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Traumatic Brain Injury: Rehabilitation

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Dr. Diana Davis is an Associate Professor in the Division of Occupational Therapy at West Virginia University. She received her bachelor's degree in Occupational Therapy from Western Michigan University and her Master and Doctoral degrees in Interdisciplinary Education, Higher Ed Leadership from WVU. Dr. Davis has 30 years' experience in in clinical occupational therapy practice focusing on acute care intervention for individuals with acquired and traumatic brain injury. Her research has focused on return to participation in life roles for individuals with brain injuries with a recent focus on the effects of a concussion on occupational performance. Dr. Davis has co-authored several publications with Drs. Acord-Vira and Wheeler on brain injury and concussion. She currently serves as the Representative for WV to the AOTA Representative Assembly and as served as President of the West Virginia Occupational Therapy Association fin the past.

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Learning Outcomes

After this course, participants will be able to:

- Identify areas typically assessed during the inpatient rehabilitation phase of recovery.
- Identify common client factors and skills that are addressed in the inpatient rehabilitation setting (IRF) or skilled nursing facility (SNF).
- Identify evidence-based interventions to address BADL's, Communication, Neurobehavioral deficits, and client factors in the IRF or SNF.
- Identify strategies to address challenging behaviors that often occur in the IRF or SNF
- Identify effective client and family/caregiver education to support the rehabilitation process and client function.

Introduction to Rehabilitation

- Can occur in a variety of settings including an inpatient rehabilitation facility or skilled nursing facility
- Rancho Levels most commonly seen during the inpatient phase of recovery
  - Often admitted at Level III or IV
  - Often discharged at Level VI or VII to home or community-based options for rehabilitation

Rancho Los Amigos

- Level I:No Response (Total assistance)
- Level II: Generalized Response (Total assistance)
- Level III: Localized Response (Total assistance)
- Level IV: Confused- Agitated (Maximal assistance)
- Level V: Confused Inappropriate Non agitated (Maximal Assistance)
- Level VI: Confused Appropriate (Moderate Assistance)
- Level VII: Automatic Appropriate- (Minimal Assistance for Daily Living Skills)
- Level VIII: Purposeful and Appropriate (Standby assistance)
- Level IX: Purposeful/Appropriate (Standby on request)
- Level X: Purposeful/Appropriate (Modified Independent)

Rancho Los Amigos Revised Level IV

- Confused/Agitated: Maximal Assistance
  - Alert and heightened state of activity
  - Attempts to remove tubes and restraints
  - Non-purposeful activity
  - Absent short-term memory
  - Out of proportion responses (e.g., cry, scream)
  - Aggressive behavior may be seen
  - Incoherent and inappropriate verbalizations

  - www.myshepherconnection.org

Rancho Los Amigos Revised Level V

- Confused, Inappropriate Non-Agitated: Maximal Assistance
  - Increased consistency with following simple commands
  - Short-term memory impaired
  - Alert and agitation has decreased (e.g., agitation occurs with increased stimulation and lack of structure)
  - May wander and wants to go home
  - Not oriented to person, time or place
  - Inappropriate use of items
  - Sustained attention for brief periods, unable to learn new information but may be able to perform previously learned tasks
  - www.myshepherconnection.org

Rancho Los Amigos Revised Level VI

- Confused, Appropriate: Moderate Assistance
  - Inconsistently oriented
  - Consistently follows simple commands
  - Attention to familiar tasks up to 30 minutes with redirection
  - Able to learn new material with maximal assistance and supervision for old learning
  - Goal directed behavior
  - Past memory better than recent, max assistance to use an assistive memory aide
  - Emerging awareness of appropriate responses
  - www.myshepherconnection.org

Rancho Los Amigos Revised Level VII

- Automatic, Appropriate: Minimal Assistance for Daily Living Skills
  - Consistently oriented
  - Able to attend to familiar tasks with minimal assist
  - Appears appropriate
  - Automatic actions
  - Difficulty with change and unexpected events
  - Lacks insight
  - Decreased judgment, problem solving, and superficial self-awareness
  - Unrealistic and uncooperative, unable to recognize inappropriate social interaction behavior
  - www.myshepherconnection.org

