

Mental Health and Behavioral Outcomes of Pediatric Brain Injury:

Identification and Management of Concerns within the School Setting

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We are all born with great potential.
Shouldn't we all have the chance to achieve it?





Presenter Disclosure

Lindsay Cirincione, PsyD

There are no relationships to disclose related to this presentation.



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A black and white photograph showing several hands of different skin tones stacked on top of each other, symbolizing unity and support.

Objectives

- Increase understanding of mood, mental health, and behavioral outcomes of pediatric brain injury (BI)
- Increase ability to identify mood, mental health, and behavioral concerns in the school setting
- Provide tools and strategies for managing mood and behavioral concerns in the classroom
- Increase understanding of the impact of mood and behavioral concerns on ability to learn
- Increase understanding of concussion-specific concerns and provide tools for supporting full return in children with concussion





Outline



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Setting the Stage: Introduction to Pediatric Psychology and Pediatric Brain Injury



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What is Pediatric Psychology?

- ...address[es] the relationship between children's physical, cognitive, social, and emotional functioning and their physical well-being, including maintenance of health, promotion of positive health behaviors, and treatment of chronic or serious medical conditions.
- Use principles of learning, behavior, and evidence-based treatment
- Help children function better behaviorally, psychologically, and physically across medical, home, school, and community settings.
- Help children and families achieve a better quality of life



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Brain Injury – Definition & Statistics

- Brain injury is an insult to the brain that can be due to external mechanical force (TBI) or non traumatic causes.
- Most common cause of acquired disability for children 0-14 years of age.



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Brain Injury Etiology

Anoxic Brain Injury

- Disruption of blood supply leading to oxygenation deprivation in the brain
- Outcomes vary based on severity of brain cell death

Traumatic Brain Injury

- Blunt or penetrating injury to the head that is associated with cerebral trauma
- Severity refers to amount of acute disruption of brain physiology or structure

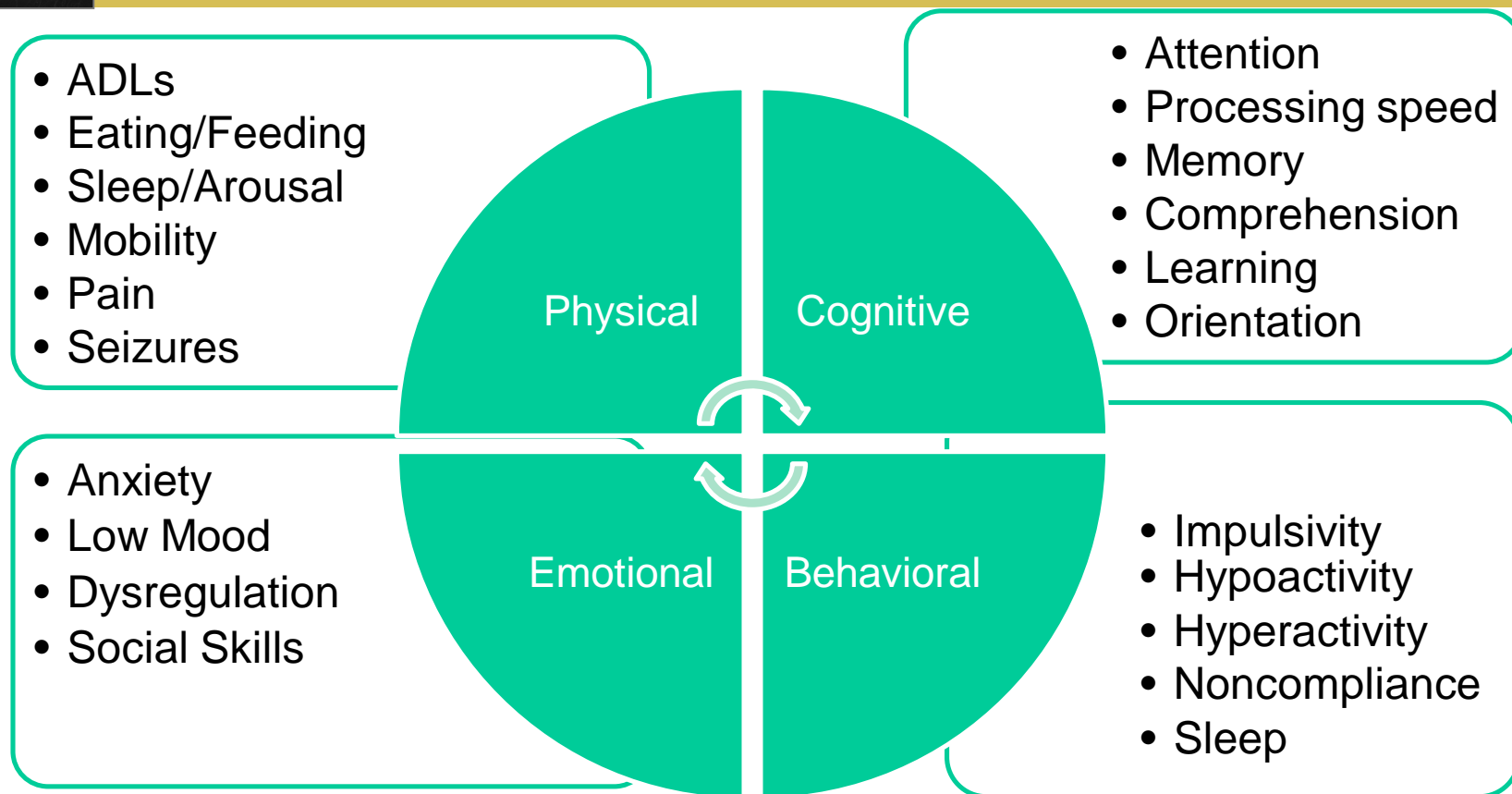


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Brain Injury Symptom Domains

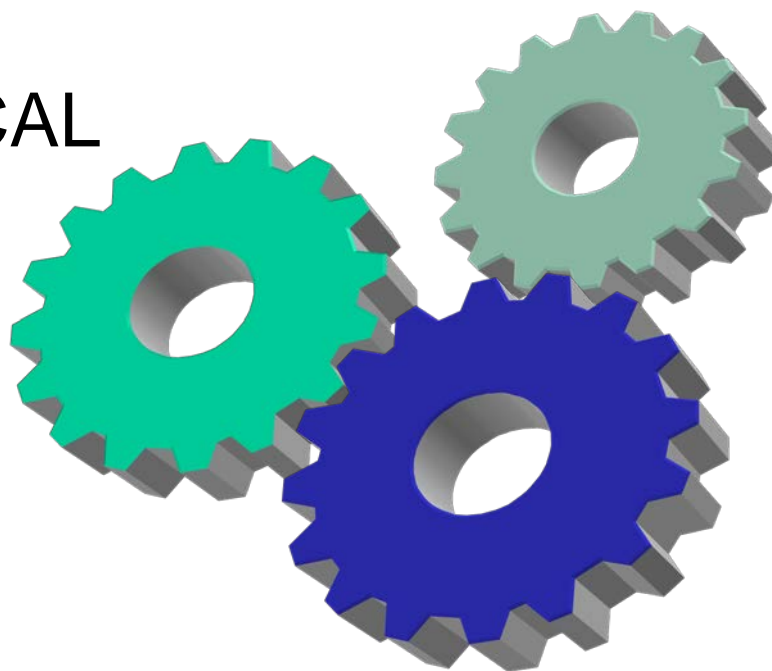




Integrative Biopsychosocial Approach

BIOLOGICAL

SOCIAL



PSYCHOLOGICAL

“...each one of these factors is not sufficient to bring about health or mental illness, but the interaction between them determines the course of one’s development.” (Engel, 1977)

