

ROLE OF NEUROPSYCHOLOGICAL CONSULTATION AND EVALUATION IN CONCUSSION MANAGEMENT

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Clinical Neuropsychology

Applied science concerned with the behavioral expression of brain dysfunction.

Neurology focuses on BRAIN

Neuropsychology focuses on the MIND or how the brain interacts with the world.

Purposes: Diagnosis/Description

Management and Planning

Treatment

Research

General Cognitive Functions

- Receptive—select, acquire, classify and integrate information
- Expressive—means through which information is communicated or acted on
- Memory and Learning—information storage and retrieval
- Thinking—mental organization and problem solving

Areas of Cognitive Functioning

- Intellectual functions (verbal and visual-spatial)
- Academic skills
- Attention/Concentration (auditory, visual, immediate and sustained, vigilance, tracking and processing speed)
- Learning and Memory (immediate, delayed, recall and recognition)
- Emotional status (appraisals, self-talk, coping)

Neuropsychological Evaluation

- Clinical Interview (history and background)
- History of presenting injury/symptoms
- Current symptoms (physical, emotional, cognitive)
- Psycho-social status (life context, family, sources of stress and support)
- Neuropsychological or neurocognitive testing

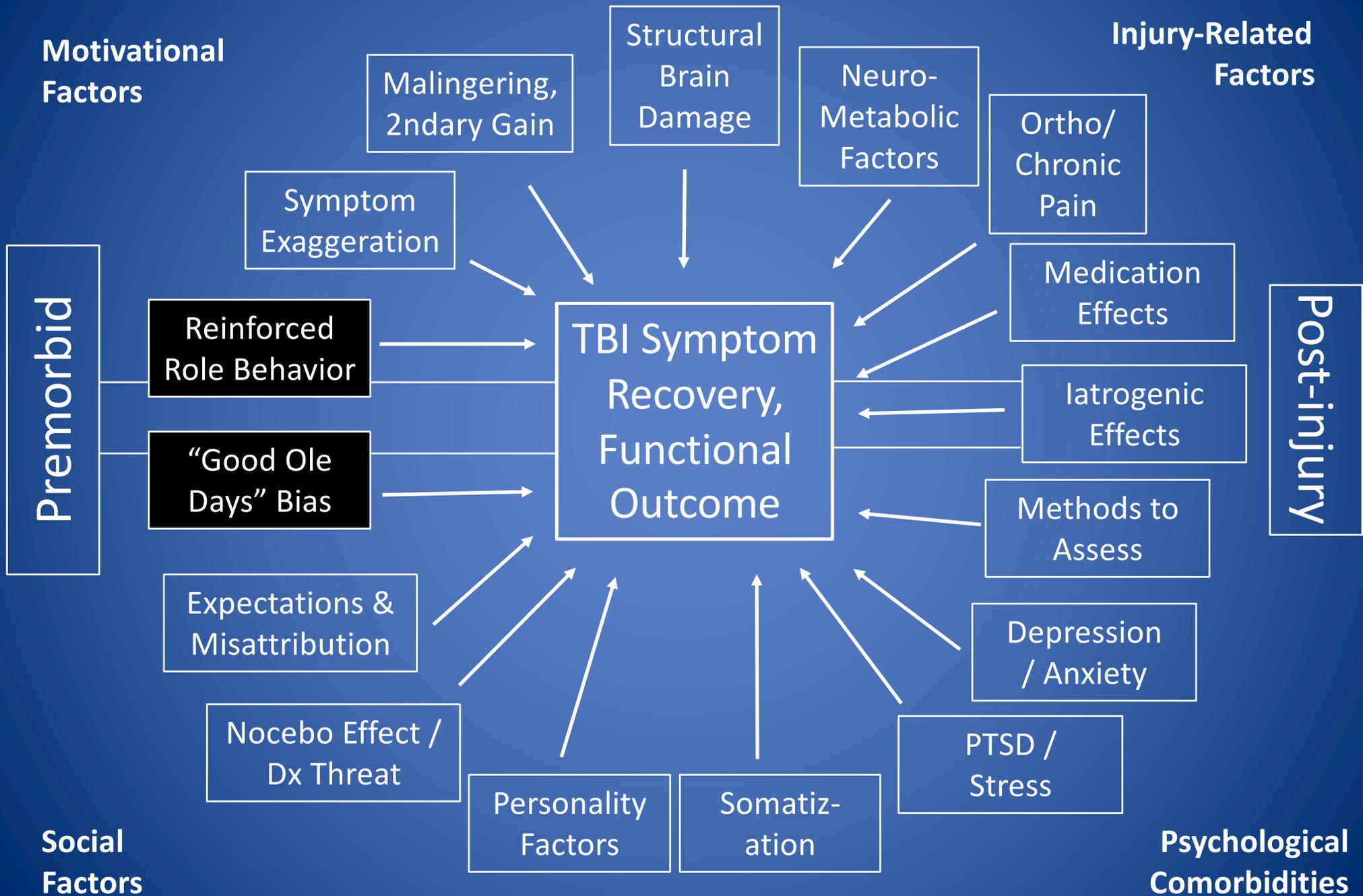
Concussion Evaluations

- Neurocognitive screenings, not usually comprehensive neuropsychological evaluations
- Trend toward hybrid approach with both in-person testing and computerized testing being used
- Sequential testing—multiple form tests
- Expanded testing or more comprehensive testing may be needed for multiple concussion athletes or complicated histories or co-morbidities
- Can address cognition AND psychological sequelae
- Provide focus on neuroPSYCHOLOGY

Evaluation Report

- Describe pattern and range of performance
- Validity of testing—effort concerns and reliable change assessment
- Is pattern consistent with HPI and current symptoms?
- Integrate neurocognitive findings, medical data and psycho-social-emotional factors
- Factors: 5P's: **P**redisposing, **P**remorbid, **P**recipitating, **P**rolonging, and **P**rotective

Factors Influencing Recovery and Outcome After TBI



Sports Concussion Issues

- Emotional symptoms are often overlooked and may have a role in prolonged recovery
- Loss of esteem and identity and resultant emotional status during recovery can influence cognitive performance
- Concussed athletes are often deprived of physical outlet during recovery which can increase stress
- Return to baseline may not equal recovery
- Good recovery may not change risk

Testing Issues

