

# Adolescent Brain Development



**DENVER HEALTH**™

— est. 1860 —

**FOR LIFE'S JOURNEY**

Responding to Trauma and Building  
Resistance

# Objectives

- Adolescent brain development
  - Normal
  - Abnormal
- Building resistance



# What's happening up there?

- Early Childhood
  - Building connections
  - Learning lots of good things
- Adolescence
  - Pruning and reorganizing
  - Still learning and building



# Introduction



- <http://bit.ly/2tWg8qb>

# The developing teen brain





# Adolescence is a vital phase

- Adolescence is an essential stage of life and its developmental characteristics are a natural part of the way the brain is changing



# Teen Bingo



# Adolescent brain development

- Children's brains have a massive growth spurt when they're very young. **By the time they're six, their brains are already about 90-95% of adult size.**
  - But the brain still needs a lot of remodeling before it can function as an adult brain.
- This **brain remodeling happens intensively during adolescence**, continuing into your child's mid-20s.
- So even though all teenagers' brains develop in roughly the same way at the same time, there are **differences among individual teenagers.**
  - For example, a child who started puberty early will have some of the brain changes earlier



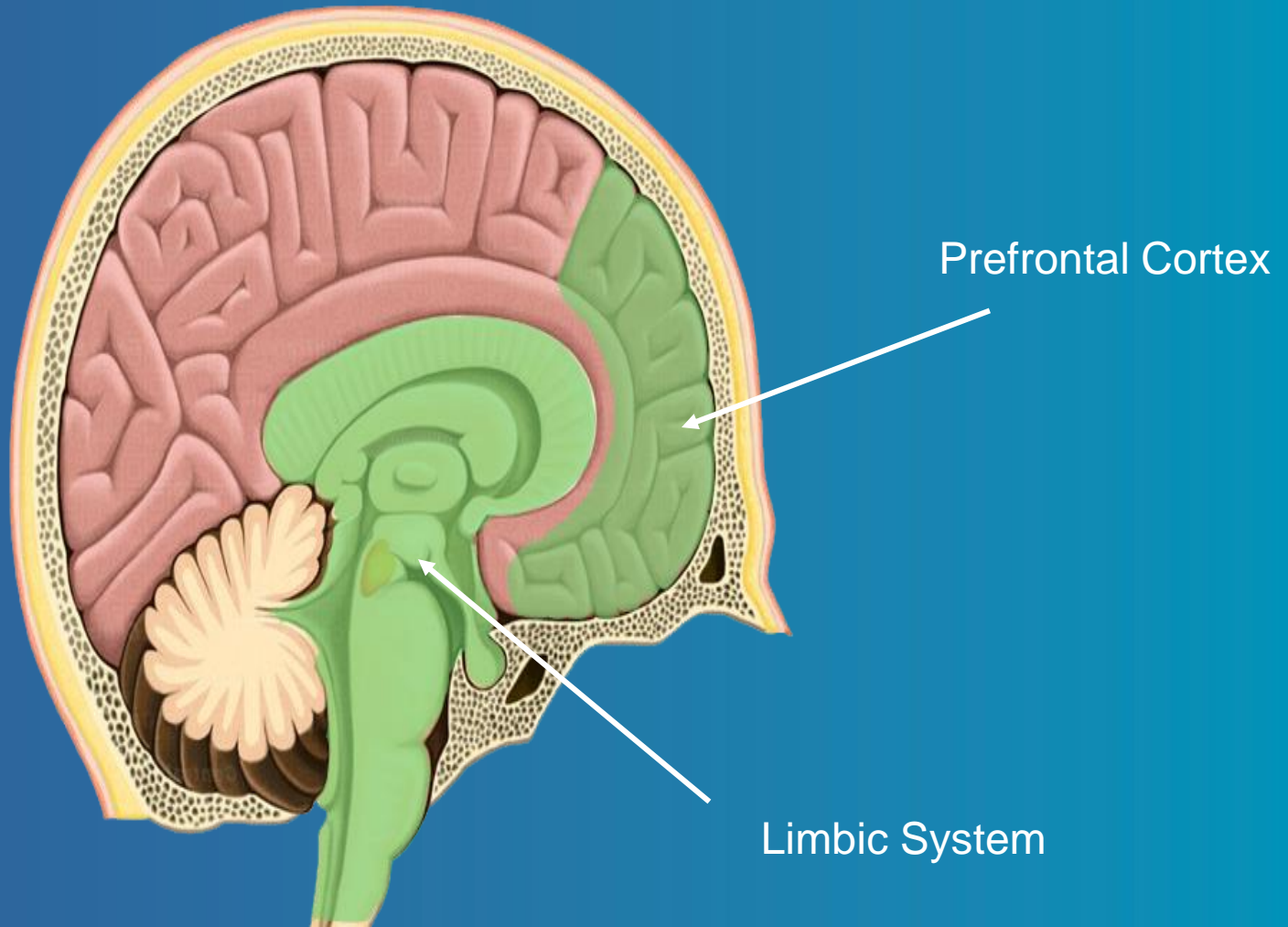
# Inside the Teenage brain

- Adolescence is a time of significant growth and development inside the teenage brain.
- Unused connections in the grey matter are **'pruned' away**. At the same time, other connections are strengthened.
- This pruning process **begins in the back of the brain**. The front part of the brain, the prefrontal cortex, is remodeled last.