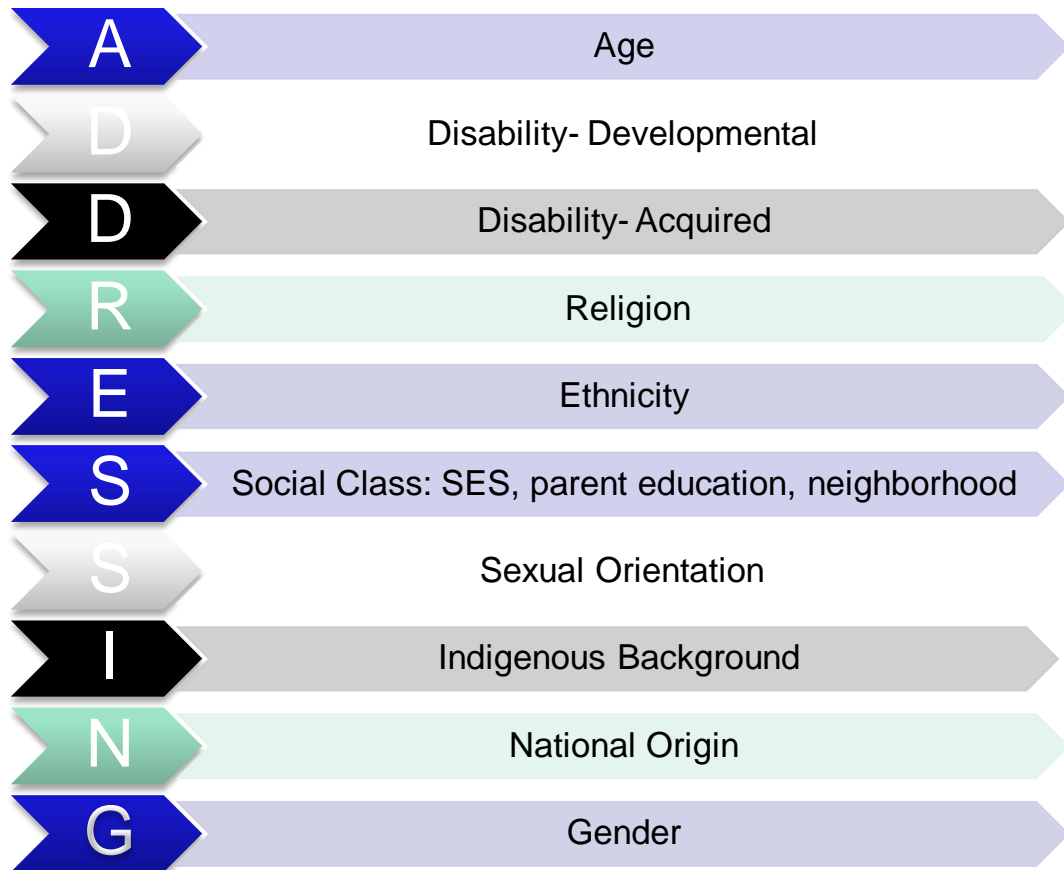


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Cultural Considerations

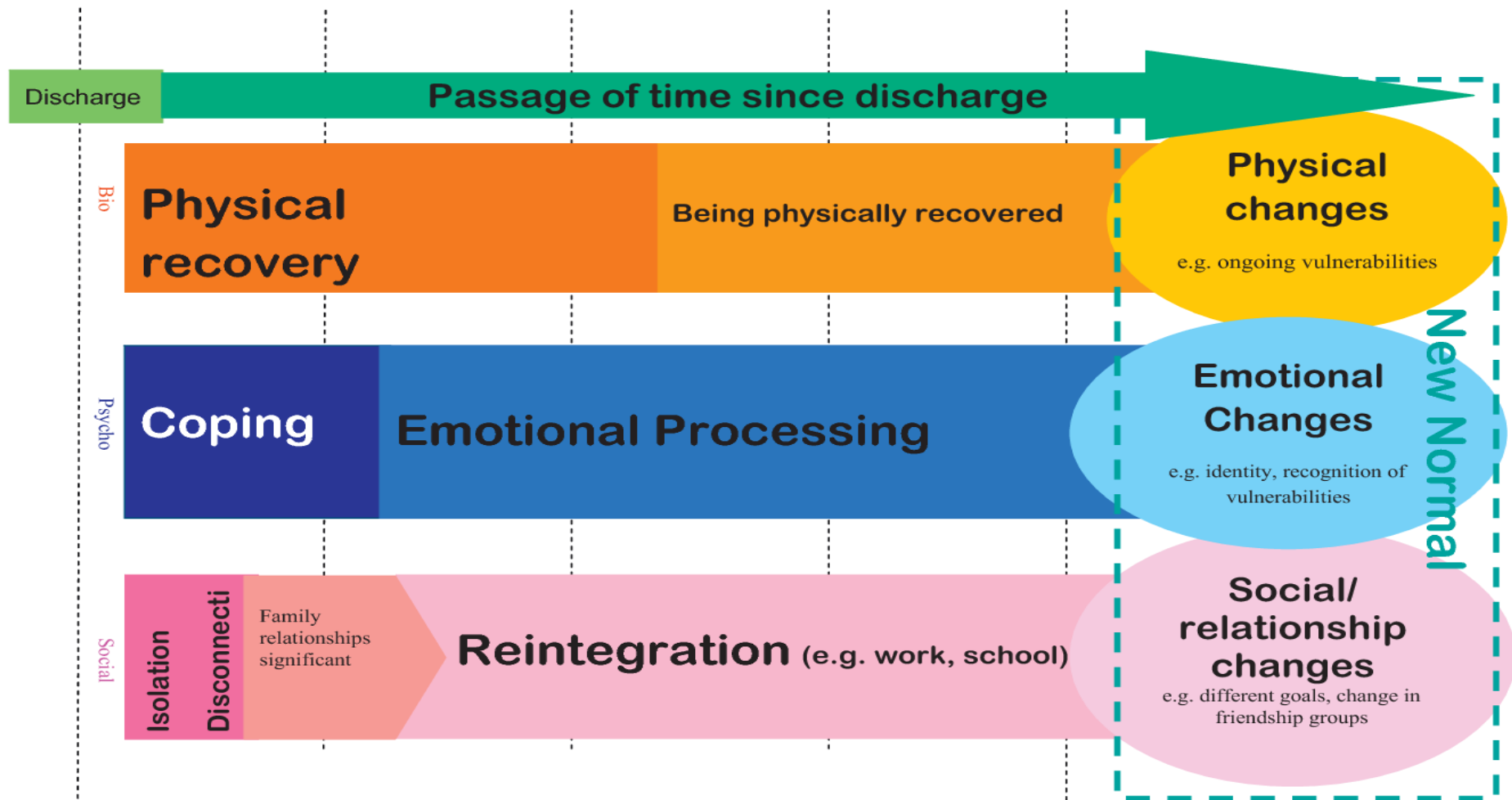


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