

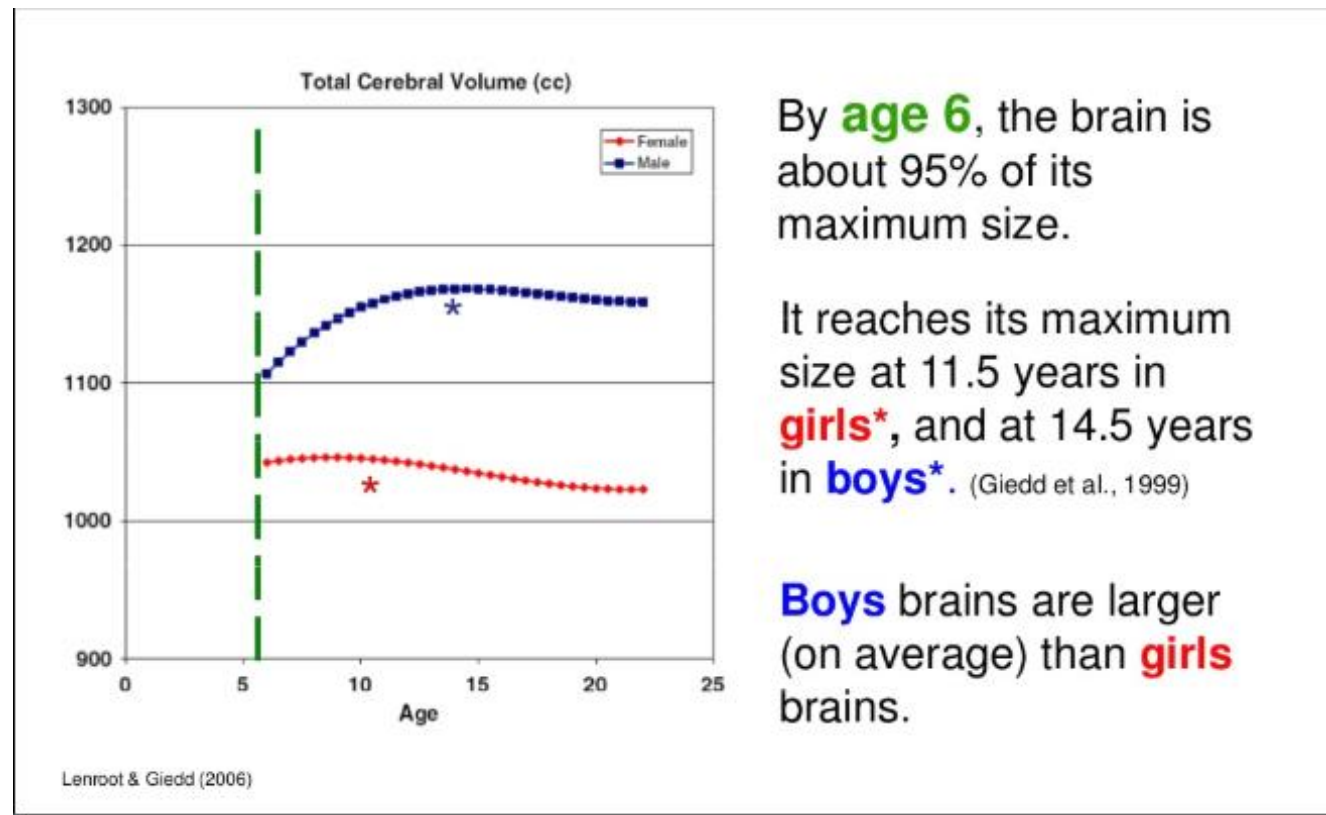
Adolescent Brain & Substance Use Prevention

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The Adolescent Brain

- The stereotypical ‘issues’ in adolescence have less to do with ‘hormones’ and much more to do with the developing brain
- Significant changes continue from teen years right through the 20’s
- “Neural Growth Pains” lead to a stronger, faster, more sophisticated brain in adulthood

