STRESS, SLEEP, AND SOCIAL MEDIA: Factors impacting adolescent brain development, teaching, and learning
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Objectives: Following this session, participants will be able to:

1. Describe the development of the adolescent brain as it may impact learning.
2. Discuss the impact of stress, sleep, and social media on learning.
3. Analyze selected two-way teaching strategies that may enhance mutual learning.

The teen brain: Introduction

- It’s not how old you are, it’s when were you young?
- It isn’t “us and them”—understanding more about the teen brain helps us understand and work with teens. Focus on positive youth perceptions, behaviors, and development!

The kids these days? “Our youth now love luxury. They have bad manners...contempt for authority...they show disrespect for their elders...favor chatter in place of exercise...they contradict their parents, gobble up food, and tyrannize their teachers.” Who said that?

- Put it to work: When is adolescence? Think-Pair-Share:
  - When does adolescence begin?
  - When does adolescent end?
- Sensitive/critical periods for development and achieving milestones
• **Put it to work:** Concrete manipulatives—making connections

![Toys or manipulatives...]
Pull something out of your pockets, brief case, belongings, or pocketbook that reminds you of a teen...Why?

**The teen brain: A work in progress—three processes**

• New research and technology allows us to see the teen brain develop
• Different parts of the brain...different functions

![Human brain with left and right hemispheres]

**Put it to Work:** Try it out: The Amazing brain: Exercise:

- Lift your right foot off the floor and make clockwise circles.
- Now, while doing this, draw the number '6' in the air with your right hand. What happens? Did you “cause it to happen?” Could you stop it?

**Three Processes**

1. **Proliferation**—increase in number of neurons

   - Used to think brain cells were all developed by 5 years (Headstart)
   - Now we know it peaks 11-13 years—“white noise” of this period....their brain is full...consider teens you know at this age—listen or hear?
   - Aborization—neurons branch and grow, unfettered growth
   - Stimulates Pruning—**Put it to work:** Remember when: What skills did you have as a child that you no longer think about? Were they pruned?
2. Pruning—“use it or lose it” “use it to improve it”
   - **Put it to work:** Imagine: Think about your messiest drawer in the house—declutter
   - Prunes away unused nerve cells, leaves those that are used
   - Reinforcement of behaviors—offer many and varied rich activities, let teens decide their personal interests and strengths!
   - “Creating paths through the forest that are easier to pass through”

**Put it to work:** Organizing the brain:

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3. Myelinization—like insulation on a wire, faster and more efficient connections; but also slows learning and healing

   - **PROCESSING!**
   - Anyone ever teach a teen to drive?
   - Reaction versus processing time.
   - Teens learn and heal fast!
   - Learn a foreign language as an adult?
4. All happens from the back to the front of the brain

   Back
   i. Amygdala—fear, rage; “the beast within us,” also enthusiasm and creativity. Do hormones or amygdala explain teen behavior?
   ii. Cerebellum—coordination, problem solving

b. Middle

   i. Basal ganglia—priority setting
      organizer of the brain
      1. “Clean your room”
      2. “Clean up your act!”
      3. Priority setting—
      4. Put it to work
         a. List the three most important things to you
         b. Take one away, then another—your priority!

c. PREFRONTAL CORTEX

   i. “do the right thing,” “tames the beast within us,” “area of sober second thought,” “puts the brakes on the engines of emotions.”
   ii. Teens are a fast car with an inexperienced driver.
   iii. Mental workspace, planning, weighing of consequences and benefits, rational thinking, assuming responsibilities, resist impulsiveness/impulses

iv. Ability to express feelings
   1. “Where are you going?”
   2. “What are you doing?”
   3. “Who are you going out with?”
   4. “When will you be home?”
   5. “Are you planning on having a child in the next year?”
v. Development of empathy—the developing cingulate gyrus—empathy and learning

Put it to work: Remember When: When was the last time you did something...

- That you had never done before
- That you didn’t feel comfortable with
- That you were afraid to do
- That you didn’t really understand
- That you were afraid to ask for help with
- That other people thought you should already know how to do
- That was expected of you

- How do we encourage empathy in teens?

- Sensation seeking—not all sensation seeking is bad! Opportunity! Adventure!
  - Sensation seeking-stimulates dopamine; teens seek out risk
  - They know consequences—disregard and want the dopamine rush!
  - Remember the feeling of excitement as a child and teen?
  - Ever know a teen who was bored?