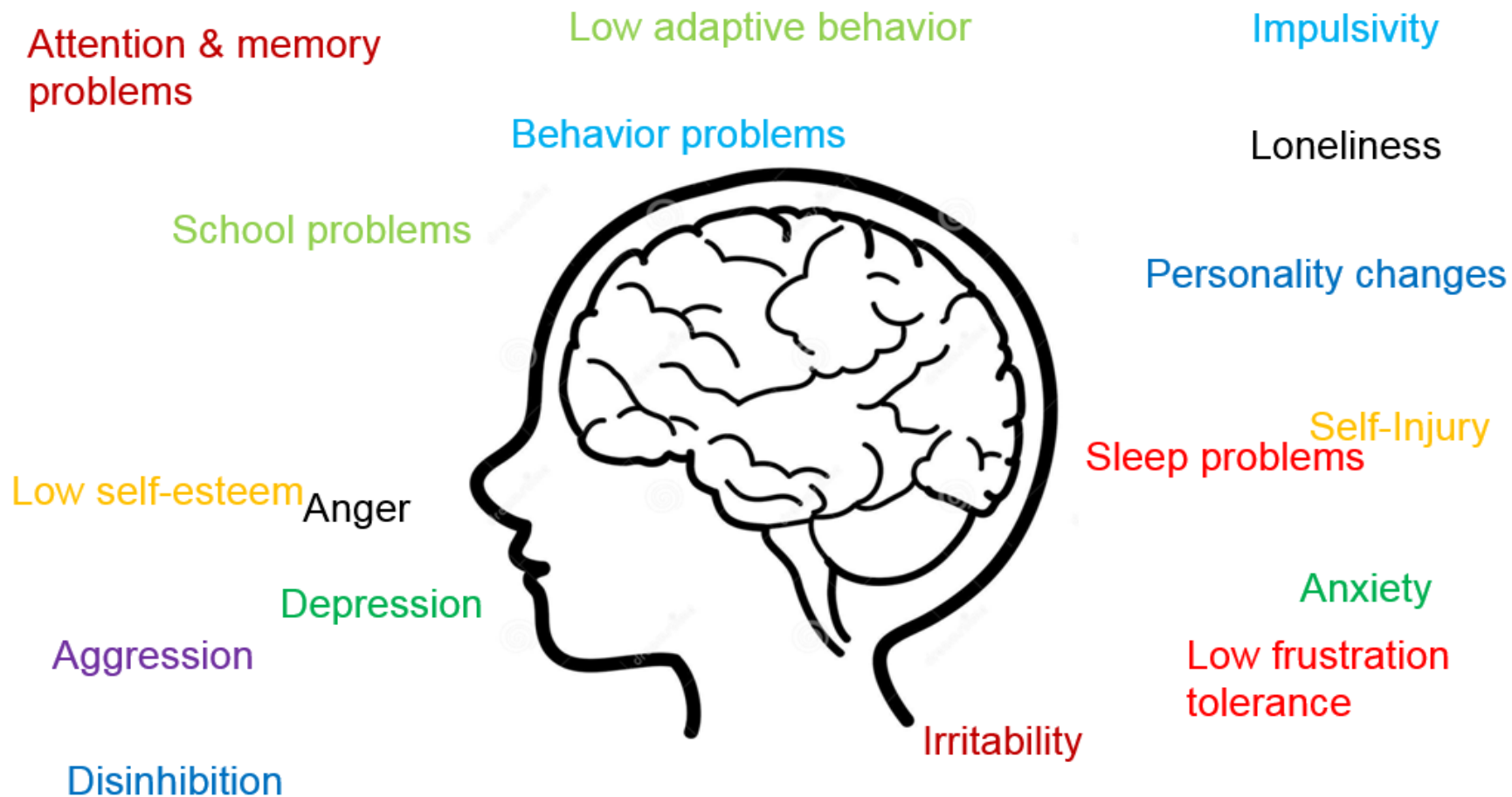


Biopsychosocial Model of Recovery





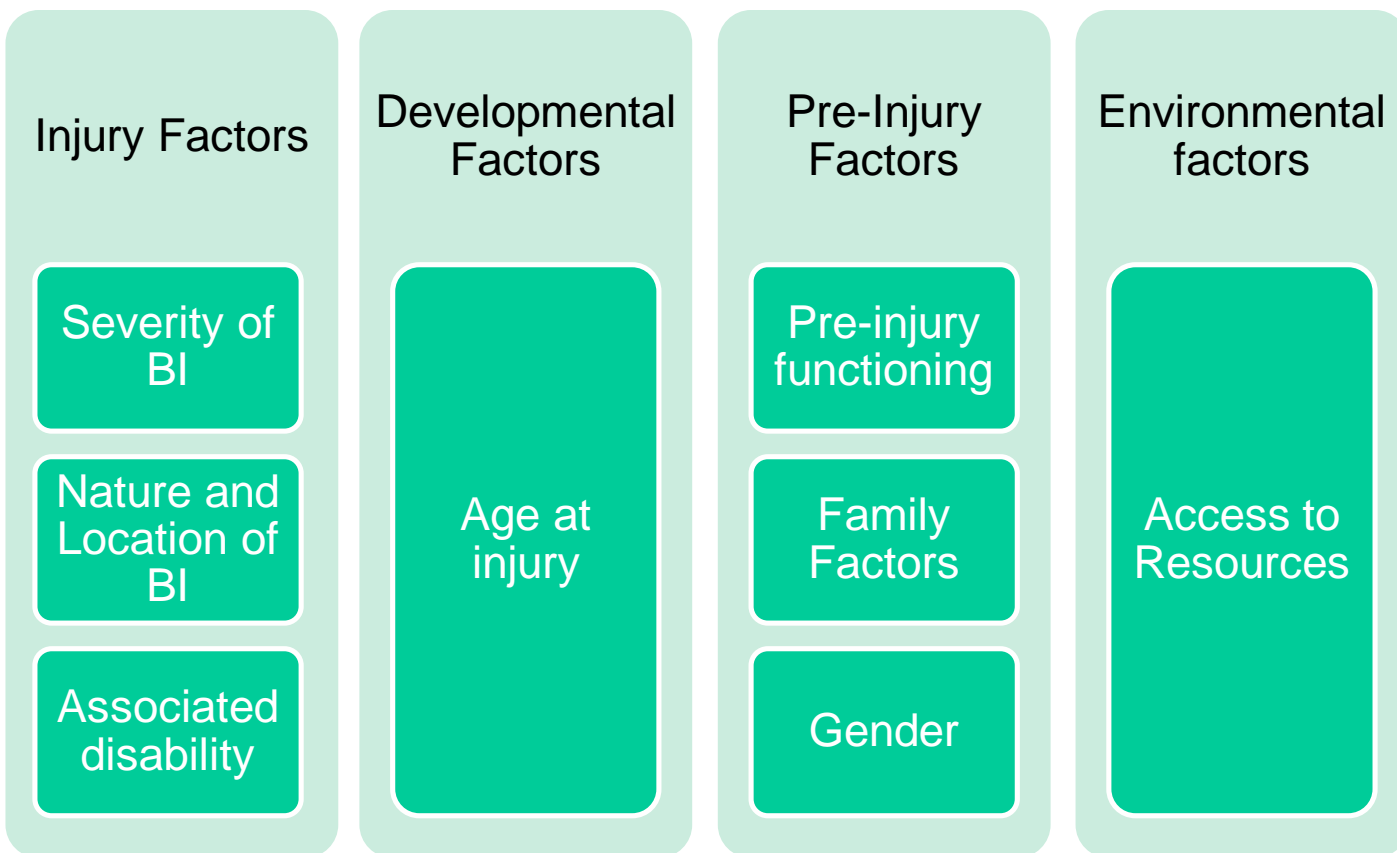
Emotional & Behavioral Outcomes of Pediatric Brain Injury