Brain Size: Not the Whole Picture



Adolescent Brain Development

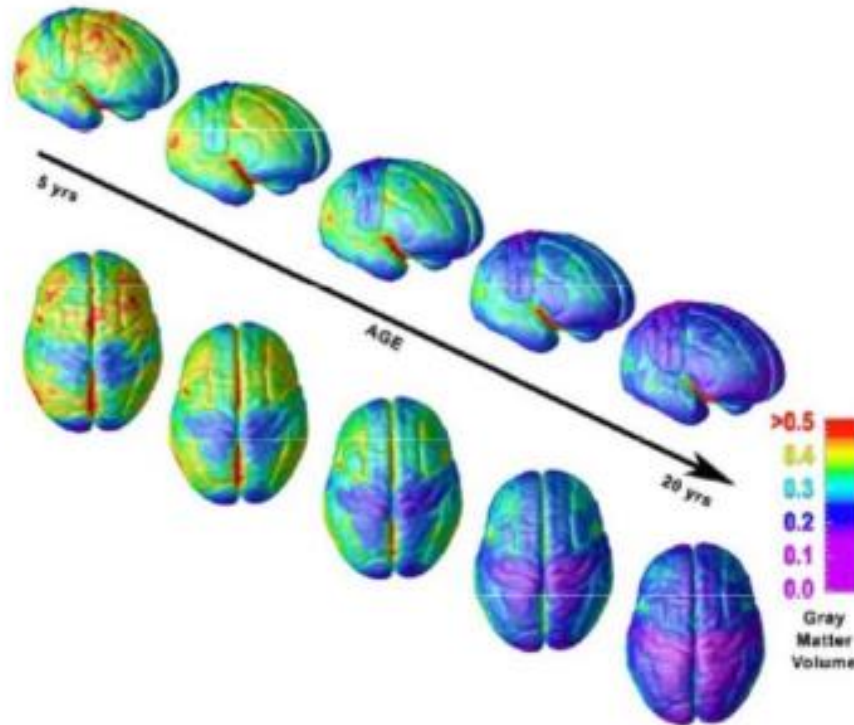
Adolescent brain development can be divided into three processes:

- **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



Grey matter develops quickly during childhood, but slows during adolescence.



Grey matter volume peaks at age 11 in **girls** and at age 13 in **boys**.



Then, the volume of grey matter begins to decline.

Lenroot & Giedd (2006)

Teen Brain: Constantly Developing

- The Prefrontal Cortex matures later
 - Logic
 - Impulse control
 - Control & organization of emotional reactions
 - Forming judgements

Teen Brain: Constantly Developing

- Some areas mature faster than others
- The areas associated with reward, motivation and impulsivity mature early

What emotion is this woman feeling?