Put it to work: Quick write:
Think of a time that you did something risky as a teen.
What would you say about that behavior now?
• **Motivation for rewards-nucleus accumbens**
  o Teens respond to high excitement/low effort
  o Teens respond more to rewards than consequences
    ▪ **Put it to work:** In 2 minutes, list as many rewards for teens as you can-you only have a $50 budget for 10 teens...
  o Think about the sensations—"appetite for thrills"
  o Immediate and relevant rewards
  o **Put it to work:** Delay discounting
    Delay discounting....would you prefer:
    ▪ $200 tomorrow or $1000 in one year
    ▪ $800 in one month or $1000 in one year
    ▪ $600 in 6 months or $1000 in one year
  o Oh no...you broke your phone...what next?
  o Delaying gratification

• **Social investigation**
  o Friends
    ▪ Peaks 14-18 years
    ▪ Instinct
    ▪ Positive and Negative Impacts
  o Yellow light study
  o "If all your friends jumped off..."
  o Self-consciousness and peer motivated behavior

• **Decision making**—how do impulsivity, seeking rewards, desires for sensation seeking, the influence of peers, difficult interpreting emotions, and developing empathy impact making good decisions?
  o Immediate and certain versus delayed and uncertain
  o Think about it: You were late for a meeting and drove a car too fast????
  o Know consequences—seek sensations
  o Teen decision-making: Rationale Process, Total Impulsiveness, or a Developmental Hybrid?
The BRAIN and STRESS

- Stress: “a great deal of pain that’s inside your body that you can’t get out... and makes you feel bad”

- Teens and Stress
  - Teens react with greater vital sign changes and hormone releases in response to stress
  - Teens have a slower recovery period in response to stress
  - Greater level of disruption than adults

- Are teens stressed? Stress in America Survey (APA)
  - Teens score an average of 5.8 (>3.9 considered "unhealthy levels")
  - Scores higher than adults-5.1
  - >30% depressed secondary to stress (girls 37%, boys 23%)
  - 36% fatigue r/t stress, 42% not handling stress well
  - 40% of teens-emotional/mental health issues

- What stresses out teens?
  - Make a list of the top five stressors
  - Research tells us: social media, school, money, relationships/peers, parents

- Impact of stress on Brain:
  - HPA Axis-hypothalamus-pituitary-adrenals-neurotoxic
  - Chronic exposure to corticosteroids-shrinks the hippocampus
  - Hippocampus-responsible for memory/learning
  - Chronic stress: decreased ability to cope with stress
  - Reduced serotonin—neurotransmitter to even out mood
  - Constant hyperarousal—PTSD
Dopamine levels increase—vulnerable to the stimulation/addictive qualities of drugs and -OH—further implications for memory and learning.

Genetic, familial, and environmental factors

Increased stress—high stress and low support associated with decreased self-regulation and self-regulation helps cope with stress and increases learning.

SELF-REGULATION

Definition: voluntary control of attentional, emotional, and behavioral impulses when immediate temptations conflict with more enduringly valued goals

2 strategies

1. Improve self-control/self-regulation
   The Marshmallow or Cookie test
2. Reduce strength of perceived impulses

MINDFULNESS

Consciousness, Attention, & Awareness
Mindfulness interventions found to:
- Decrease impulsiveness, perceived stress, and depression
- Increase ability to focus, self-compassion, empathy, ability/self-efficacy to assume responsibility
- Helping teens become aware of this information and be observant in their daily lives!
- Take inventory of your life—self, relationships, and thoughts
- Silent sitting
- Pay attention
- Positive outlets
- Perceptions
Strategies for self-regulation:

Mindfulness—yoga, worship, hobbies, reading
Physical activity—sports, hobbies, activity, work
Reframing—cognitive effort to change perceptions
Self-talk—count to ten, “help yourself understand,” remind oneself of assets
Response modulation—take a run, choose not to engage in a risky behavior
Goal setting—focusing on the goal and strengthening response to distractions

Put it to work: Encouraging Self-Regulation: Get into groups of four to five, for your specific work environment—consider the list above...what strategies would you suggest for your teen population? What would not work?