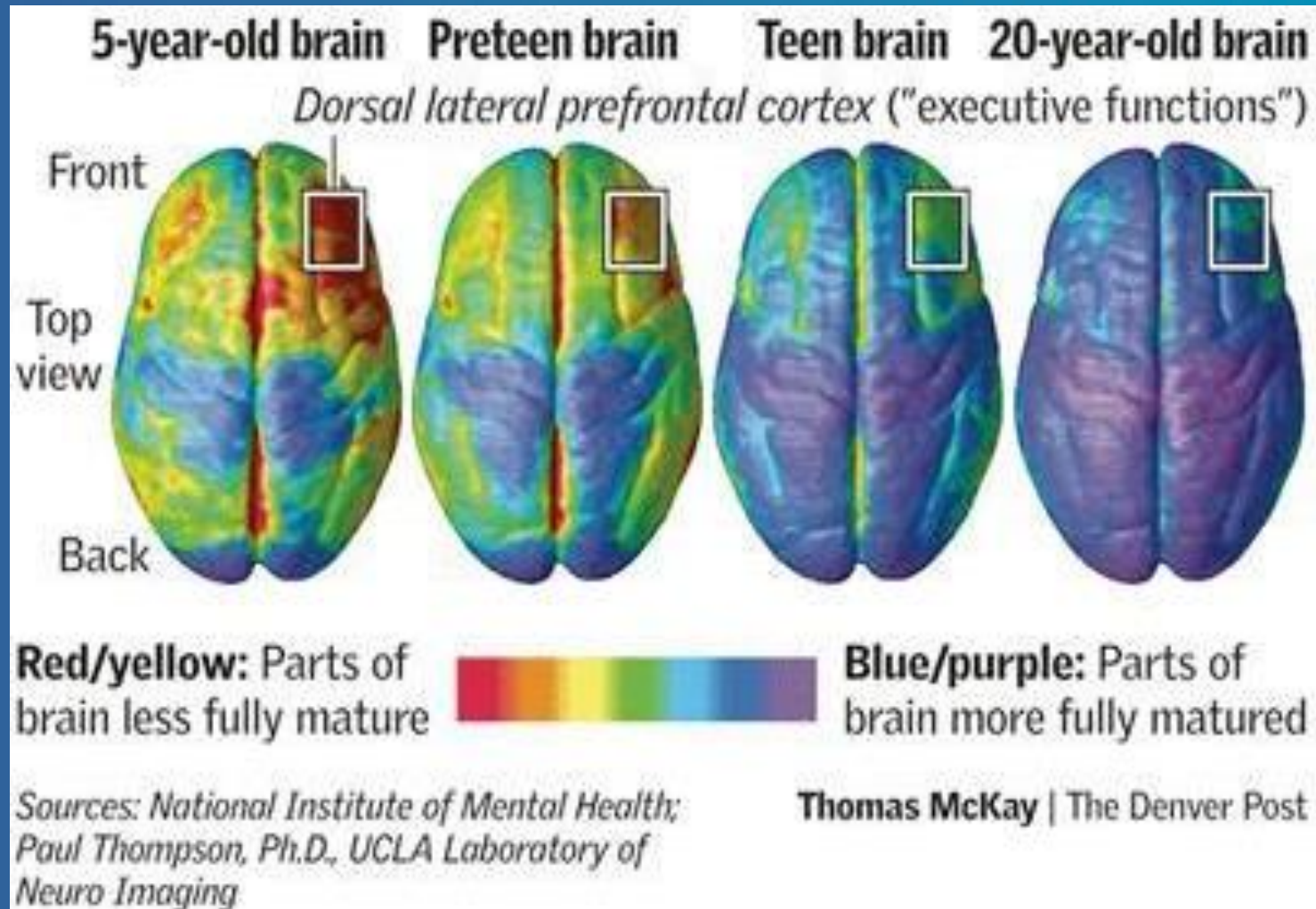
# What is happening developmentally?

