NAVIGATING THE ADOLESCENT BRAIN

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LEARNING OBJECTIVES

- Better understanding of the interface between pubertal, psychosocial, and brain development in the adolescents that you encounter
- Gain tools to help in dealing with challenging adolescents in challenging situations
- Be more aware of positive ways to enjoy navigating your experiences with youth

QUESTIONS TO THINK ABOUT

- Why are there so many movies, books, and stories about the adolescent experience? Do you have a favorite?
- What are magical aspects of being an adolescent?
- Why is risk-taking a necessary part of growing up?

SO MANY CHANGES

The Brain
Developmental Tasks
Puberty
The Environment
**SOMATIC DEVELOPMENT**
- Pubertal weight gain = 50% adult IBW
- Lean body mass: Female↓, males↑
- 33-66% adult bone mass accrued
- Growth accounts for 20-25% adult height

**FEMALE DEVELOPMENT**
- Uterus & ovaries incr 5-7X
- Menarche avg. is 12.5 years
- Menarche is SMR 3 in 20%; SMR 4 in 56%
- 50% anovulatory cycles in 1st 2 years; 20% by 5 years

**MALE DEVELOPMENT**
- Testes, epididymis, prostate increase 7X
- Penis doubles
- Sperm in semen by SMR 3
- Ejaculation usually in SMR 4
**BRAIN/HORMONE CHANGES**

- **Gonadarche**
- **Andrenarche**

**Amygdala**
- Develops early
- Response to affect
- Instinctual reactions especially around fear, aggression
- Emotionally charged stimuli

**GRAY MATTER**
- Full brain is 95% adult size by age 6
- BUT gray matter increases childhood, peaks adolescence, declines into adulthood
- Frontal Cortex- CEO develops later in adolescence
- Rapid increase in the connections between the brain cells and pruning (refinement) of brain pathways.

**WHITE MATTER**
- Steady linear increase childhood and adolescence
- Slowing and stabilizing into adulthood
- Nerve cells develop myelin, an insulating layer which helps cells communicate.
**LEARNING/SLEEP**

- Intellectual power matches adult's. Capacity to learn will never be greater. Engage different parts of the brain in calculation, impulse control, reaction to emotional content.


**ADOLESCENT STAGES & ENVIRONMENT**

- Early Adolescence
  - 10-13 years – Elementary-Middle School

- Middle Adolescence
  - 14-17 years – High School

- Late Adolescence
  - 17-21 years ++ – College / Work

**COGNITION/PSYCHOSOCIAL**

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<thead>
<tr>
<th></th>
<th>Early</th>
<th>Middle</th>
<th>Late</th>
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<tbody>
<tr>
<td></td>
<td>Concrete</td>
<td>Increasing abstract thought</td>
<td>Future oriented</td>
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<td></td>
<td>Can’t perceive consequences</td>
<td>Reverts concrete under stress</td>
<td>Abstract thought</td>
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<td>Preoccupied body changes</td>
<td>Reestablish body image</td>
<td>Perceives long-range options</td>
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<tr>
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<td>Former body image disrupted</td>
<td>Fantasy, idealism, exploring expanded cognition</td>
<td>Emancipation complete</td>
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<td></td>
<td></td>
<td>Sense invincible &amp; omnipotent</td>
<td>Intellectual identity established</td>
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<td>May have crisis facing autonomy</td>
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**DEVELOPMENTAL DIFFERENCES**

- Cognition
- Emotional Reactivity
- Transitioning
+ ASD/ADHD

- Autism
- Excess white and gray matter, decreased pruning
- Amygdala, frontal lobes, superior temporal gyrus
- Attention Deficit Hyperactivity Disorder
- Decreased dopamine
- Decreased metabolic rate areas of judgement, attention, movement

+ STRESS/TRAUMA

- Prenatal Exposures
- Adverse Experiences
- Somatic Complaints, Increased Cortisol (Asthma, Metabolic Syndrome)

+ AFFECTIVE DISORDERS

- Anxiety
- PTSD
- OCD
- Social
- Generalized
- Depression

+ Biopsychosocial Model

Biological Influences:
- genetic predispositions
- changes in brain chemistry
- brain damage due to stress and other factors

Psychological Influences:
- negative explanatory style
- learned helplessness
- gender differences

Depressed mood

Social-cultural Influences:
- traumatic/negative events
- cultural expectations
- depression-evoked responses

Image from Psyc 100
+ SEXUALITY

- Body Changes ≠ Psychosocial Changes
- Early Adolescents - body awareness, limited dating, fantasy,
- Middle Adolescents - testing, peer influenced, exploration, romanticism
- Late Adolescents - stable, committed, future oriented

+ RISK TAKING

- Necessary
- Growth Promoting
- Teens can make safer choices.
- In the presence of friends, judgment ability differs.
- Teens more emotionally aroused than adults.

+ DEVELOPMENTAL TASKS

- Mature Sexual Identity
- Skills to be Financially Independent
- Stable Relationships
- Ethical/Religious Framework
- Ability to Care for Mental and Physical Health

+ ART OF INTERACTING WITH ADOLESCENTS

- Recognize when seeing one
- Pubertal maturity
- Environment
- Cognitive state
- Emotional state
- What are the body language, dress, and word choices telling you? Data!
- Try a test interaction
PEARLS

- Teflon
- "Patient is one with disease"
- Righting Reflex
- (Dubious) honor of being the safe person/place
- Retreat into primary care (or what is most effective thing can do today)

BEING MINDFUL

https://www.youtube.com/watch?v=VFA2N6tX2cg

RESOURCES

- Kidshealth.org
- HealthyChildren.org
- MindfulnessForTeens.com
- AACAP.org American Academy of Child and Adolescent Psychiatry
- Hhs.gov/ash/oah Office of Adolescent Health

REFERENCES

- http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3410522/