The BRAIN and SLEEP

- Recommended—9 hours, most get 5-6 hour/night
- Put it to work: How much sleep did you get last night??
- Most teens suffer from insufficient sleep and rest
- Pineal gland—melatonin—causes sleep and “shut down,” develops as teens grow
- Takes longer in teens and young adults
- Sleep encourages pruning—“sleep to forget” and “enhance memory”—placed into long term storage for later retrieval
- Starts nighttime later
- “Screen time”—impact on sleep
- Importance of a sleep routine
- Increased seeking of stress relief—alcohol and drugs (self-medication)
- Impact of substances on sleep
- Increased incidence of depression
- Do we have a whole generation of exhausted and slightly stressed-out teens!
- Implications for learning, mornings, teen behavior, moods
  - We learn when we are rested, nourished, and hydrated
  - We learn when we are calm and supported
  - We learn when we feel safe and comfortable
Put it to work: Reframe: How does my sleep compare with my moods?

How are you feeling today?
Draw the face that fits your mood and record the number of hours you slept.

The BRAIN and SOCIAL MEDIA

- "Teens' online lives are an extension of their offline lives."
- Positives of social media and negatives of excessive social media
- Brain perceives rewards of "likes" and positive messages—activates the nucleus accumbens—and the converse is true also! More responsive to the sites that were "liked" by peers. Now, rewards are more quantitative (number of likes) rather than qualitative (facial gestures, expression, etc.). These "likes" may reduce teens' abilities to resist risky behaviors—reduces teens' responses to the "be careful filter."
- Plastic teen brain—adapting, teens less adept at interpersonal interactions; more skilled at managing a group of friends
- Social media has the capacity to enhance and detract from self-esteem
- Decreased levels of self-regulation/peer pressure—increased susceptibility to social media experimentation and victimization
- Implications for learning:
  - Media-centric education
  - Cross cultural learning
  - Reach teens otherwise not accessible
  - Reductions in attention spans
  - Impact of social media on sleep
  - Desensitization to violence
  - Increasing IQs and girls in science
  - Learning more about learning

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Put it to work: Think-Pair-Share

What’s the big deal?
Why is this so important?
What else do we need to know?
What can we do about it?

Two-way Teaching and Mutual Learning

- Active teaching strategies that engage learning, allow for classroom and learner assessments, are flexible to learner/facilitator needs, and are fun!
- Engage students in material through active participation
- Reinforcement to ensure “mental aerobics.”
  - We need to hear or engage in information at least three times to ensure learning
  - This exceeds the action potential of the cell so that the impulse is able to transfer the “message” to the next neuron
  - Short-term organization and connections with known material
  - Long-term storage for retrieval—sleep, managed stress, nutrition, physical activity, supports, coping mechanisms, self-regulation

Put it to work: Get back into your groups of 4

Hints on group work

- You pick or they pick?
- Stay in the room, walk among them, be involved, DO NOT CHECK PHONE!
- Use candy or other things to select groups—count off, birthdays, colors
- Mix them up

Stuck: Your group is stuck on an elevator with 5 teens. You find you will be “stuck” on this elevator for 24 hours but you are safe, have enough oxygen, have plenty of room, you will be warm, and there will be light for the entire duration. Security has informed you that they will lower one grocery bag full of requested objects down into the elevator. You need to work with your group to consider what objects you would like in the bag. Consider the needs of your teens & group. You have 3 minutes to make up your list.
OTHER STRATEGIES!

Observation exercise:
- You will have 3 minutes to write down as many words as you can to describe your neighbor’s shoes...How many did you come up with?

Implications: Be observant and notice details in our daily lives!

Reflection exercise (Ah-Hah!):
- Describe an interaction you have had in the past with a teen. (Critical incident)
- What made that interaction memorable? (Memories)
- What aspects of teen brain development may have influenced that interaction? (Connections)
- How will you use that in future interactions with teens? (Implications)

Common and Different
- Pair up with someone in the room
- Discuss-3 things you have in common and three things that are different
- Implications: Consider the similarities and difference in each of us!

Invented Dialogs

Come up with responses to statements-like role play! Practice-Rehearsed Responses!
- “No one has ever felt the way I do…”
- “I can do whatever I want...nothing will hurt me…”
- “I am so stressed out, I can’t do my homework.”
- “Why do I have to do this...it is stupid.”
- “What do you know...you’re not my boss.”
Implications: Have a “ready response” available in times of difficulty.