- **Adjusting to Physical Changes**
- **Adjusting to Sexually Maturing Body & Feelings**
- **Develop and Applying Abstract Thinking Skills**
- **Defining a Personal Sense of Identity**
- **Adopt a Personal Value System**
- **Renegotiate Relationships with Caregivers**
- **Develop Stable and Productive Peer Relationships**
- **Meet demands of Increasingly Mature Roles & Responsibilities**

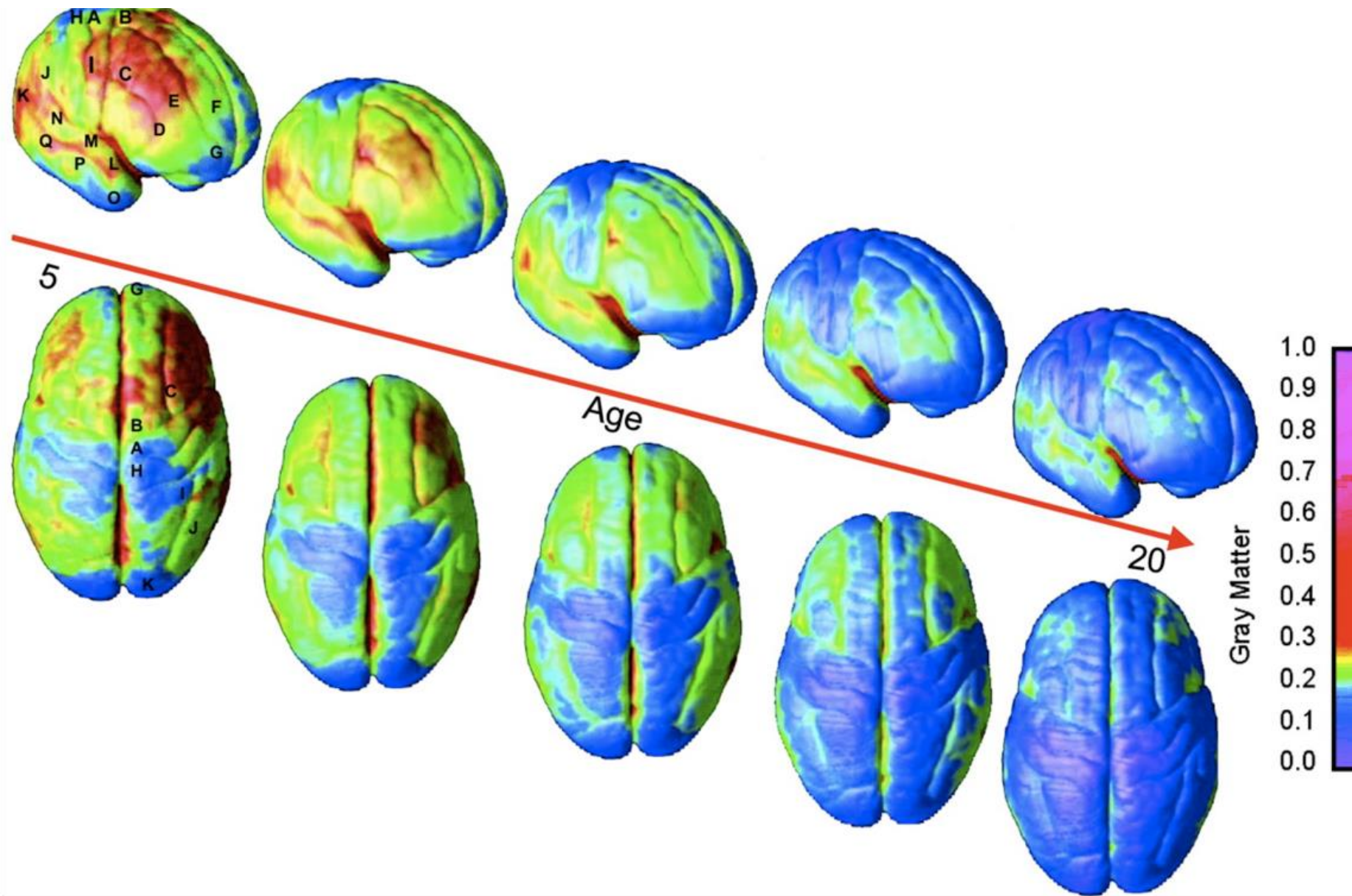