- Proper/valid administration and interpretation
- Potential influencing factors—effort and motivation, visual issues, premorbid conditions, medications
- In-person testing vs Computerized testing or hybrid approach
- Computerized testing—group testing at baseline and individual testing at followup; provide information but do not diagnose concussion as stand-alone test
- Important to have well-controlled testing environment and trained administrators
- Can't interpret test results in vacuum
- Musculoskeletal injuries/pain can produce a degree of cognitive disruption such as slowed processing

Overwhelmed
Stressed
Increased panic
Increased sadness/hopelessness
Increased frustration

Mood

Thoughts

"It's the concussion"

"Something's wrong with my brain"

"Why did this happen to me?"

"I'm never going to get better"

"I'm not as smart as I used to be"

Behaviors

Increased second guessing

Increased small mistakes

Decreased attention

Decreased focus

Increased studying (often inefficiently)

Normal memory lapses (retrieval)

Decreased social time

Physical State

Increased muscle tension

Decreased sleep

Increased heart rate/racing

Increased arousal/vigilance

Headache

Thoughts about testing

- One needs to think more about the nature of the brain which was injured than the nature of the brain injury (Carson, 2017)
- What has initially been based in physiogenic disturbance readily thereafter becomes prolonged, and nonetheless disabling, by virtue of a complicated interplay or psychogenic factors (Lishman, 1997)
- The cognitive examination is not just a case of assessing mean scores on cognitive tests but actually understanding and interpreting what the scores really mean (Carson, 2017; Stone et al, 2015)

Computerized Testing

(e.g. ImPACT, Axon, CVS, ANAM)

Positive

- Quick easy administration for groups/teams
- More accurate timed responses
- Potentially more consistent administration
- Immediate results
- Good for data collection

Negative

- Mixed reliability data
- Possible technology errors with hardware/software
- No neurobehavioral observations
- Sampling of cognitive functions
- No auditory processing
- Recognition memory not recall
- Variable interpretation

Roles of Neuropsychology (NP) in Concussion Care

- In some instances, NP can be involved in acute assessments, but more often in sub-acute and chronic/persistent symptom time frames
- Address Cognition and Psychological sequelae
- NP based feedback about test results can serve as intervention promoting recovery and reassurance
- Increase knowledge/education regarding symptoms (causal attributions) and future outcomes
- Interventions such as CBT for sleep, anxiety, depression symptoms

Questions?

Thank you