i.e., Andrews, Rose, & Johnson, 1998. Hooper et al., 2004. Wassenberg et al., 2004. Max et al., 2005a & b, 2006, 2011, 2012, 2013, 2015. Ylvisaker et al., 2007. Hawley, 2012.



Predictors of Outcome from Pediatric BI



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Personality Change

- A marked deviation from the child's normal personality
- 0-6 months: 22% reported personality change
 - Severity of injury predicted the change
 - Associated with externalizing disorders
 - Lability was the most common change
- 6-12 months: 13% reported change
 - Severity of injury predicted change
- After 2nd year: 12% reported change
 - Pre-injury functioning predicted change



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Sleep Problems

- Can be acute or long term
 - Insomnia/hypersomnia
 - Sleep-disordered breathing
 - Fatigue
- Problems associated with BI-related sleep concerns
 - Physical comorbidities
 - Need for medication
 - Cognitive concerns
 - Behavioral/psychological comorbidities
 - Parenting difficulties



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Emotional & Behavioral Problems

- Factors that Increase Risk
 - Inpatient admission
 - Lower IQ
 - Pre-injury behavior
 - Age at injury
 - Injury Severity
 - Location of Injury
 - Family variables
 - Parent marital status
 - High parent stress
 - Social Deprivation
 - Socioeconomic Status



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Injury Location: Effects on Mood & Behavior

- Frontal Lobe
 - Attention
 - Executive Functioning
 - Reasoning
 - Problem Solving
- Temporal Lobe
 - New learning
 - Memory Consolidation



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A new normal in the classroom

- The majority of children return to the classroom regardless of injury severity/type
- Appropriate supports are essential to success
- Things to consider:
 - Pre-injury functioning
 - Peer impact
 - School resources



Back to School: Managing Behavioral Concerns in the Classroom



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One Quick Note....

- The majority of children who have sustained a BI will have formalized educational supports in place
 - 504
 - IEP





Step One: Collaboration

- Good communication with the family and treatment team (if possible) is critical
- Knowing how a child is coping *prior* to their return to school can set everyone up for success
 - Teachers know what to expect
 - Families know how to support
 - Communication can be optimized
- Avoid re-inventing the wheel!





Speaking the Language: Behavioral Terminology

- **Externalizing Behaviors**
 - Actions in the external world such as acting out, antisocial behavior, hostility, aggression
- **Noncompliance**
 - Failure to comply with a demand
 - Passive ignoring
 - Simple refusal
 - Direct defiance
 - Negotiation





Speaking the Language: Behavioral Terminology

- **Aggressive Behavior**
 - Asserts dominance, threatens/harms self or others such as Hitting, Punching, Kicking, Grabbing, Scratching, Pushing
- **Disruptive Behavior**
 - Chronically threatens/intimidates others or violates social norms such as throwing objects, kicking/banging surfaces
- **Distress Behaviors**
 - Negative stress response such as verbal, behavioral, and affective displays of anxiety, worry, pain, or stress.



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Speaking the Language: Behavioral Terminology

- **Internalizing**
 - Processes within the self such as anxiety, somatization, and depression
- **Avoidance**
 - Action to avoid anticipated unpleasant or painful situation, stimuli, or event
- **Escape Behavior**
 - Response to move away from or eliminate an already present aversive stimulus
- **Elopement**
 - The departure of a child from a location without permission





The Functions of Behavior

- **Attention**-getting ANY kind of reaction from others
 - Can be positive or negative attention.
 - Can be verbal or nonverbal attention.
- **Escape**-avoiding non-preferred tasks or events that cause emotional distress (e.g., anxiety, pain, etc.)
- **Tangible**-access to a desired stimulus (i.e., food, toys, an activity)
- **Internal/Automatic**-self-stimulatory behavior; self-soothing behavior (i.e., to manage pain/distress)





Antecedent Management

- Changing a child's behavior by manipulating what precedes it.
- Learning may be inefficient or occur differently following BI
- Particularly useful in early stages of recovery from more severe BI, when contingency learning is difficult
- Crucial in managing dangerous or severe behaviors
- It is important to assess both observable (environmental) and difficult to observe antecedents (pain, discomfort, autonomic arousal)





Antecedent Management

- Decreasing sensory stimulation
- Decreasing frequency/duration of difficult tasks
- Allowing for appropriate outlets for motor agitation
- Visual schedules, memory logs, etc.





Where Attention Goes, Behavior Grows!



“OK” Child Behavior



“NOT OK” Child Behavior

Parent Attention
Increases Behavior



Positive Attention
“Catch your child being good”

**Positive
behavior
increases**

“Criticism Trap”

**Negative
behavior
Increases**



No Parent Attention
Decreases behavior



“Let sleeping dogs lie”

**Positive
behavior
decreases**

Ignore

**Negative
behavior
decreases**



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Where Attention Goes, Behavior Grows

- **Warning:**
 - It is very easy to inadvertently reinforce problem behaviors in a school setting
 - Soothing, inquiring about discomfort, discontinuing demands, removal from classroom
 - Sometimes problem behaviors are adorable!