# Brain development



# Brain development



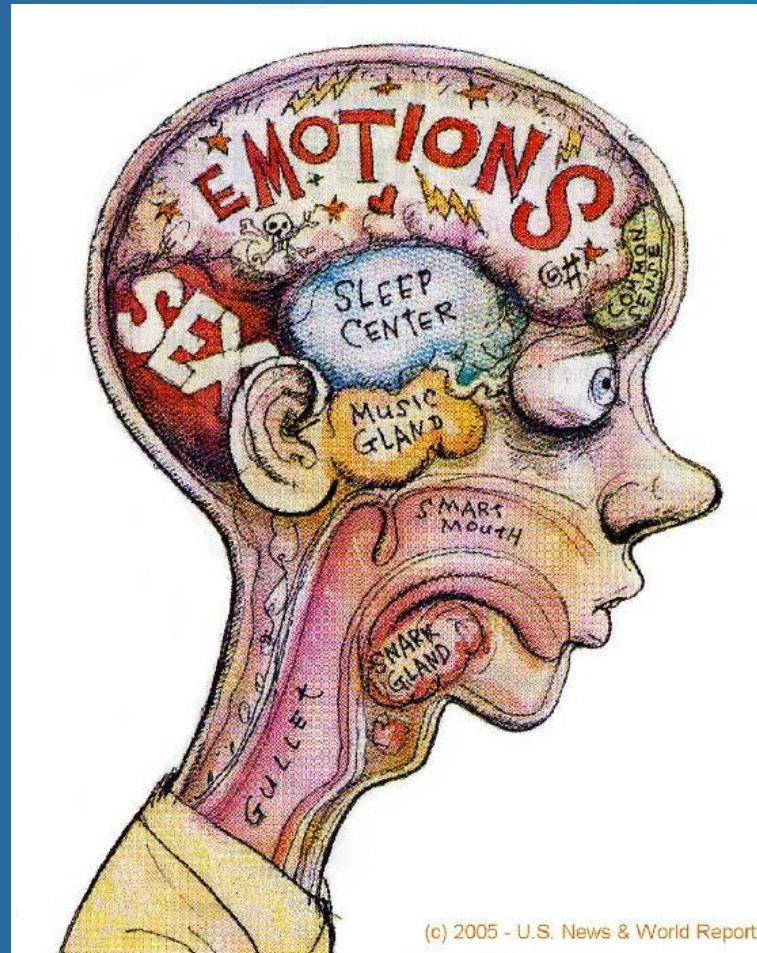


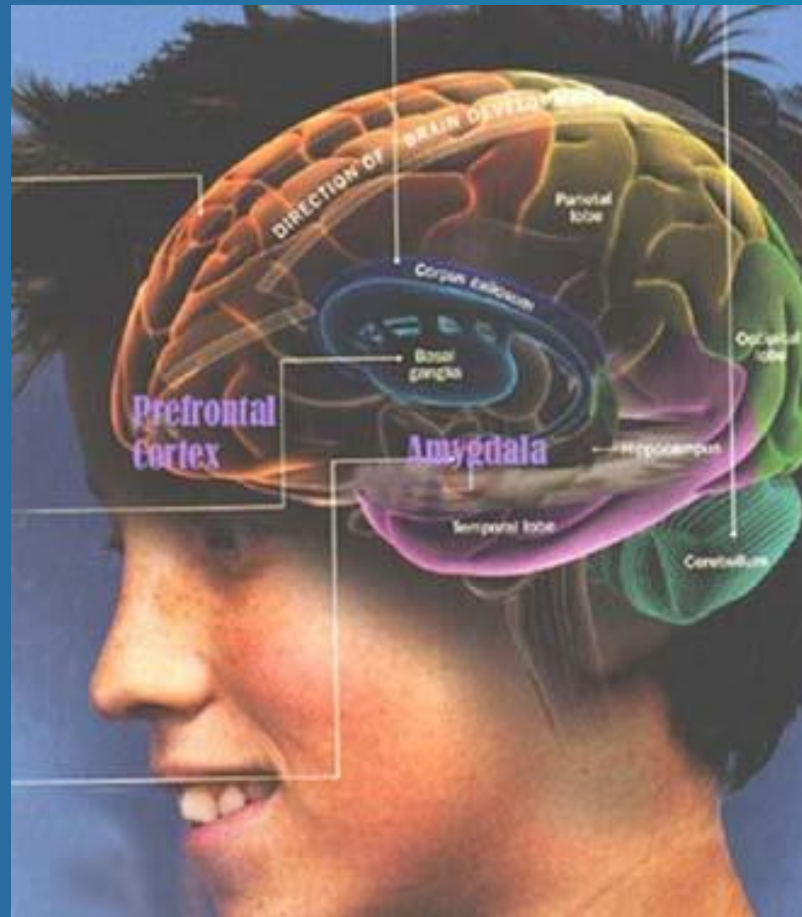


Gogtay et al. (2004), *Proc Natl Acad*



# Emotions and Feelings Dominate





# Prefrontal cortex

- Reasoning ability
- Goal and priority setting
- Ability to make sound judgments
- Planning and organization of multiple tasks
- Impulse inhibition
- Self-control
- Emotional control
- Determining right from wrong
- Determining cause and effect