Evaluative Approach

- Top Down Approach
  - Start with participation restrictions or roles the client is having difficulty completing
  - Proceed to activity limitations or difficulties in occupations or tasks
  - Evaluate performance skills and client factors including body structure and function
  - Appreciation that a presence of impairment doesn't mean a limitation
- Bottom Up Approach
  - Start by looking at performance skills and client factors
  - Work up to roles
  - May work best with low level clients

Data from Evaluation

Objective/Standardized

- Data is measurable
- Information is free of bias, observable, and factual
- Also collected using assessments, tools or instruments
- Important for documentation, establish baseline
- Can be more difficult to obtain with clients functioning at lower levels

Subjective/Non-standardized

- Can be influenced by bias, is experienced by the client, or is not impartial
- Typically gained from perception of a situation/ observations
- Requires interpretation and clinical reasoning
- Important for documentation, establish baseline
- Necessary to capture information you are unable to obtain with objective measures

Considerations for Assessment

- Extent or severity of injury
- Level of consciousness and arousal level
- Type of deficits or impairments:
  - Motor
  - Sensory
  - Cognitive
  - Behavioral or Emotional
  - Language

Comprehensive SLP Assessment

- Speech-Language Assessment
  - Non-speech examination
  - Speech production
  - Language
  - Cognitive
  - Communication
  - Swallowing
- Audiologic and Vestibular Assessment
  - Behavioral Hearing Testing
  - Auditory Processing
  - Vestibular Testing

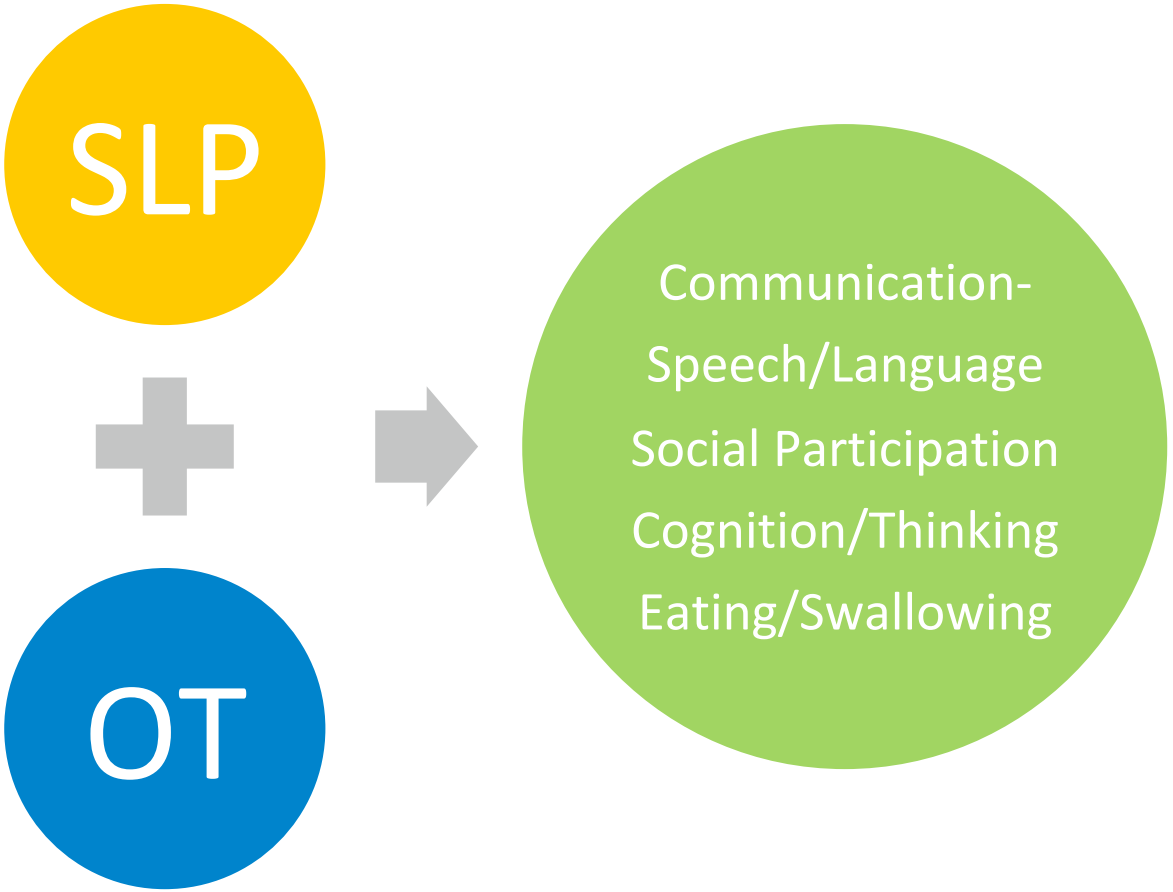
American Speech-Language-Hearing Association , 2020

