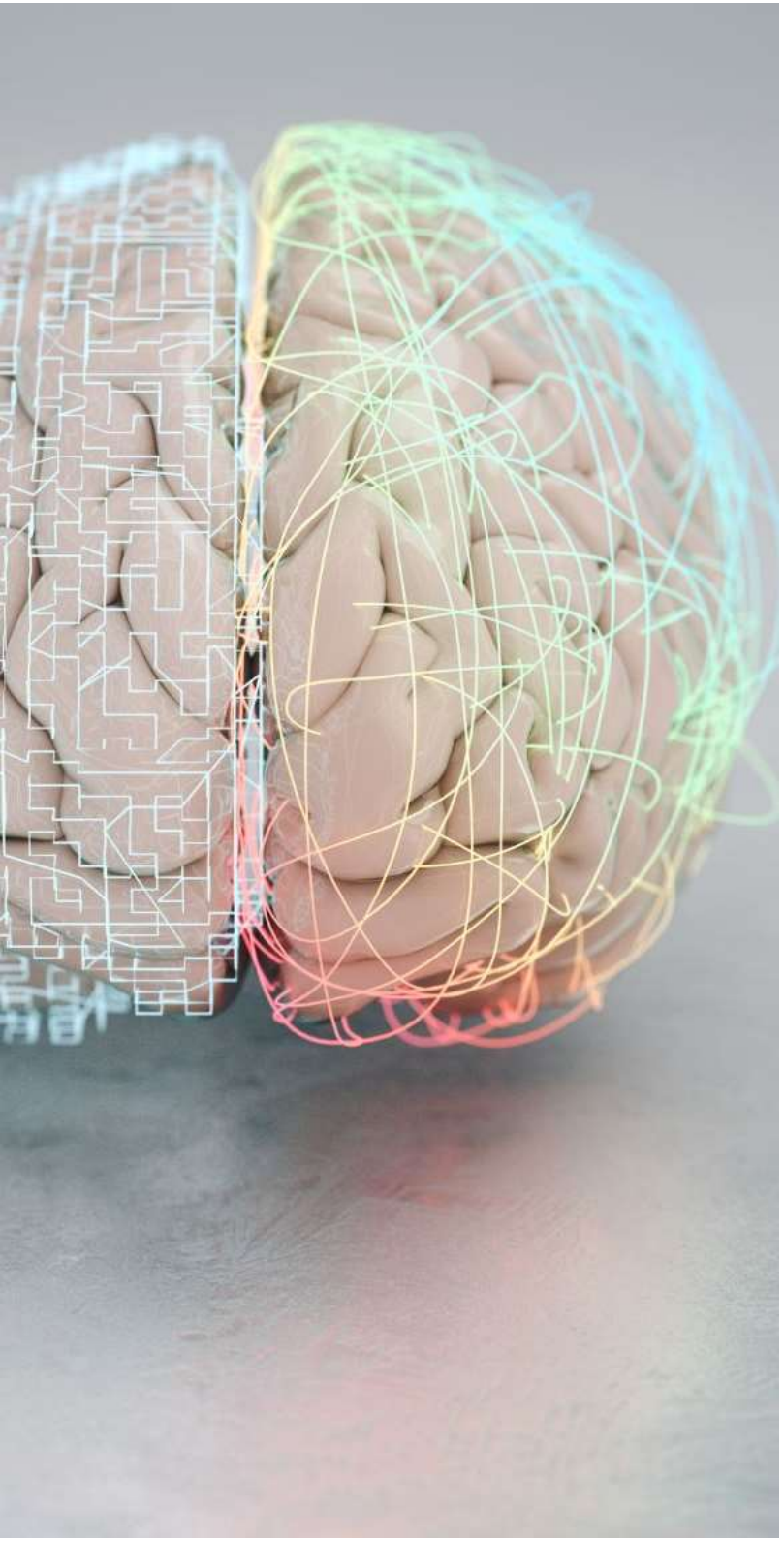
BELMATT
HEALTHCARE TRAINING

Understanding the teenage brain



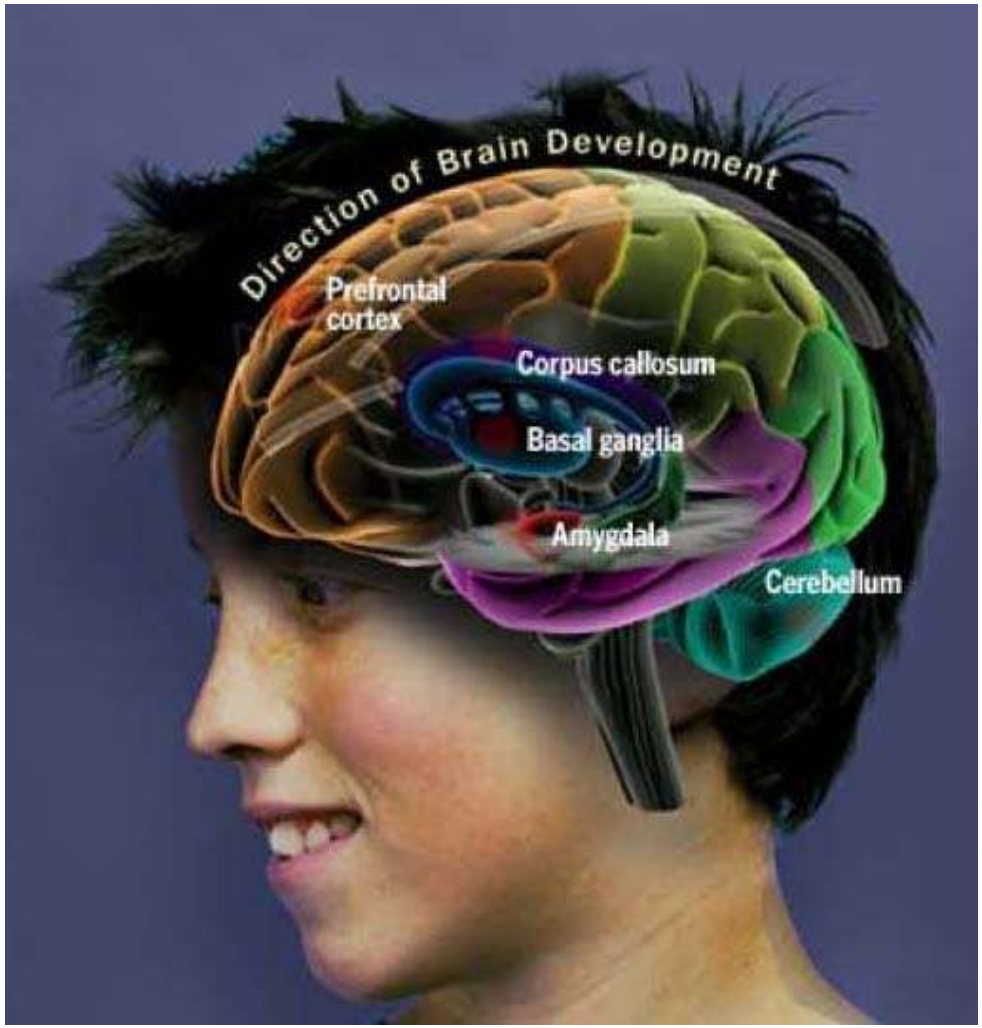
Learning Objectives

This session will develop your skills in :

- Broadening understanding of how the developmental level of the adolescent brain impacts moodiness, impulsivity, and poor decision-making ability
- Understanding the effects of brain Changes
- Recognise available resources and what we can do to intervene

A teenager's brain "has a well-developed accelerator but only a partly developed brake."