Toolbox – Planned Ignoring and Differential Attention

- Planned Ignoring
 - If it can be safely ignored, IGNORE IT!



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- Differential Attention
 - Provide praise for the behaviors you want to see
 - “Catch them being good”



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Toolbox – Task Analysis & Visual Cues

- Breaking down a complex task or behavior
- Presenting one step at a time
- Reduces uncertainty and fear
- Can result in improved learning of a new skill





Example – Entering the Classroom

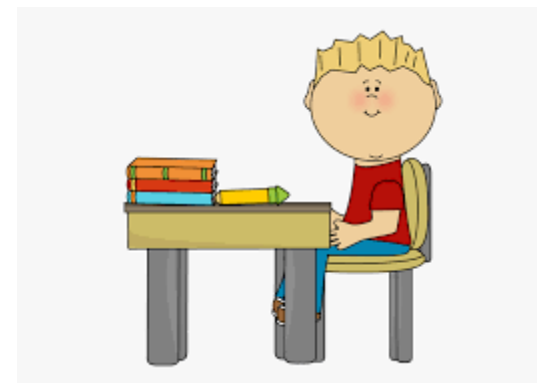


Enter Classroom



Hang Up Stuff

Hang Up Backpack



Sit At Desk





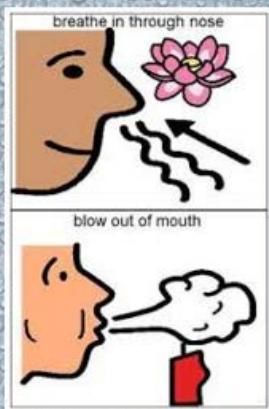
Toolbox – Calm Down Visual Cue

Calm Down Book

Calm Hands
On Table



Take Deep Breaths



Take a Break



Ask for space



Muscle Squeezing Exercises

1. Lemon
2. Stretching Cat
3. Turtle
4. Pesky Fly
5. Mud Puddle
6. Elephant
7. Bubble Gum

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
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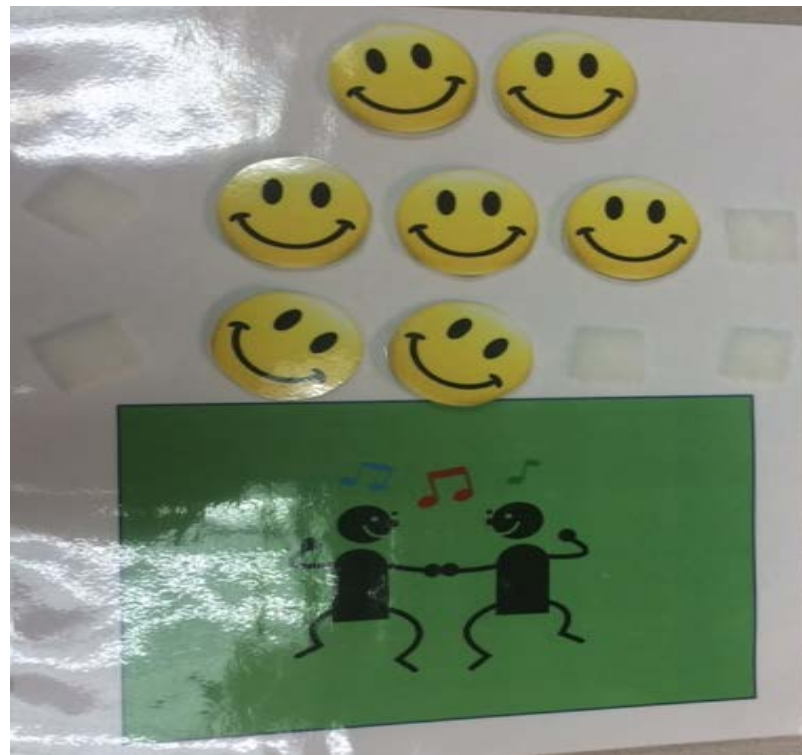
Toolbox – Combining Visual Schedule with Reinforcement

Fecha: _____

_____'s Tabla Diaria de Terapia

Actividad	Participa por lo menos 75% (Regala "Sticker" o escribe "No")	Nivel de Angustia (😊, 😐, ☹️)	Comentarios
Terapia Física en la mañana 			
Terapia Ocupacional en la mañana 			
Terapia de habla 			
Terapia Física en la tarde 			
Neuropsicología 			
Centro de Terapia 			
Otra Terapia 			

*Basada en una session de terapia de 30 minutos: 😊: No angustia; 😐: Angustia mediana o minimo (quejandose un poco; llorando; interrupcion; capaz de completar la mayoria de las metas in terapia); ☹️: Angustia severo (gritando; agresion fisico; no podia completar las meta en terapia)



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Toolbox – Planned Breaks & Activity Pacing

- Planned Breaks
 - Notice when a child typically “wears out” or displays problem behavior
 - Introduce breaks before problems typically occur
- Activity Pacing
 - Work for a predetermined amount of time, take a 5-10 minute break in a quiet space
 - Return to the activity



Back to School: Managing Mood Concerns in the Classroom



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Depression & Anxiety

- 25-60% of individuals with BI experience a depressive episode after injury
- Depression is associated with poorer:
 - Cognition
 - Social Interaction
 - Overall functioning
- Depression can amplify other challenges
- Generalized Anxiety Disorder, Panic Disorder, OC/D, PTSD occur at increased rates in individuals with BI



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Symptoms of Depression in Children

Irritability

Sadness or
Hopelessness

Withdrawal

Increased
Sensitivity

Changes in
Appetite

Changes in
Sleep

Crying or
Tantrums

Difficulty
Concentrating

Fatigue

Physical
Complaints

Difficulty
Functioning

Feelings of
Worthlessness



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Symptoms of Anxiety in Children

Worry

Perfectionism

Fears related to
safety (self &
others)

School Refusal

Difficulty
Concentrating

Irritability

Trouble
Sleeping

Difficulty
Relaxing

Difficulty
Separating from
Trusted Adults

Somatic
Complaints

Restlessness

Frequent
“Checking”



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Other Things to Consider

- Pre-injury academic functioning
- Pre-injury mood concerns
- Pain in lower functioning kids
- Impact of sleep





Toolbox – Mood Concerns

- Support with mood regulation
 - Calm down strategies/breaks
- Differential Attention
- Planned Breaks
- Scheduled Check-Ins
- Collaboration with parents
- Referrals to supports as appropriate
- Lunch Bunch/Hallway Buddy



Case Example



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Case Example – “Aaron”

- 5yo with history of Craniopharyngioma with resection
- Impulsivity, poor frustration tolerance, fixation/rigid behavior, significant daytime fatigue
- IEP under OHI
 - 1:1 aide in the classroom
- School concerns
 - Frequent meltdowns/tantrums/refusal behaviors
 - Difficulty transitioning to lunchroom
 - Aggressive behavior toward peers when frustrated





Case Example – “Aaron”

- Planned breaks
- Rest break in nurse’s office
- Differential attention
- Reinforcement Plan
- Lunch buddy
- Calm down visual cues
- Visual schedule for the day
- Treatment for Anxiety



Stretch Break!