Teens 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

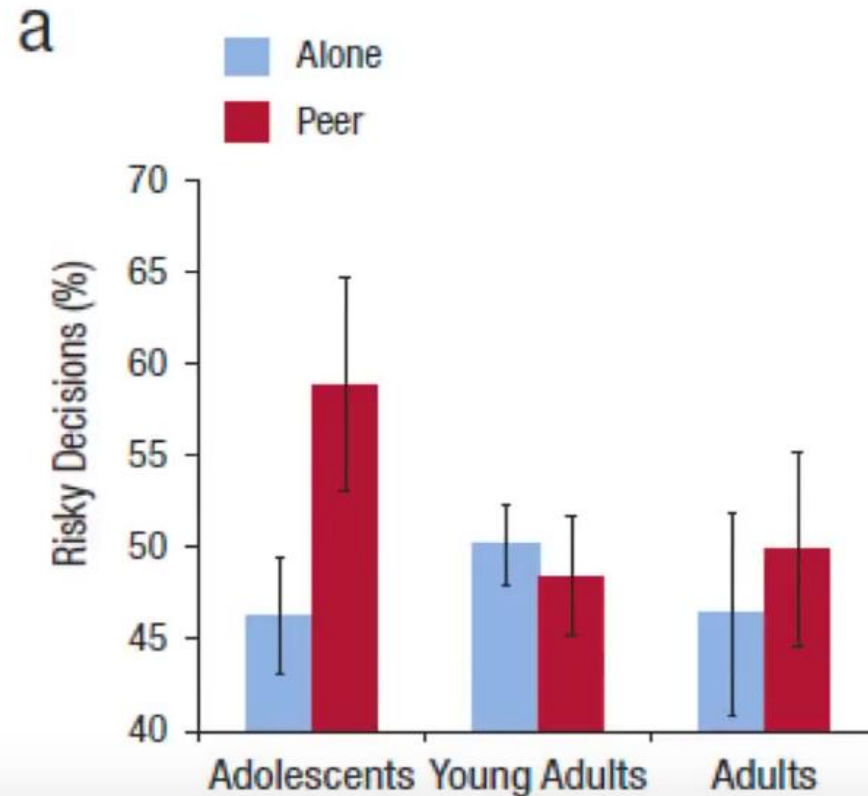
Risk vs. Reward Analysis

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

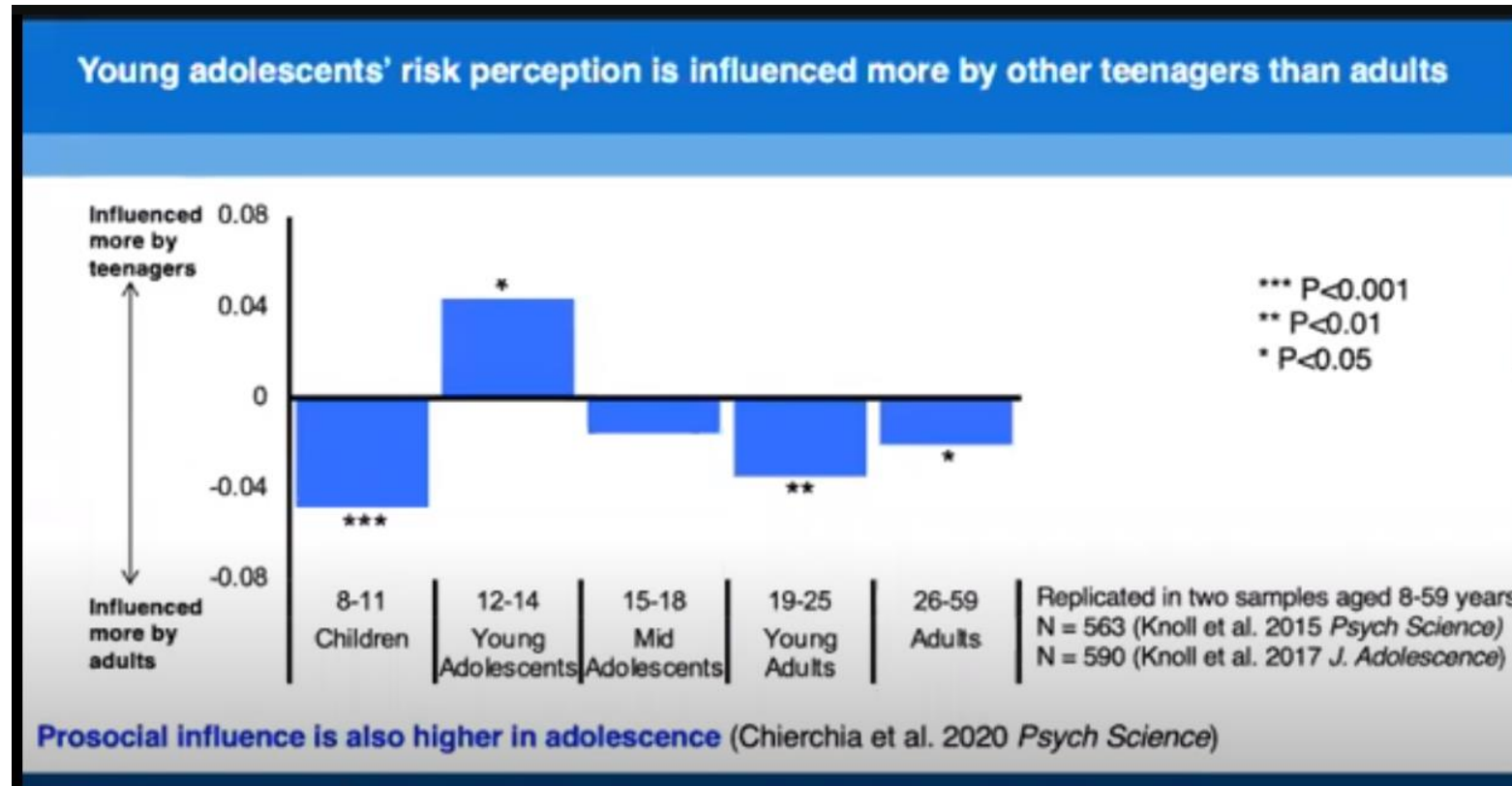
Peer Influence on Decision Making



Albert et al (2013) *The teenage brain: Peer influences on adolescent decision making*

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Social Influence on Risk Perception Experiment



Social Risk

Avoiding social risk

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



Blakemore & Mills (2014) *Annual Review of Psychology*
Blakemore (2018) *Current Directions in Psych Science*
Bonell et al (2019) *The Lancet Child & Adolescent Health*
Andrews et al (2020) *Trends in Cognitive Sciences*

Menti

Alcohol

Alcohol and young people

- Leading cause of death and social issues
- High proportion of alcohol is consumed in the form of binge drinking (drinking to get drunk)
- May be more affected by alcohol due to smaller physical size and having less of the liver enzyme that breaks down alcohol
- More vulnerable because brain and body are still developing
- 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!

