Patient Symptom Interpretation, Interoception, Physiological Arousal, and Interventions

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15-20% of Adult and 30% of Adolescent Pt Sx Persist > 1mo

Pre- and post-injury mental health problems are the strongest established contributor to poor recovery and functional limitation after mTBI. *Silverberg et al (2015), Zahniser et al (2019)*

Pre-morbid somatic symptom scores found to be strongest predictor of post-concussive symptom duration. *Nelson et al (2016)*

Even when controlling for pre-morbid mental health, Pts with heightened post-concussive and global somatic symptoms were associated with prolonged recovery from mTBI. *Stubbs et al (2020)*

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Dodo Bird: All have won, and all must have prizes.

(MacLeod, 2010)

PCS Sequelae & Etiology

Neurogenic

- Symptoms are a direct and exclusive result of nervous system injury
- Chiefly relevant in early stages

Psychogenic

- Symptoms are a psychological response to the stress of injury
  - Iatrogenic persistence of symptoms
    - Well meaning but overly vigilant medical attention
  - Nocebo effects
  - Expectancy effects

Multiple insults to neurocircuitry

- 1st --Mechanical trauma (injury)--Neurogenic
- 2nd -- Maladaptive, reinforcing psychosocial and neuroendocrine stress--Psychogenic

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Interoception & Sociocultural Concussion Fears are Kindling for Somatization

Interoception: your brain's perception of your body's state, transmitted from receptors on all your internal organs

Somatization: Psychological distress manifests as physical symptoms, which can occur in the presence or absence of organic pathology.

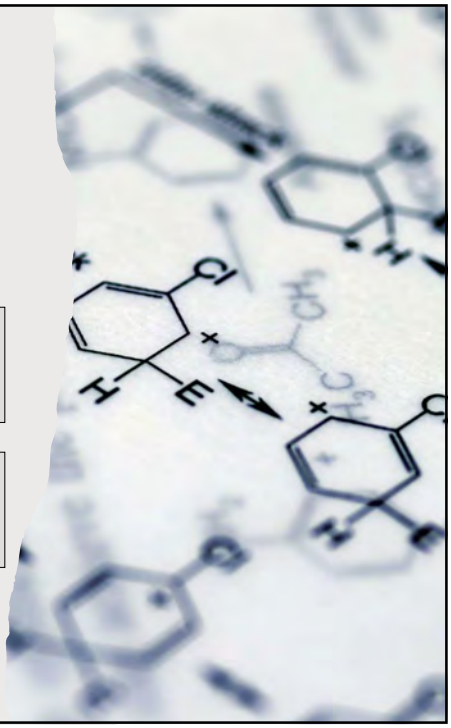
Moore et al (2017) PCS symptoms are very similar to those experienced by people with chronic pain and other (neuro)psychological difficulties in the absence of mTBi.

- Reflects general psychological mechanisms contributing to and maintaining PCS.

Somatic Symptom Disorder: is characterized by multiple persistent physical complaints that are not feigned and are associated with excessive and maladaptive thoughts, feelings, and behaviors related to those symptoms.

- Physical concerns are converted into physical symptoms.

Be Careful About What You Are Thinking, Your Body is Always Listening



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PCS Due to Anxiety/Depression/Somatization is a Rule out Condition

Assess Risk Factors for Psychological Vulnerability

Multi-dimensional management (MM)

- Rule Out Other Physiological/Neurological/Vestibular Pathology
- Ongoing Assessment and Evaluation by Treatment Team (holistic)
- Global process in which features interact with one another

Implement all standard treatments

- Vestibular Therapy
- Physical Therapy
- Nutritional Therapy
- Neuropsychological assessment
- Psychotherapy

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Prevention: Evaluating Risk, Identification, and Early Intervention

- Hx of mental illness
- Elevated anxiety sensitivity
  - Fear of the sensations and experiences associated with a stress/anxiety response
  - Physical, Cognitive, Social
- Personality
  - Neuroticism (predisposition towards negative mood states)
  - Hypervigilence
  - Obsessionality
  - High internal locus of control
- Secondary gain

Caze et al (2021, 2022)