# Amygdala

- **Very emotional part of the brain – Fear, Pleasure**
- **Aggression, impulsive, and risky behavior- survival instincts**
- **Helps to store memories of events and emotions**

# The Teen Brain

**Increase in reward drive = More emphasis on benefit than risk**

**Increase in emotional reactions – “Fly off the handle”**

**Increase in social engagement/acceptance**



**Increase in Risk Taking!**



# Developmentally appropriate behaviors



# DEVELOPMENTALLY APPROPRIATE BEHAVIORS

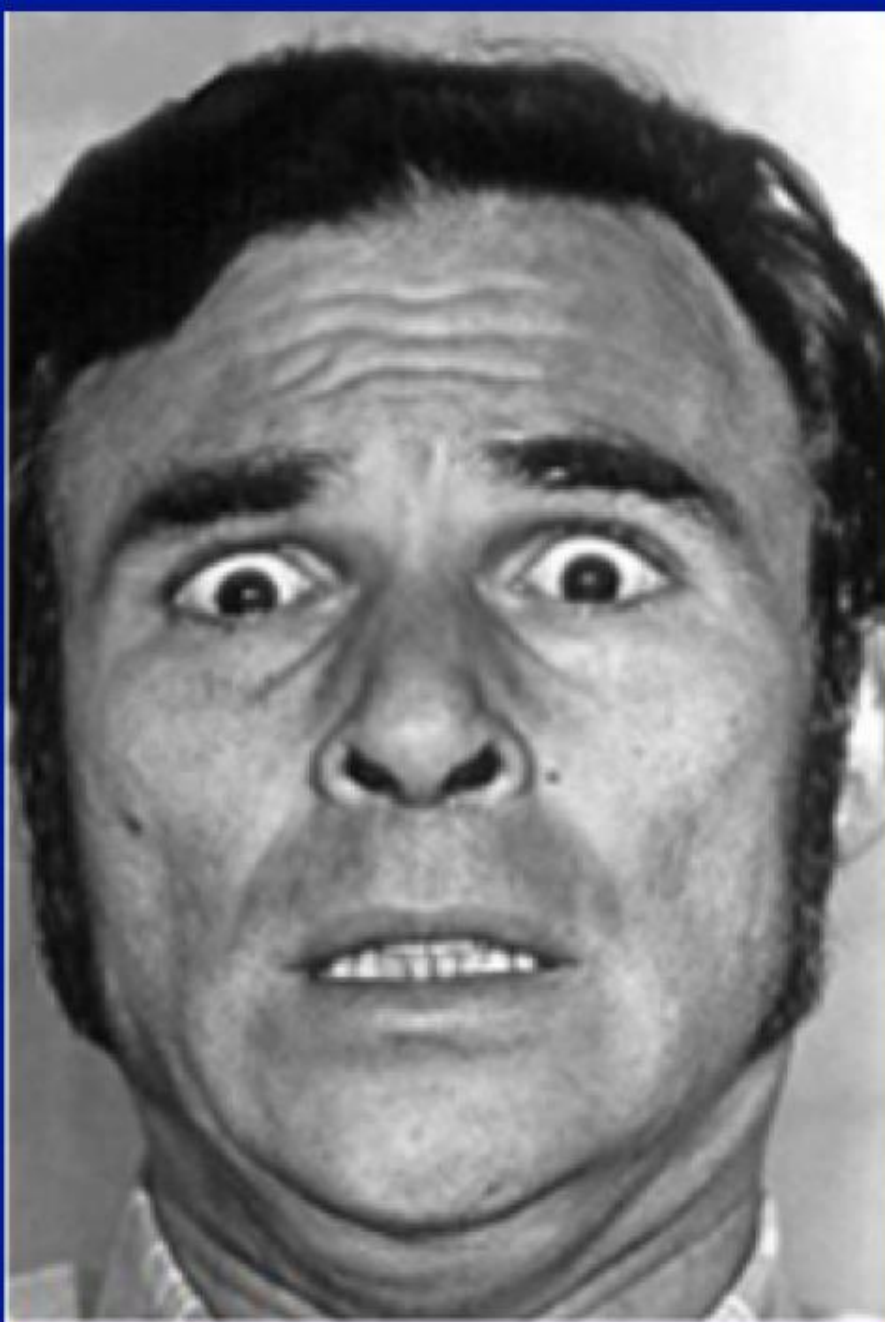


*Playingmom.com*



*raisingincrediblekids.com*





Lawrence et al., 2015, *Frontiers in Psychology* 6:1-14



What previously worked is now  
under construction



# Healthy brain development

- The combination of a teen's unique brain and environment influences the way he/she acts, thinks and feels.
- **How teenagers spend their time is crucial to brain development.** So it's worth thinking about the range of activities and experiences the teen is into – music, sports, study, languages, video games. How are these shaping the sort of brain he/she takes into adulthood?
- The parent/caregiver/adult is an important part of a teen's environment. How you guide and influence him will be important in helping the teen to build a healthy brain too.
- You can do this by:
  - encouraging positive behavior
  - promoting good thinking skills
  - helping your child get lots of sleep.



