halifax school to consume them. (HO-Katrina MacDonald/The Canadian Press)

**Safely and securely store your cannabis products:**

- ✓ Out of children's reach
- ✓ Away from food and drink
- ✓ In child-resistant packaging or a locked container



# For those who choose to use cannabis...

- Purchase legal, regulated cannabis from an authorized retailer
- Avoid using cannabis extracts with higher amounts of THC
- Do not drive or operate equipment



Edibles	Vape/Smoke
Look for products with 2.5mg of THC or less	Start with 1 or 2 puffs of a vape or joint with 10% (100mg/g) or less

# Vaping

# More youth are vaping

- Vaping has increased among students across all groups by gender, ethnicity and smoking status
- High proportion of youth that vape are using products that contain nicotine
- Issue of students vaping in schools
- Youth are more vulnerable because brain and body are still developing
- Youth who vape tend to use other substances like alcohol and cannabis (polysubstance use)



# Effects of vaping

Short-term effects	Long-term effects
Light headedness	Limited research on the safety and long-term health effects. Possible lung damage.
Throat irritation/coughing	
Lung inflammation and worsens asthma	Any product containing nicotine is addictive and can lead to physical dependence
Dizziness	
Increased heart rate and blood pressure	
Reduces impulse control	
Affects mental health	

**If you don't smoke, don't vape. Vaping may be less harmful than cigarettes, but safer does not mean safe, especially if someone has never smoked.**



# For those who choose to vape...

- Choose vape cartridges with less nicotine and work on decreasing with time
- Only use vaping devices that have been authorized for sale in Canada
- Do not make changes to the product
- Follow the instructions for use specific to your vaping device

# Other substance use

# Opioid use is on the rise

- Nonmedical use of prescription opioid pain relievers among Ontario students in grades 9-12 significantly increased from 12.7% in 2021 to 21.8% in 2023 (OSDUHS, 2023)
- Rates of fatal and non-fatal opioid toxicity have increased substantially over the past decade in Ontario among those ages 15-24
- Fentanyl and fentanyl analogues are now widely present in the unregulated opioid supply



**Risks**

**Niagara's drug supply is unpredictable and toxic**

Niagara has one of the highest rates of opioid-related deaths per capita in the Province

Fentanyl is now commonly laced with other sedative drugs such as benzos and tranks making it more challenging to reverse overdose using Naloxone

**Always call 911 if someone is experiencing an overdose**

# Nicotine pouches (Zonnic/Zyn)

- Nicotine pouches containing various levels of nicotine (2mg, 4mg or more)
- Products can be purchased at gas stations and convenience stores (no age restriction)
- Products owned by the Tobacco companies
- Products do not need to abide by advertising regulations like tobacco/vaping and cannabis products

## 'We were duped': Health minister vows to close 'loophole' on flavoured nicotine pouches

The product hit shelves last month with no regulations on advertising or sales to youth



Marina von Stackelberg · CBC News ·

Posted: Nov 30, 2023 12:22 PM EST | Last Updated: November 30, 2023



# Levels of use and warning signs

# Levels of substance use

Level of use	Key features
Non-use	Never used a drug
Experimental	Curious about effects of drug; used several times
Irregular/Occasional	<ul style="list-style-type: none"><li>• Infrequent use; special occasion</li><li>• When opportunities are available</li></ul>
Regular	<ul style="list-style-type: none"><li>• Regular use</li><li>• Seeks opportunities to use drug(s)</li><li>• Friends are “doing it”</li><li>• Feels “in control” of drug use</li></ul>
Dependent (Addiction)	<ul style="list-style-type: none"><li>• Physiological and psychological dependence</li><li>• Craving</li><li>• Loss of control of amount or frequency of use</li><li>• Compulsion to use</li><li>• Use despite consequences</li></ul>



# Warning signs of substance use

- Changes in behaviour
- Gradual withdrawal from social circles
- Drop in grades
- Loss of interest in normal activities

## **Four C's of addiction:**

- Craving (four C's)
- Control – loss of control of amount or frequency of use
- Compulsion to use
- Consequences – use despite consequences