Comprehensive OT Assessment

- Occupational Profile
- Occupations
  - ADL's, IADL's, Heath management, rest and sleep, education, work, play, leisure, social participation
- Contexts
  - Environmental factors and personal factors
- Performance Patterns
  - Habits, routines, roles, rituals
- Performance Skills
  - Motor skills, process skills, social interaction skills
- Client Factors
  - Values, beliefs and spirituality, body functions, body structures

AOTA, OTPF, 2020

Similarities between Professions



General Principles

- Develop routine and schedule
  - Sleep schedule/breaks
  - Consistency
  - Approximate their previous life
- Positioning to increase attention
  - Specialized equipment
- Contextualized therapy

Routines

- Create a daily schedule/routine that provides structure and consistency (e.g., morning, meals, chores, personal, work, bedtime)
  - Promotes organization and independence skills
  - Improves wake/sleep schedules
  - Assists with memory (e.g., notebook, phone)
  - Assist with managing difficult behaviors
- Give choices and encourage participation in development of the routines

(Dougherty, P., & Radomski, M.)

Impact of Sleep Disturbance

- Impedes recovery (Kalmbach et al., 2018) and adversely affects health and wellbeing (Bogdanov et al., 2016).
- Restricts the rehabilitation process (Bogdanov et al., 2016).
- Impacts mood and pain (Fedele et al., 2019)
- Associated with slower functional recovery and poor outcomes (Fleming et al., 2020)

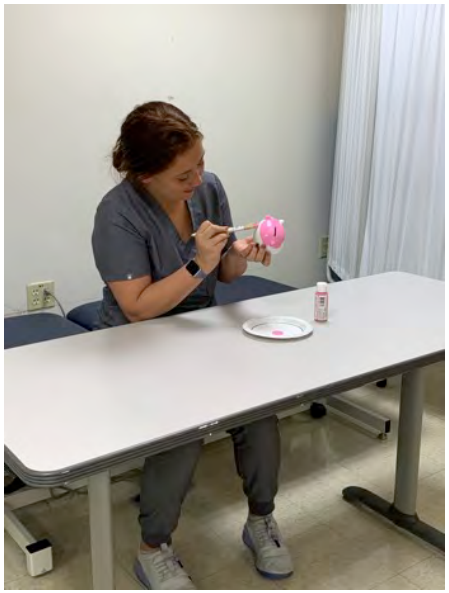
Sleep Hygiene Interventions

- Develop a bedtime routine
- Use planner to schedule waking hours
- Work with pharmacist/physicians to manage medications
- Meditate before bed, mixed evidence regarding exercise
- Cognitive Behavioral Therapy (CBT) can improve sleep quality and daily fatigue levels (Nguyen, et al., 2016)

(Dubas, E. 2018; De La Rue-Evans, Nesbitt, & Oka, 2012)

Positioning

- Increases attention
- Sitting edge of mat or bed
- Standing
- Tilt table
- Standing frame