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Treatment Options

- Unconditional Positive Regard
- Psychoeducation
- Mindfulness Based Somatic Sensory Techniques (Expansion)
- Autogenic Training
- HRV Biofeedback
- Cognitive Interventions

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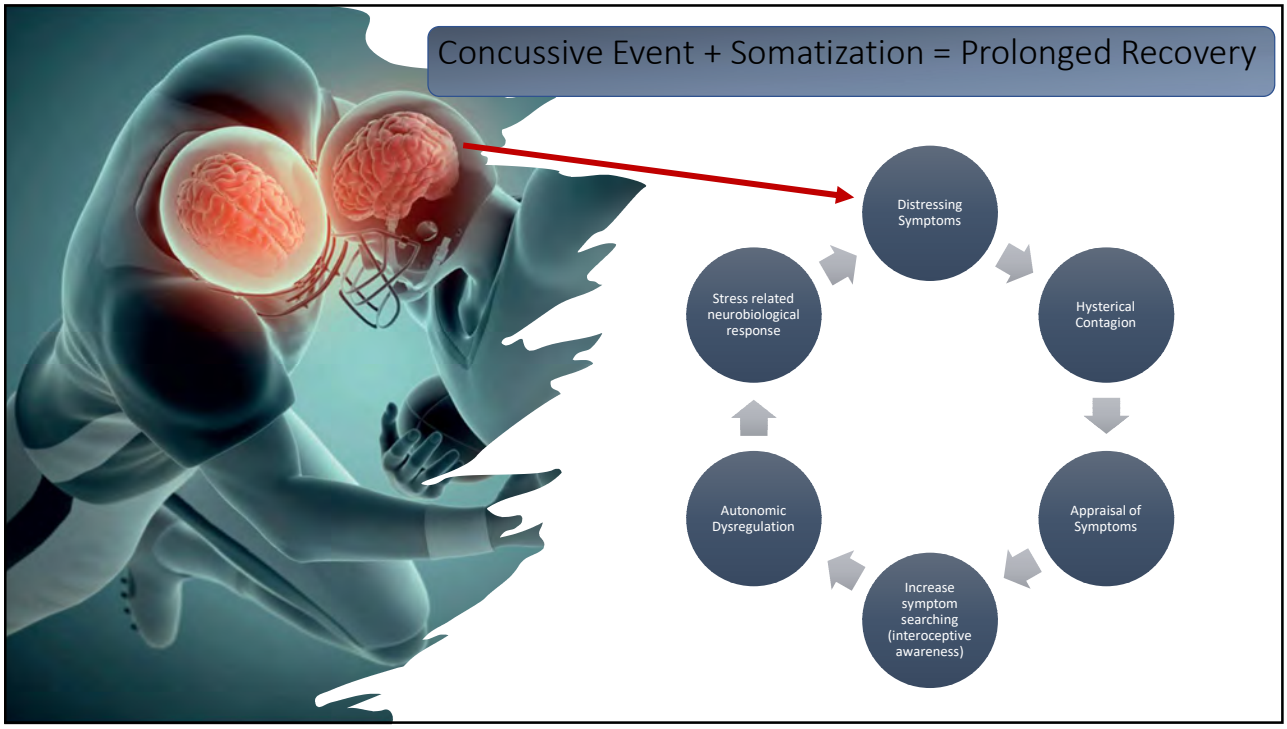

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Support + Education

Unconditional Positive Regard

- Symptoms are valid not feigned
- Invalidation will exacerbate symptoms
- Patient needs to experience their symptoms as being taken seriously by the healthcare team

Psychoeducation

- Education of symptoms and progression to reduce negative perceptions
- Re-attribution: often source of symptoms has been misattributed
- Help patient understand all possible sources of symptoms
- Offer all relevant treatment options
- Emphasize the importance of autonomic regulating treatments regardless of etiology
- Empower patient cultivating internal locus of control
- Diffuse negative stereotypes

Moore et al (2017)

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Managing the stress response: Target ANS Dysregulation