Key messages

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.

If you drink...

- Never combine drugs with alcohol
- Eat (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">• Responsible for the way the brain and body react to cannabis, including the “high”• The higher the level of THC, the more harm it can cause to the body	<ul style="list-style-type: none">• Does not cause a “high”• CBD is sometimes used as a treatment for people that suffer with chronic pain

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 (brain is still developing)
- Frequently
- In large amounts
- With other drugs like alcohol and tobacco
- Products with high THC content

Key messages

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

If you 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

Vaping and young people

- Vaping continues to be on the rise among youth and young adults
- High proportion of youth that vape are using products that contain nicotine
- More vulnerable because brain and body are still developing
- In Niagara, almost 40% of secondary school aged youth reported no risk or slight risk of vaping (OSDUHS, 2019)

Nicotine and the teen brain

- Nicotine is a highly addictive chemical which can interfere with healthy teen brain development
- Can affect memory and concentration
- Can reduce impulse control
- Addictiveness is based on:
 - Nicotine concentration
 - Flavouring
 - Type of device
 - Brand

Effects of Vaping

Short-term effects	Long-term effects
Light headedness	There's limited research on the safety and long-term health effects. Some studies suggest possible lung damage. Any product containing nicotine is addictive and can lead to physical dependence
Throat irritation/coughing	
Asthma exacerbations in teens	
Dizziness	
Increased heart rate and blood pressure	
Lung inflammation	

Vaping and Mental Health Concerns

- Can contribute to depression or low mood
- Headaches
- Problems with falling and/or staying asleep
- Changes in appetite
- Problems with memory and concentration

Key message: if you don't smoke, don't vape

Teens 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'

Parenting Tips

- It's important to have open, ongoing conversations with our teens about drugs, so they will see you as an ally instead of an authoritarian: you're on the same side.
- We've got some tips and tricks to help navigate this time.

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

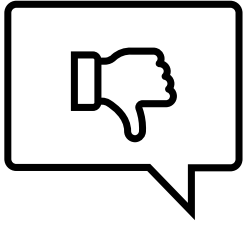
Determine non-negotiables

Talking to your kids about substance use

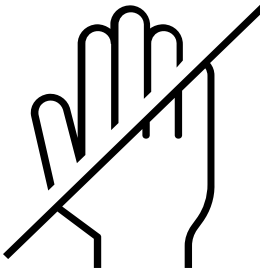
- Find the right moment
- Keep an open mind
- Put yourself in your teen's shoes
- Be clear about your goals
- Be calm and relaxed
- Be positive
- Be patient and ready to listen
- Set a positive example
- Don't lecture
- Find a comfortable setting
- Be aware of body language
- Get support
- Keep the conversation going

Setting Your Teen Up For Success

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



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.

How to Handle Misbehaviours

Heart: your feelings; 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.

Parent resources

- Drug Free Kids Canada
- Not An Experiment/ Parent Page
- Consider the Consequences (Health Canada)

[Keep Talking - 30sec - YouTube](#)



Substance use support

Smoking/vaping:

- [Smokers Helpline](#): Text iQuit to 12345
- [Quash Mobile App](#): Download free app (for 14-30 year olds)
- [STOP Vaping Challenge Mobile App](#): Download free app
- [Health 811](#): Call 811 to speak to a Quit Care Coach

Other substances:

- [Community and Addiction Services of Niagara \(CASON\)](#)
- savemylife.ca

School Nurses



- Every school has a School Health Nurse from NRPH
- The School Nurse role varies from elementary to secondary schools
- The supports range from school-wide support with programs, curriculum, and health initiatives, to one-on-one type supports for students regarding topics such as sexual health and relationships, stress and coping, smoking and vaping cessation, and connecting with community services
- If your teen feels that they would benefit from connecting with their school nurse, they can contact them either through their school administrators, or directly by texting/calling their work cell phones, (which can be found on the posters around the school).

Q & A