Laurence Steinberg



Outline

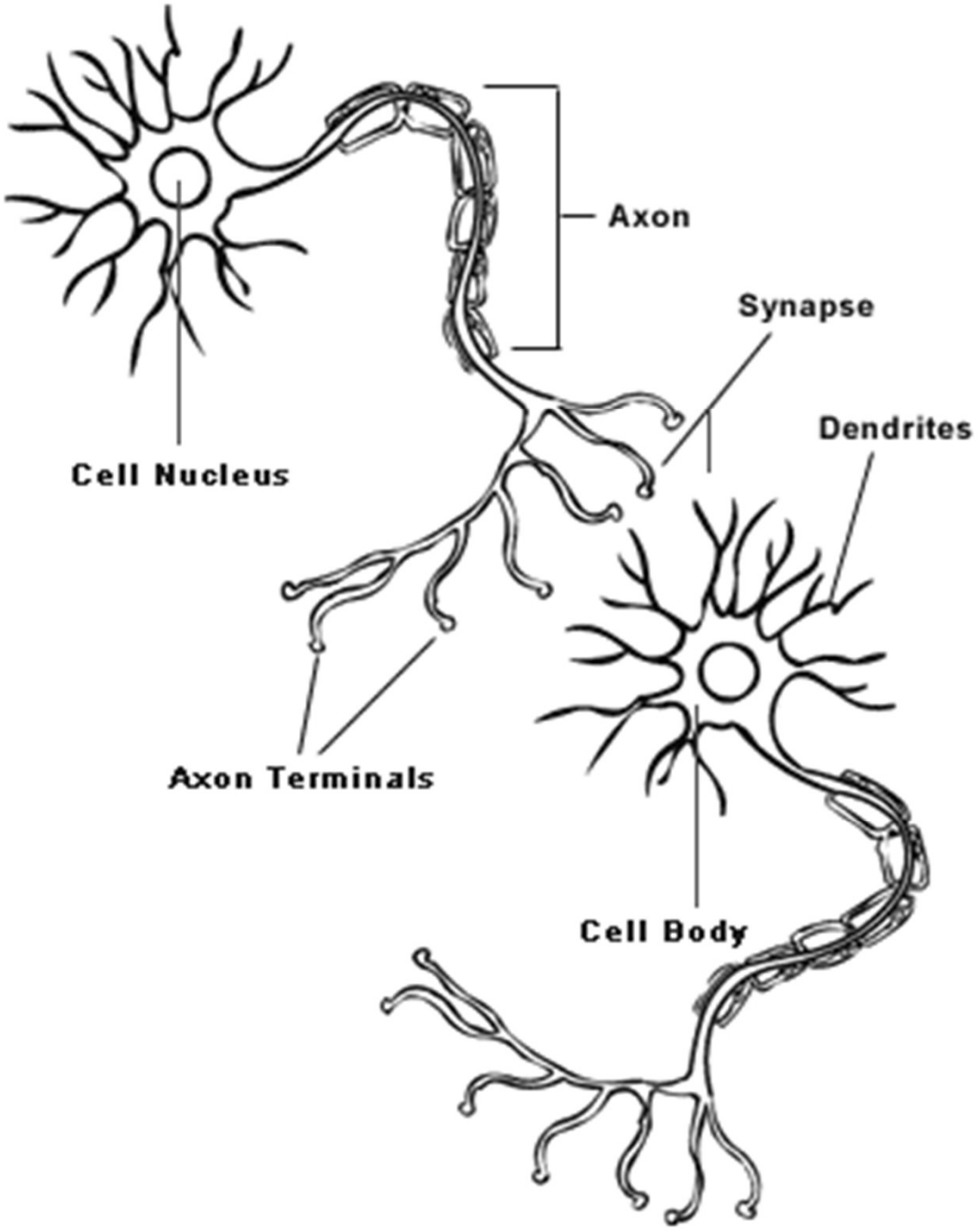
- Adolescent brain development
- Effects of the brain changes
- What we can do

Adolescent Brain Development

Significant changes in brain connections take place during different stages of adolescence:

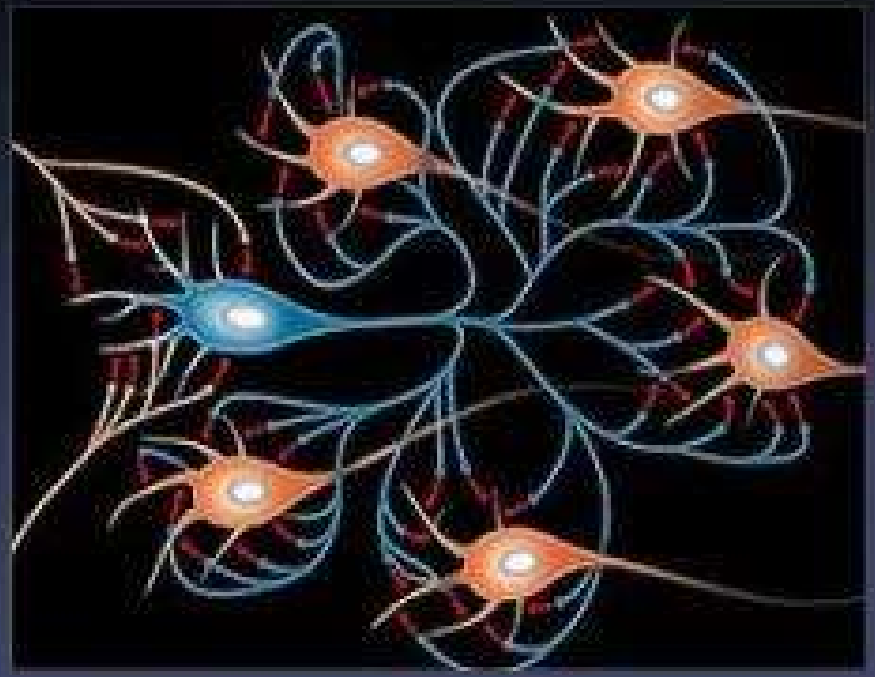
- Proliferation (10-12 years)
  - Rapid growth of brain matter and the formation of new connections
- Pruning (16-17 years)
  - Cutting away of unused or unimportant connections
- Myelination (late adolescence into adulthood)
  - Insulation of brain pathways to make them more efficient