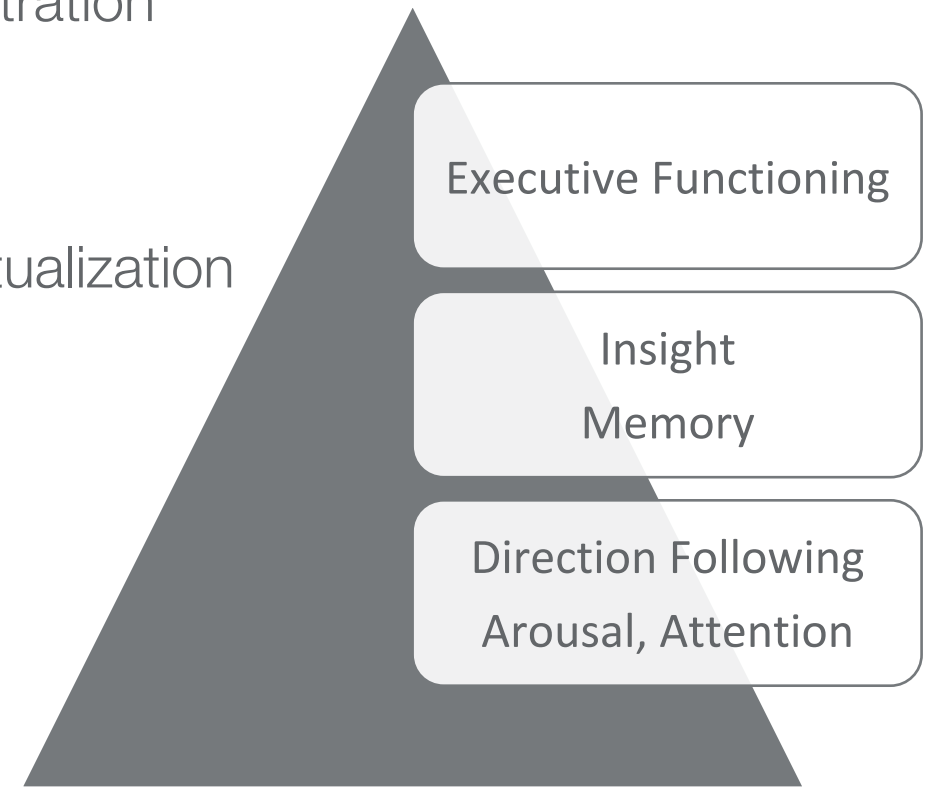
Contextualized Therapy

- Holistic
- Real life activity interventions
- Tasks are meaningful to the individual
- Leads to better outcomes
  - Greater community participation 1 year later

(Bogner et al., 2019)

Cognitive Impairments

- Impaired attention and concentration
- Easily distracted
- Impaired orientation
- Impaired visual spatial conceptualization
- Slow processing speed
- Impaired memory
- Communication disorders
- Poor judgement
- Poor executive functioning



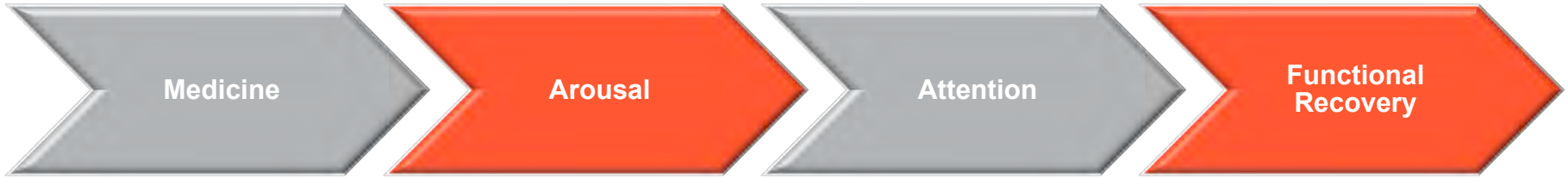
- (Barman, Chatterjee, & Bhide, 2016)

General Factors that Affect Cognition

- Sensory loss
- Perceptual difficulties
- Age
- Sleep disorders
- Depression
- Medication
- Chronic diseases
- Positioning-sitting vs. supine vs. standing

Attention

- Types
  - Sustained
  - Selective
  - Alternating
  - Divided



  - (Giancino et al., 2012)

Attention Interventions

- Specific skill training
- Direct attention training program (e.g., visual, auditory)
- Alterations to the environment
  - Reduce distractions, reduce speed, prompts, repetition
  - Positioning (e.g., sitting edge of mat, tilt table, standing frame).
- Training in dual tasking
- Sleep schedules
- Metacognitive strategy and CBT- level of severity and higher rancho levels
- (Barman et al., 2016; Ponsford et al., 2014)