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Concussion



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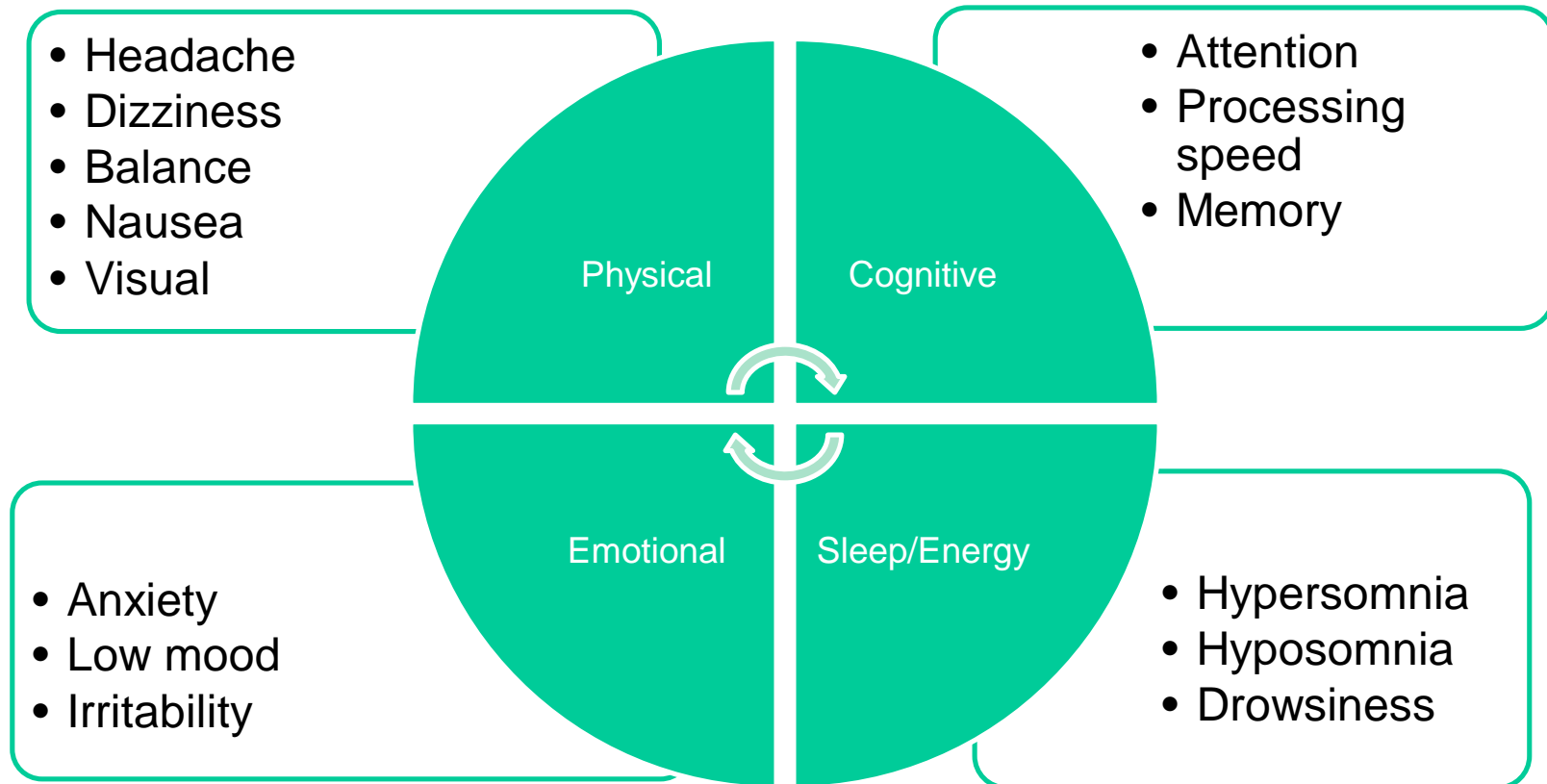
What is a Concussion?

- CDC Definition of Brain Injury
 - “a disruption in the normal function of the brain that can be caused by a bump, blow, or jolt to the head, or penetrating head injury”
- Concussion = Mild Traumatic Brain Injury (mTBI)
 - Normal Imaging
 - Loss of Consciousness (LOC) 0-30 minutes
 - Glasgow Coma Scale (GCS) score 13-15
 - Post Traumatic Amnesia (PTA) \leq 24 hours
- Estimate of sports related concussions in youth
 - 1,876,700