# Trauma

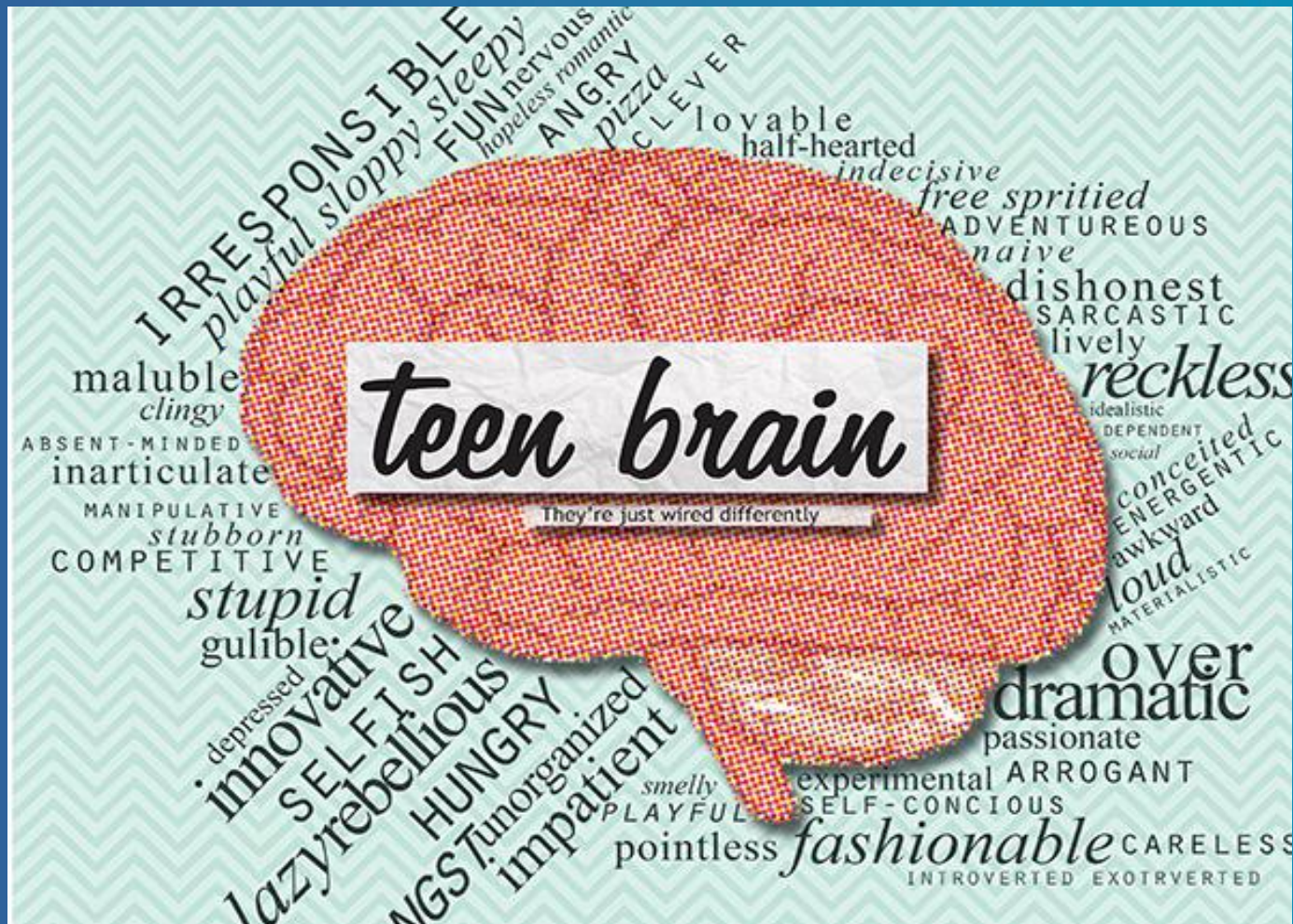


# Trauma and its consequences

## Consequences of Trauma



# Trauma and the Teen Brain



# Trauma and the Teen brain

- <https://youtube/Rc4oUoy8lXs>
- [https://www.ted.com/talks/sarah\\_jayne\\_blakemore\\_the\\_mysterious\\_workings\\_of\\_the\\_adolescent\\_brain](https://www.ted.com/talks/sarah_jayne_blakemore_the_mysterious_workings_of_the_adolescent_brain)