Processing Speed

- Unable to answer questions or formulate ideas in a timely manner
- Need time to process command before moving on or repeating
- Adequate time to formulate response
- Can often be missed by new clinicians

Distractibility

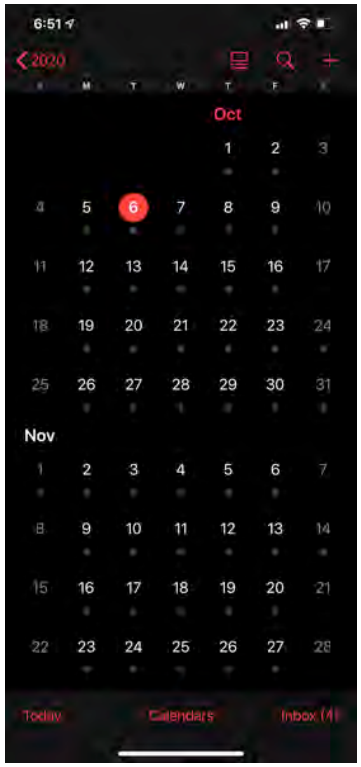
- Difficulty remaining on one task for a given amount of time
- Require a lot of verbal cues
- Require decrease of external stimuli
- Require therapist to be direct, consistent and follow through

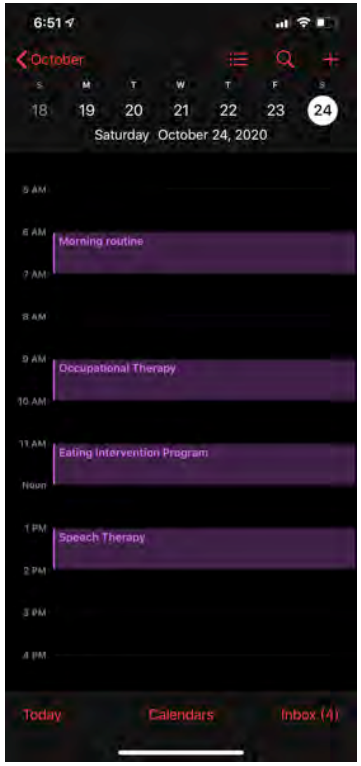
Memory

- One of most common impairments after TBI (Rees et al, 2007)
- Restorative (Tsaousides et al., 2009)
  - Also known as remedial, impairment focused
  - Examples (word list, paragraph listening, visual imagery, mnemonic strategies)
  - Repetitive exercise
  - Efficacy of these strategies is weak (Velinkonja et al., 2014)
- Compensatory
  - Adaptation to the environment to emphasize the client's capabilities(Cicerone et al., 2011)
  - Use of internal and external compensatory memory strategies supported by evidence (Velinkonja et al., 2014)

Memory Interventions

- Environmental supports and reminders
  - Requires training of the individual, caregivers and support staff
  - External memory aides (e.g., Smartphones, notebooks, whiteboards)
  - System of cues or prompts can assist individuals with remembering to use the supports





Interventions for Memory

- INCOG Recommendations (Velinkonja et al., 2014)
  - Define goals
  - Break down tasks (e.g., task analysis)
  - Allow time to process
  - Distributed practice (form of spaced retrieval)
  - Variations in stimuli
  - Visual imagery or verbal elaboration
  - Constrain errors (e.g., errorless learning, spaced retrieval)

Errorless Learning

- To be used in earlier stages especially with severe memory impairment
- Task is clearly defined, specific information or procedures
- Errors are corrected immediately or prevented from occurring

- (Barman et al., 2016)

Managing Challenging Behaviors

- Agitation
  - Wondering
  - Edginess
  - Distractibility
  - Non-compliance
  - Impulsive
- Aggression
  - Physical violence
  - Verbal violence
  - May put themselves or others at risk for injury

Managing Challenging Behaviors

- Disinhibition
  - Unable to monitor and regulate socially inappropriate impulses and behaviors
  - Dress and speak in a socially inappropriate way
  - Sexually inappropriate

Managing Challenging Behaviors

- Behavior Medicine/Psychology
- Medications
- Develop daily schedule
  - Provide choices in daily schedule
  - Avoid open ended choices
  - Sleep Routines
- Environmental modifications
  - Decrease stimulation that may be increasing behaviors
- Establish behavioral modification program
- Music therapy
- Sitter, bed enclosures, wrist/ankle restraints