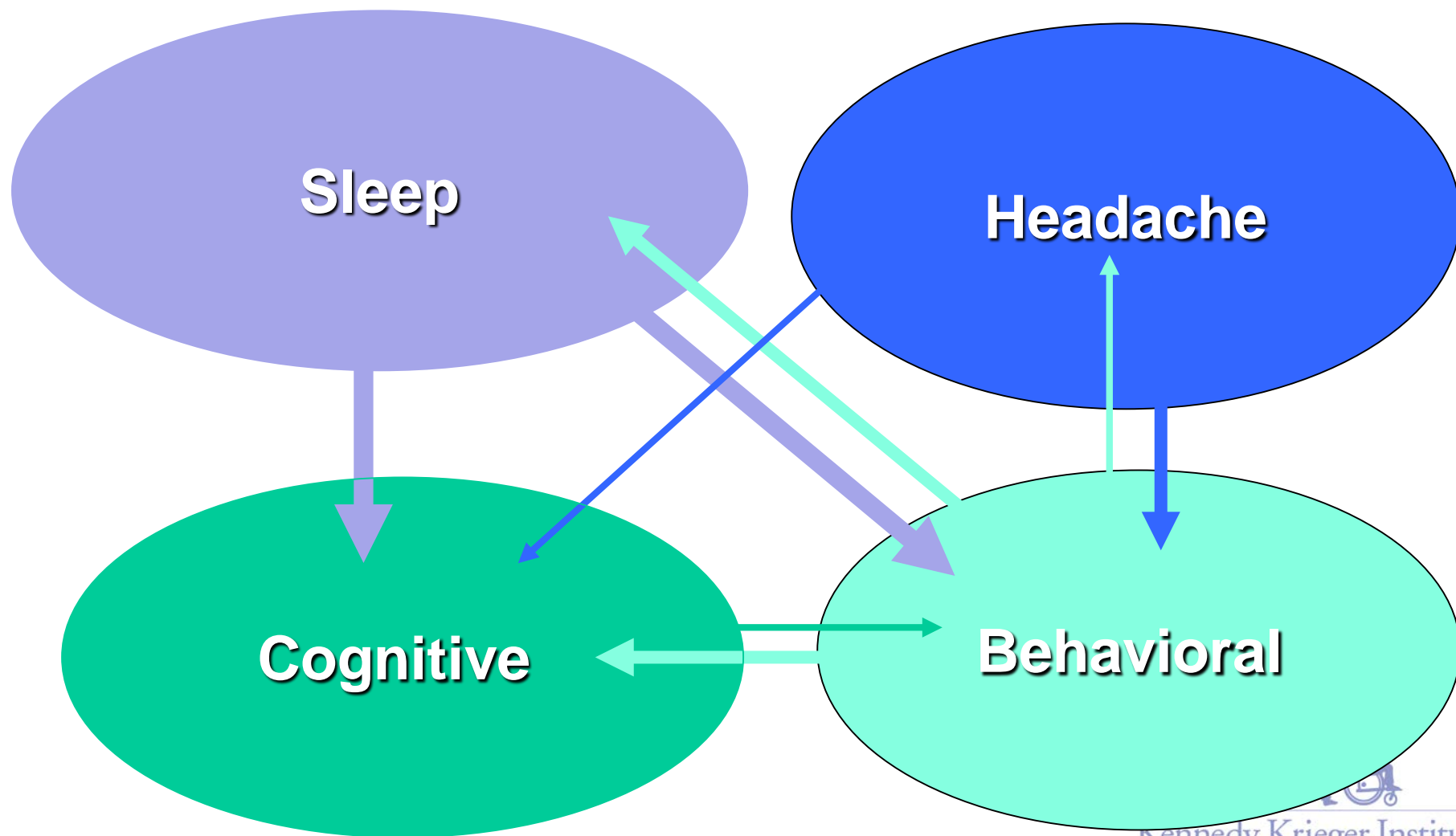


Concussion Symptom Domains



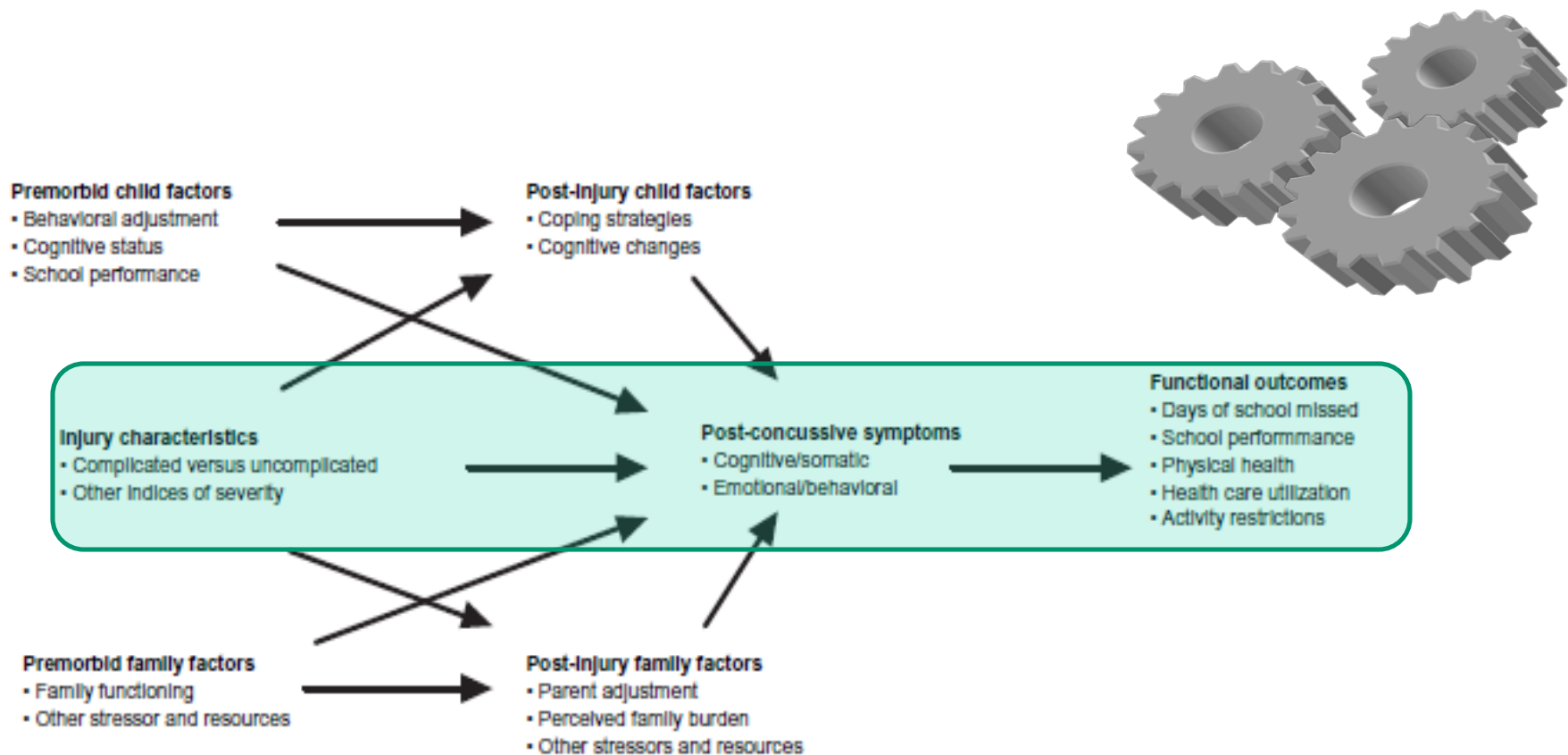


Clinical Considerations





Biopsychosocial Approach to Understanding Concussion



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Biopsychosocial Approach to Understanding Concussion



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What is Cognitive Behavioral Therapy? (CBT)

- A form of psychological intervention
- Helps patients identify and treat unhelpful thoughts, behaviors, and emotions
- In the medical setting, CBT is focused on treating thoughts, behaviors, and emotions which are negatively impacting coping, recovery, and daily functioning





Treatment Across Stages of Recovery

Acute

- Sleep/Rest Management
- Pain Management
- School/Sports Concerns
- Mood concerns

Post Acute

- Activity pacing
- Behavioral Activation
- Family/Social Impact

Prolonged

- Chronic Pain Management
- Re-integrating into school/social contexts
- Depression/Anxiety



Concussion Symptoms



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Post-traumatic Headache (PTH)

- One of the most common symptoms after concussion
- May not respond to medication alone
- Unresolved PTH can contribute to:
 - Cognitive difficulty
 - Disrupted daily functioning
 - Sleep disturbances
 - Decreased quality of life
 - Behavioral responses that inhibit recovery



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Sleep

- Among the most common symptoms of concussion
- Types of concerns:
 - Difficulty falling or staying asleep
 - Sleeping too much
 - Sleeping too little
 - Fatigue
 - Disrupted sleep patterns





Cognitive Concerns

- Fogginess/sluggishness
- Difficulty concentrating
- Easily distracted
- Decreased cognitive stamina
- Relationship between cognitive exertion and pain



A black and white photograph showing several hands stacked on top of each other, symbolizing support or unity.