Adolescent Brain Development



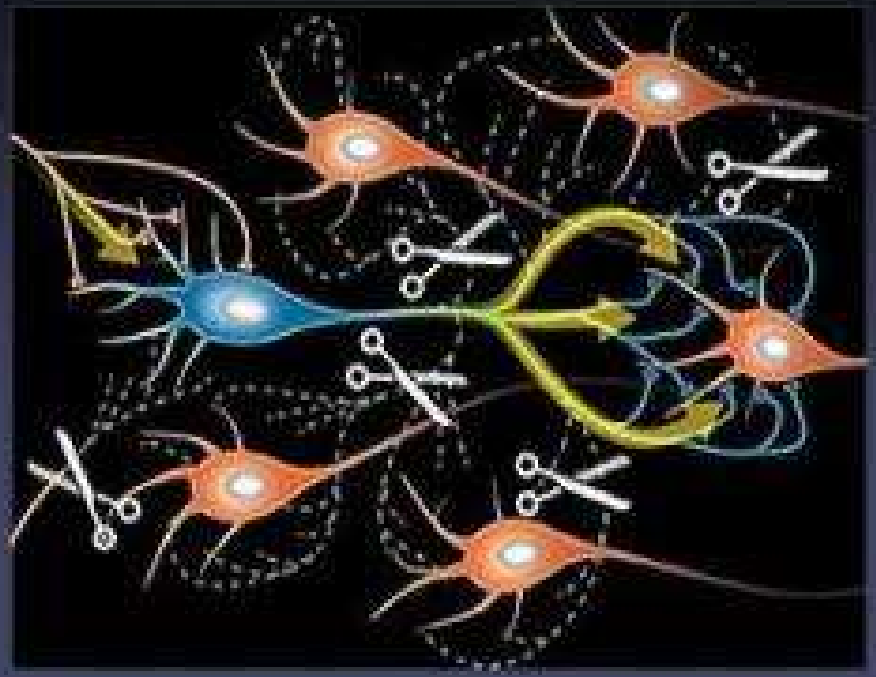
Nerve Proliferation...

- By age 11 for girls and 12 for boys, the neurons in the front of the brain have formed thousands of new connections. Over the next few years most of these links will be pruned.



...and Pruning

- Those that are used and reinforced — the pathways involved in language, for example — will be strengthened, while the ones that aren't used will die out



« PREVIOUS

NEXT: Gray Matter »

Adolescent Brain Development

- Different parts of the brain develop at different rates
  - ‘Emotional/pleasure’ part (limbic system) of the brain develops before ‘logical/decision-making’ part (pre-frontal cortex)
- Gender differences
  - Increase in brain matter earlier for girls
  - ‘Systemising brain’ vs. ‘empathising brain’
  - Sex hormones
- Adolescent brains are more sensitive to:
  - Dopamine: produced when risks are taken
  - Oxytocin: linked to social rewards

Discussion

What effects do you think the changes in brain development would have on young people?

Consider impact on:

Learning, behaviour, social and emotional development

What are The Effects of These Changes?

Slower processing speeds/providing response, processing errors

Ability to read emotions and think things through can be affected – more reactive to situation, use of emotions rather than being rational

Behaviour likely to be inconsistent: - they lack experience and are still learning to use their brains' new networks

Need more sleep - 9¼ hours and critical for memory and learning

Stress, tiredness & challenge can cause misfire "neural gawkiness"

Brains very adaptable (to environment) and capable of huge amount of learning

What are The Effects of These Changes?