Managing Challenging Behaviors

Relational Neurobehavioral Approach

- Manage aggression without use of seclusion or mechanical restraint (Kalapatapu & Giles, 2016)
  - Aggression ignored
  - Talking to the client
  - Reassurance
  - Physical distraction
  - Isolation without seclusion
  - Immediate medication by mouth
  - Holding client

Eating vs. Feeding

- Eating
  - Keeping food in the mouth
  - Chewing and grinding
  - Swallowing
- Feeding
  - Hand to mouth
  - Opening containers
  - Cutting food
  - Holding cups
  - Using utensils

Dysphagia

- Difficulty with swallowing (component of eating)
- Common after a TBI
- High risk practice area
- Requires team approach
- Interventions:
  - Eating intervention program
  - Compensatory postures
  - Altered food textures
  - Liquid consistencies
  - Prevention strategies

Eating Intervention Programs

- Focus on feeding and eating
- Proper positioning
- Use of adaptive equipment
- Dysphagia strategies
  - Techniques
  - Modalities


EXIT
DEER PARK

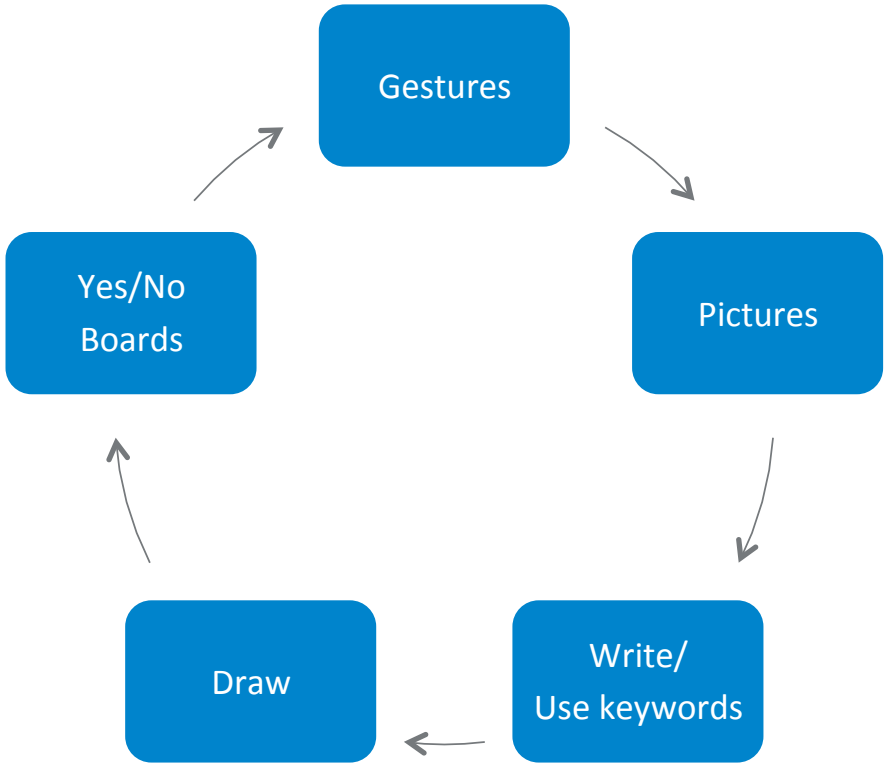
Communication Impairments

- Severe communication disorders
- Aphasia
- An impairment of language
- Expressing or receiving communication
- Being observant of facial expressions and non-verbals
- Affects the ability to:
  - Write
  - Talk
  - Read
  - Understand

(Togher et al., 2014)

Communication Aides

- Alternative and augmentative devices
- Unaided or Aided
- Low tech or high tech



Family/Caregiver Training

- Daily schedules/routines
- Equipment needs
- Communication strategies
- Engagement in activity
- Access to resources (e.g., support groups, state-wide programs)
- Life Coach

Special Considerations

- Religious influences
- Cultural influences
- Psycho-social status
- Substance abuse:
  - Coping
  - Cravings
- Depression & anxiety
- Other significant injuries
- Pandemics

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