Mindfulness based somatic sensory exercises (expansion)	Cultivate experiential non-judgement and acceptance to reduce emotional rigidity and exaggerated sympathetic activation in response to symptoms
HRV Biofeedback	Helps improve interoceptive accuracy Increases autonomic symptom control Regulates mood and emotions
Autogenic Training	Uses kinethetic imagery and visualization along with deep breathing to downregulate muscle tension Activates parasympathetic response Calm, warm, heavy

HeartMath

Official P

Calm

Pertab et al., 2018; Kim et al., 2013; Lagos, Thompson, & Vaschillo, 2013; Condor and Condor (2014)

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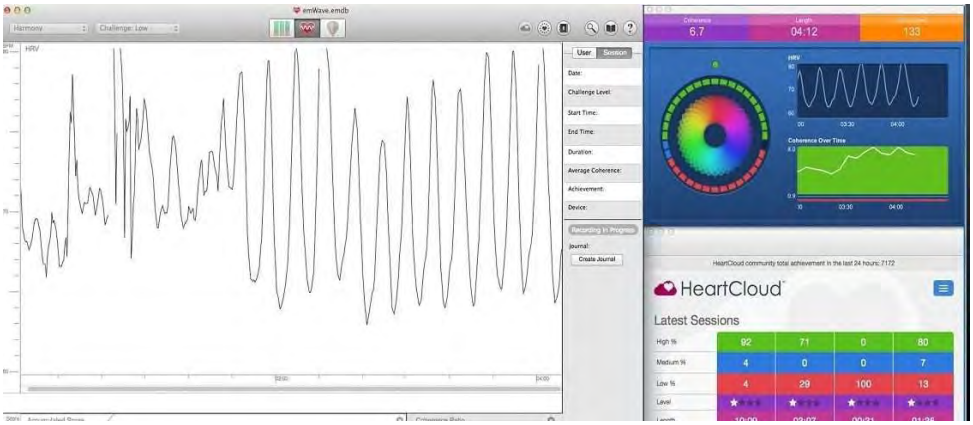
HRV Biofeedback

- Empowerment via Neurophysiological Control



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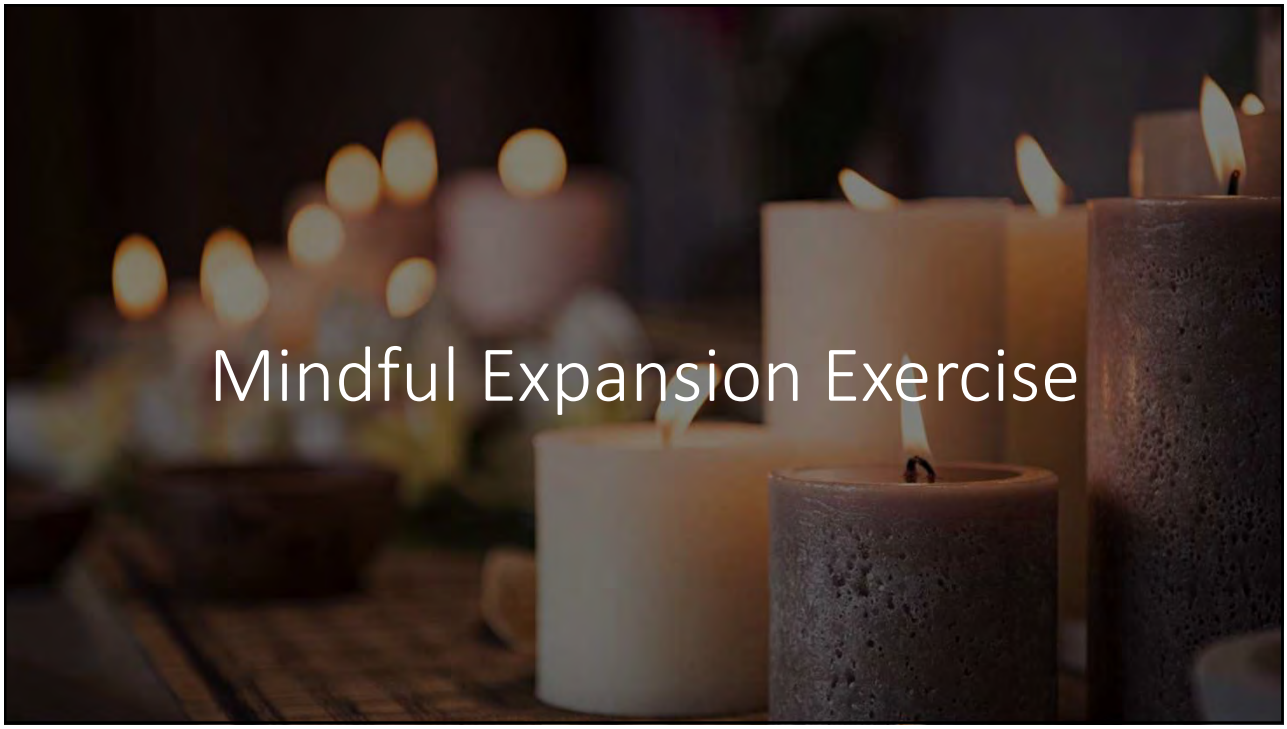