- Thrill seeking and risk taking behaviours
  - Can be positive and negative
  - Motivated to seek out new experiences, people, learning & environments
  - Exploration; finding new interests and passions
  - Excitement of the world - innovation, creativity
  - Dopamine influences the experience of ‘thrill’ and pleasure
  - Need greater risk to experience same level of dopamine
  - Can be socially mediated

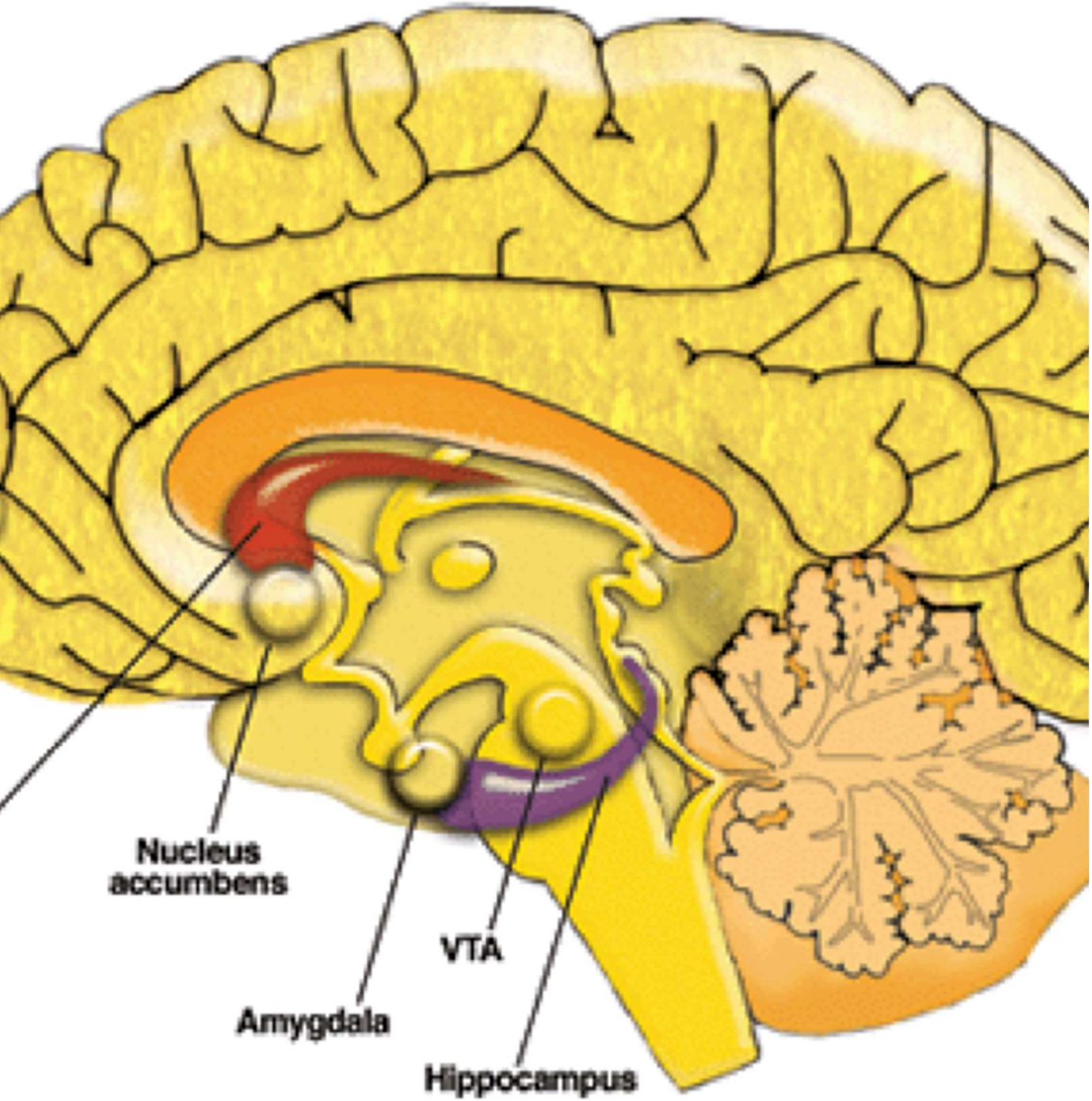
What are The Effects of These Changes?

- Alcohol and drugs
  - Increased sensitivity in adolescence – body and brain
  - Longer term addiction issues can begin in adolescence
  - Dis-inhibitor
  - These are not the pathways you want to reinforce!

Based on the stage of their brain development, adolescents are more likely to:

- Act on impulse
- Misread or misinterpret social cues and emotions
- Get into accidents of all kinds
- Get involved in fights
- Engage in dangerous or risky behaviour

- Scientists have identified a specific region of the brain called the **amygdala** that is responsible for immediate reactions including fear and aggressive behavior. This region develops early. However, **the frontal cortex**, the area of the brain that controls reasoning and helps us think before we act, develops later. This part of the brain is still changing and maturing well into adulthood.
- Other changes in the brain during adolescence include a rapid increase in the connections between the brain cells and making the brain pathways more effective. Nerve cells develop myelin, an insulating layer that helps cells communicate. All these changes are essential for the development of coordinated thought, action, and behavior.