# We Learn by Experience





# We Learn by Experience



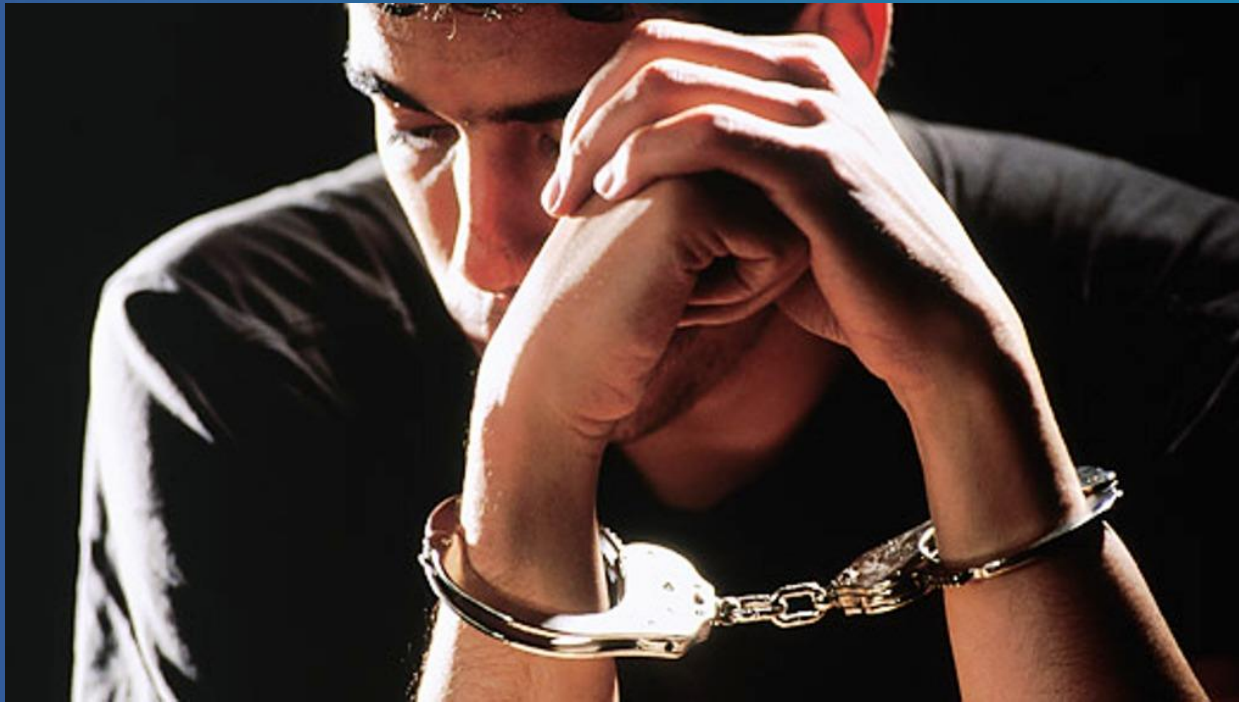
# How People Respond to Trauma: Traumatic Stress Reactions

- Reexperiencing/Reenactment
- Hyperarousal/Reactivity
- Avoidance/Numbing
- Dissociation



# How People Can Respond to Trauma: Reexperiencing/Reenacting

Re-experiencing/Reenacting: Images, sensations, or memories of the traumatic event recur uncontrollably.



This includes

- nightmares
- disturbing thoughts
- flashbacks

# How People Can Respond to Trauma: Hyperarousal/Reactivity

- Hyperarousal/Reactivity: jumpiness, nervousness, or quick to startle. For some people this feeling never fully goes away.
- Hyperarousal can lead to hypervigilance:  
a need to constantly scan the environment and other people for danger.



© 2011, Richard Ross. All Rights Reserved



# How People Can Respond to Trauma: Avoidance/Numbing



Avoidance/Numbing means that the person feels numb, frozen, shut down, or separated from normal life, and may pull away from friends and activities, even those he/she used to enjoy. Sometimes people withdraw to avoid any reminders of the traumatic event.