# Navigating conversations

# Talking to your child about substances

1. Focus on health and brain science, not morality
2. Early, frequent and ongoing conversations about drugs are necessary
3. Today's drug landscape is not the same as when you were a teen: it's changing and it's more complex
4. Talk about how their brains work: addiction is a disease of the brain and teens are at risk
5. Substance use disorders do not discriminate: anyone can become addicted
6. Even if you think you know all the signs, you probably don't (signs of drug use can vary)
7. YOU can make a difference - parents play a key role in substance use prevention

# Communicating Rules

Rules must have reasons

1. To keep them safe
2. To prepare them to navigate a world full of rules

Make sure teens understand why we set rules

- We love them
- To ensure they live within safe and moral boundaries

Set clear expectations for risky behaviours

Determine non-negotiables



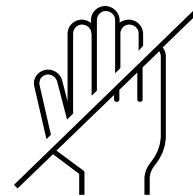
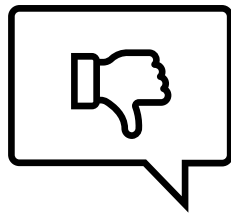
# Setting your teen up for success

- Identify risky situations
- Prepare in advance
- Talking about concerns and risks
- Identify risk reduction strategies



# Practice refusal skills

1. Just say "No"
2. Suggest an alternate activity
3. Leave the situation
4. Reverse the pressure
5. Use humor
6. Ignore the offer
7. Give an excuse
8. Pass the blame
9. Pull in help
10. Change the subject



# Many parents have an amnesty policy

## **With an agreed Amnesty Policy your teen:**

- Can seek assistance from you without fearing consequences
- Can call you and ask for your help

You will guarantee that in those moments you will not impose regular consequences such as a punishment. Instead, you will focus on getting them out of harm's way.

When the time is right, you will discuss the incident and express how proud you are for your teen to have contacted you instead of making a wrong choice.



# Handling misbehaviours

**Heart:** your feelings; describe the strengths you see in them.

**Belly:** explain why you are concerned. Make it clear you fear their choices may prevent them from reaching their full potential.

**Head:** solves problems: remain calm; tell them you want to work together to find solution. Let your teen be the expert in their own life.

**Hands:** to guide: Ask how you can best support them.

# Emergency situations

# When to get help

**If you notice the following signs in someone who has used substances, you need to get help immediately.**



- Being unresponsive, but awake
- Limp body
- Seizures
- Slow or erratic pulse
- Difficulty breathing
- Choking
- Blue fingernails or lips
- Pale or clammy face
- Loss of consciousness

# Emergency situations

**If someone passes out after using any substances, try to wake them up. If they don't respond, do the following:**

- Check for a pulse
- Make sure the person is breathing
- Use the Bacchus Maneuver
- Stay with the person and **call 911**
- Notify parents or guardians as soon as possible
- Never leave the person alone!



**Stay with the person and monitor closely.**

# Good Samaritan Drug Overdose Act

- Applies to anyone seeking emergency support during an overdose, including the person experiencing an overdose
- Protects the person who seeks help, whether they stay or leave from the overdose scene before help arrives
- Protects anyone else who is at the scene when help arrives

# Resources and supports

# Supportive people

- Parent or caregiver
- Trusted adult or elder
- Teacher
- Principal
- Health care provider
- School Health Nurse
- Counselor or therapist





# Parent resources

- [Drug Free Kids Canada](#)
  - [Drug spotlights](#)
  - [Age-appropriate conversations](#)
  - [Talking about substances if you've used them](#)
- [Not An Experiment \(vaping\)](#)
- [Consider the Consequences \(vaping\)](#)
- [Get Sensible \(cannabis\)](#)
- [National Institute on Drug Abuse](#)  
\*U.S. based (all substances)
- [Rethink Your Drinking](#)



# Substance use support

## Smoking/vaping:

- [Quash Mobile App](#): Download free app (for 14-30 year olds)
- [Health 811](#): Call 811 to speak to a Quit Care Coach
- [Not an Experiment - Quit Plan](#)
- [Smokers Helpline](#): Text iQuit to 12345
- [STOP Vaping Challenge Mobile App](#): Download free app

## Other substances:

- [CASON \(Community and Addiction Services of Niagara\)](#)
- CCSA Knowing your limits: A practical guide for assessing your substance use
  - [Cannabis](#)
  - [Alcohol](#)
- [savemylife.ca](#)



# Q & A