The Accelerator Vs. The Brake

- **Prefrontal Cortex**: Directs our judgment & decision-making (rational, mature thinking)
- **Amygdala**: Directs our emotional response (immaturity)
- **Delay, Deny, Discourage!**

USE IT OR LOSE IT PRINCIPLE

- Pruning (Apoptosis) clears out unneeded wiring to make way for more efficient and faster information-processing (thicker myelin)

Prefrontal Cortex Thinking: Executive Function Skills

- Abstract; conceptual understanding
- Impulse Control
- Problem-Solving
- Decision-Making
- Judgment
- Emotion Regulation
- Frustration Tolerance
- Ability to Feel Empathy

What is Amygdala Thinking?

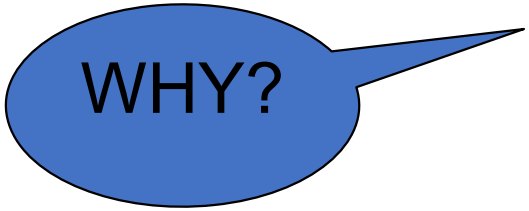
- Fight, Flight, Freeze Survival Mode
- All or Nothing: Concrete
- Based on fear or anger reactions
- Ignited by real or perceived threats
- Begins adrenaline cycle

What DOES This Mean?

- Adolescents on average are more:
- Impulsive
- Aggressive
- Emotionally volatile
- Likely to take risks
- Vulnerable to peer pressure
- Likely to overlook alternative courses of action
- Prone to focus on & overestimate short-term payoffs and underplay longer-term consequences of what they do

Students who wait to use drugs or alcohol until age 21, are likely NEVER to have problems with addiction during their lifetime.

Students who have a genetic predisposition to addiction and wait to use until age 21, are 40% less likely to have problems with addiction.



SAMSHA, 2012

- How do high-risk behaviors such as **substance use** impact teens choices to engage in other high-risk behaviors such as **bullying**?

Bullying- Why it Matters

As reported in the EHS survey data from the 2014—2015 school year, bullying does occur in various ways, most notably in the form of **social**, **emotional** and **verbal** bullying.

Bullying and High Risk Behaviors

- Kids are often pressured or bullied into using illegal substances.
- Young people want to fit in. Peer pressure is the biggest influence on underage drinking.
- Lack of psychosocial maturity greatly impacts the power and influence of bullying and peer pressure


Unsafe Sex
Depression
Rape & Violence
Bullying
Drunk Driving
Self-harm
Alcohol & Drugs

What does all this mean to you?

- **Do you think parents are justified in being their teen's prefrontal cortex until it is fully developed?**
- **Do you think teens underestimate the negative consequences of high-risk behavior? Why?**
- **When do you step in when reports of bullying have occurred?**

What are the effects of these changes?

- Stress
  - Adolescence as a time of “upheaval, storm and stress”
  - Brain changes, different responses to stress
  - Body changes
  - Social pressures and social media
  - Lack of sleep

What can we do?

More gentle (less confrontational) approach to discussing emotions, 'you look as if…', *I'm going to say something and I want you to tell me if I have got this right and if not you can tell me what I should have said.*

Manage miscommunications by modelling self-talk, e.g. *'let's think',* and engaging in a containing and thoughtful dialogue *'I didn't really understand/hear/listen to what you were saying – could you just tell me again about …'*

What can we do?

Help	Help recognise strengths/abilities – give positive feedback and encouragement
Model and encourage	Model and encourage a 'growth mindset' in which problems are useful, skills take time to develop and practice is everything
Time	Great time to learn new skills and info (use it or lose it!) – support to find out where interests/passions lie, e.g. BGE/extra-curricular activities
Promote	Promote secure attachments– adolescents value opinion of adults, especially 'significant others'
Encourage	Encourage independence – development of being an individual/sense of self

What can we do?

- Support development of pre-frontal cortex:
  - Talk through choices/problem solving options, e.g. '*what would you do if…?'* as a dialogue
  - Structures around planning/prioritising, e.g. study plan
- Discuss facts, e.g. alcohol/drugs, discuss potential risks/rewards – balance of these
- Encourage healthy sleep patterns
- Encourage relaxation

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