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Compassionate and Firm

Normalize Discomfort and Do the Things!

Cognitive Interventions

- CBTi
  - Sleep hygiene
  - Stimulus control
  - Cognitive reframing
- CBT and ACT for Mood and Anxiety
  - CBT for Addressing misattributions
    - Autonomic Education
    - Identifying distortions
    - Re-attribution (reframing)
    - Exposure
    - Behavioral experiments
  - ACT for addressing fixation
    - Normalize presence of and tolerance for uncertainty
    - Reduce experiential avoidance
    - Acceptance
    - Non-judgment
    - Present-focused awareness
    - Value driven decision making

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- I may never be myself again.
- I'm afraid of what might happen if I get another concussion.
- I don't feel like anyone really understands what this feels like.
- If I wouldn't have _____, then this wouldn't be happening.
- If I do _____, I will feel terrible.
- I'm just not myself anymore.

- If I can calm my body, my brain will also feel better.
- What can I control today.
- Let's try it and see how I feel.
- Most feelings/sensations change with time.
- I cannot change the past or future, I can only take care of this moment.
- What skills could I use to get through this?
- If I continue to try things my brain will keep healing even if it feels uncomfortable for a little bit.
- Some of my symptoms are a response to my worry. If I control my worry I will help my symptoms.
- ***I'm going to reduce my productivity expectations and emphasize my recovery expectations. Choose where to work hard. Process > Outcome***

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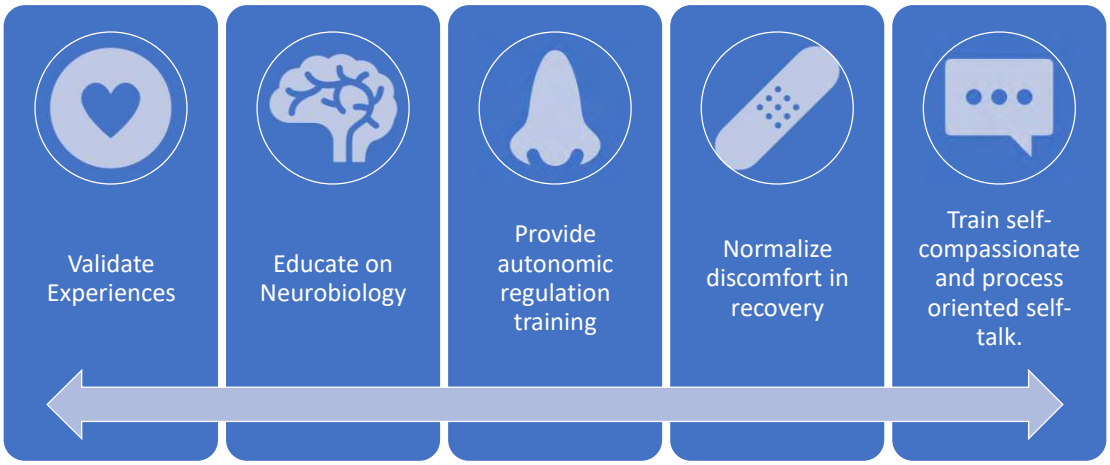
Psychological Care for Concussion Take-Aways



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