Mood

- Symptoms of depression and anxiety are common and can increase complaints of cognitive and other post-concussive symptoms
- In adults, mood symptoms can matter more than the injury itself when it comes to recovery trajectory
- Mood symptoms can impact pain experience, sleep, and daily functioning



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Concussion as a Magnifying Glass



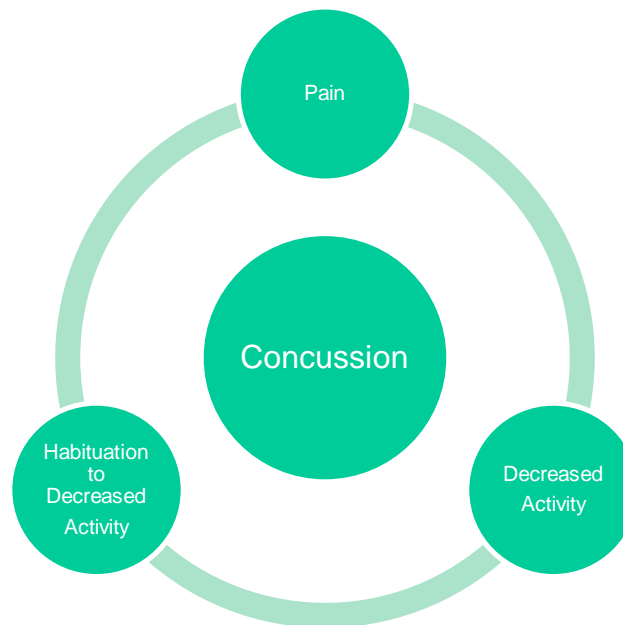
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Return to Learn/Play

- Cycle of pain and inactivity
 - “Decreased activity in response [to pain], can prevent normal restoration of function; perpetuate painful experience; and, in cyclic disability-producing fashion, reinforce avoidance, inactivity, and increased pain.” (Martelli et al., 1999)





“Overdosing” on Rest

- Utility of full rest > 3 days questionable (Silverberg & Iverson et al., 2012)
- Prolonged/ elevated symptoms in patients prescribed 5 days of rest following concussion (Thomas et al., 2014)

Considerations

- Standard school year = 180 days
 - 2-week absence = 5% school year or 22% qtr
 - 37% of CPS students who missed 5-9 days of school did not graduate in 4yrs (Allensworth & Easton, 2007)





Return to Learn/Play

- Pediatric patients often find themselves in either a state of inactivity or over-activity
 - Both can increase pain complaints and prolong recovery
- This is particularly important when considering return to school/sports





Family Coping

- Family coping can promote or inhibit recovery
- Kids need family support to implement treatment interventions
- Family functioning impacts school functioning



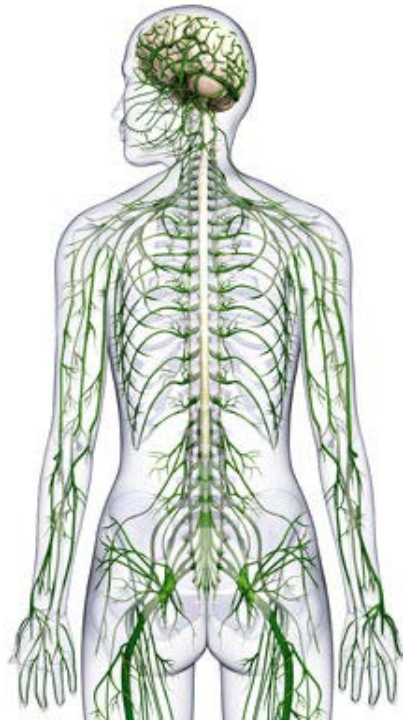
Concussion – What can we do about it?



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Pain Management



- Gate Control Theory of Pain
 - Gate-like mechanism which controls whether physical pain sensations reach the brain
 - Nerve fibers transmit pain signals to the dorsal horn
 - The dorsal horn (area in the spinal cord) opens and closes like a gate, deciding which pain signals get through to the brain



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Pain Management

- What opens the gate
 - Inactivity, poor pacing, long term narcotic use, stress, negative mood, negative thoughts
- What closes the gate
 - A sense of predictability and control, distraction, relaxation, physical activity, good sleep/wake cycle





Pain Management Psychology

- Diaphragmatic Breathing
- Progressive Muscle Relaxation
- Guided Imagery
- Patients are provided with tools for home practice
- Individualized preferred strategies are built upon over time
- Focus is on improving daily functioning





Toolbox - Sleep

- Structuring evenings and bedtimes
 - Homework!
- Education on healthy sleep habits
- Scheduling appropriate nap and wake times
- Families are asked to incorporate:
 - Consistent bedtime
 - Limiting electronic use before bed
 - Using bed only for sleep
 - Engaging in relaxation prior to bedtime





Toolbox – Activity Pacing

- Daily schedules for school and extracurricular activities
- Time management strategies
- Scheduling structured breaks during demanding activities
- Decreasing physical and cognitive accommodations over time





Toolbox – Behavioral Activation

- Increasing pleasurable activities and approved exercise
- Structuring daily activity, requiring increasing effort over time
- Identifying pleasurable activities for promotion of positive mood/coping
- Examining thought patterns around pain and shifting to more helpful ways of thinking





Toolbox - Mood

- Participating in positive activities
- Promoting social engagement
- Identifying/using coping strategies
- Exploring ways to adjust peer interactions
- Challenging unhelpful thinking patterns





Toolbox – Executive Functioning

- Organizational strategies for balancing makeup work
- Strategies for communicating needs and structuring expectations with teachers

Essential Assignments

Class: _____ Teacher: _____

Assignment	Deadline 1	Deadline 2	Deadline 3	Deadline 4	Due Date	Teacher Initials	Student Initials
Final Assignment Due:							

Assignment	Deadline 1	Deadline 2	Deadline 3	Deadline 4	Due Date	Teacher Initials	Student Initials



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Toolbox – School Supports

- Access to water (and bathroom!)
- Flash pass to nurse/guidance
- Planned breaks
- Excusing non-essential makeup work
 - Every other problem
 - Getting creative about testing knowledge
- Decreased homework (not forever!)





Toolbox – School Supports

- Gradual re-entry
 - To school and to classes
 - Example: band
- Point person for planning
- Identifying the “window”





But What if I Don't Buy It?



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Case Example



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“Hayden”

- 16yo male
- Sustained injury in helmet-to-helmet collision in football game
- Premorbid:
 - Average/low average student
 - “class clown”
 - History of anxiety





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Thank you for your attention!

Questions?

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