# How People Can Respond to Trauma: Dissociation

- One form of withdrawal and avoidance
- Mentally separating the self from the experience
- May experience the self as detached from the body, on the ceiling, somewhere else in the room
- May feel as if in a dream or unreal state
- May lose blocks of time
- May lose touch with parts of the self



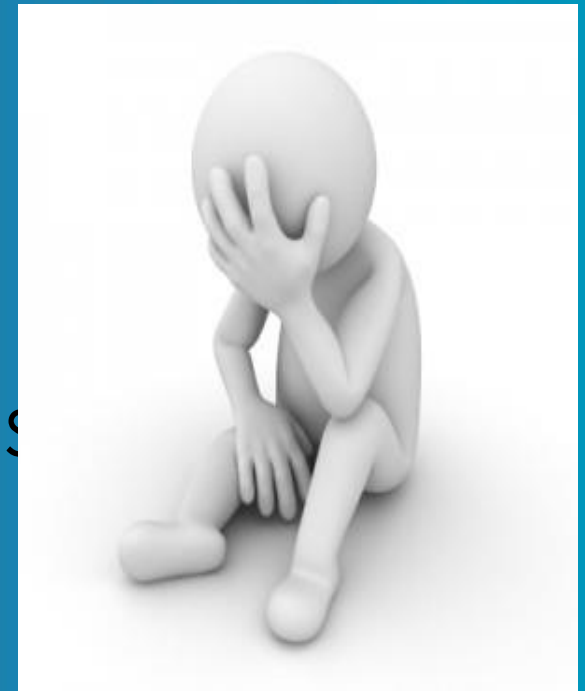
© 2011, Richard Ross. All Rights Reserved



# Signs and Symptoms of Trauma

## 6-12 years of age

- Anxious or fearful
- Worry about own/other's safety
- Emotional swings/moody
- Easily startled
- Sad or angry
- Difficulty sleeping, nightmares
- Learning problems



# Signs and Symptoms of Trauma 6-12 years of age

- Changes in school performance
- Attention seeking, clingy
- Revert to younger behavior
- Re-enact trauma in play
- No feelings about events



# Signs and Symptoms of Trauma

## 13 -26 years of age

- Feel depressed
- Difficulty imagining future or planning
- Over or under estimation of danger
- Self harm behavior, e.g. cutting
- Eating disorders
- Learning or school problems
- Inappropriate aggression



# Signs and Symptoms of Trauma

## 13 – 26 years of age

- Reckless or self destructive behavior
- Drug or alcohol abuse
- Act out sexually
- Sleep disturbances
- Pull away from activities, relationships
- Feel numb, shut down, or separated from life
- Discuss traumatic events in detail

# Trauma Informed Lens

- These youth are
  - Emotionally dysregulated
  - Scared
  - In perpetual flight, fight, freeze mode as a result of chronic stress
  - Employing adaptive coping mechanisms
  - Seeking to get needs met the only way he/she knows how
  - Lacking positive coping and self-regulation skills
  - Acting from a negative worldview or “learned helplessness”



# Enhancing success

## Cognitive

**Adolescents need training in decision making/critical thinking**

## Experiential learning

**Role playing is particularly valuable especially in emotionally charged issues**

## Self and identity

**Opportunities to feel competent and successful  
support from loved ones/trusted adult**

# Building Resilience

## **Self Esteem and Self Worth**

**Self understanding is fostered when adolescents learn to express personal points of view**

## **Autonomy**

**Adolescents should be given opportunities to exercise their autonomy while minimizing risks of negative consequences**

## **Family**

**Caretakers can be key players by setting standards for behavior, instilling values, and providing emotional support.**

# Building resilience

- When teenagers are resilient, they cope better during or after difficult situations. They 'bounce back' when things go wrong.



# Resilience

- Resilience is **the ability to ‘bounce back’** during or after difficult times and get back to feeling as good as before.
- **The ability to adapt to difficult circumstances** that you can't change and keep on thriving.
- **All teenagers can build resilience**, by developing attitudes like self-respect, social and organizational skills, and positive thinking habits.
  - **Adult support is a key building block**

# Resilience

- **Self-respect** is a great building block for resilience.
  - Grows from setting standards for behavior
  - A teen with self respect believes that she matters and should be treated respectfully by others
  - A teen will be more likely to protect herself by avoiding [risky behavior](#) and situations.
  - A strong sense of self-respect will also help a teen be less vulnerable to bullies and bullying.
- **Empathy, respect for others, kindness, fairness, honesty and cooperation** are also linked to resilience.
  - This includes showing care and concern for people who need support, accepting people's differences, being friendly, not mistreating or bullying others, and taking responsibility for your actions.



# Social Changes

- Identity
- Independence
- Responsibility
- New experiences
- Values
- Influences
- Sexual identity

# Emotional changes

- Moods and feelings
- Sensitivity to others
- Self-consciousness
- Decision-making

# Supporting social and emotional development

- Be a role model
- Get to know the teen's friends
- Listen to the teen's feelings
- Be open about your feelings
- Talk about relationships, sex and sexuality
- Focus on the positive

# Reflections

1. What have you learned about brain development and how it is affected by trauma?
2. How can you apply this knowledge?