Cognitive Assessment and Rehabilitation in mTBI Patients

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Disclaimer

The views expressed in this presentation are those of the presenters and do not reflect the official policy of the Department of Navy, Department of Defense, or U.S. Government.
Challenging Co-morbidity

PTSD
- Flashbacks
- Avoidance
- Hypervigilance
- Nightmares
- Re-Experiencing

TBI
- Cognitive Deficits
- Irritability
- Insomnia
- Depression
- Fatigue
- Anxiety

Polypharmacy

Pain/Suffering

- Headache
- Light/Noise Sensitivity
- Nausea & Vomiting
- Vision Problems
- Dizziness

Pain/Suffering

Polypharmacy

PTSD

TBI
Common Symptoms in Patients Being Assessed for mTBI

- **Cognitive Limitations**
  - Difficulty with memory, concentration, and attention
  - Delays in processing speed and executive functioning
  - Difficulty with dual tasking and word finding
  - Speech fluency
  - Pragmatic Language

- **Vision Limitations**
  - Accommodation Insufficiency
  - Convergence
  - Double vision

- **Hearing Limitations**
  - Tinnitus
  - Decreased loss of hearing in noisy environments

- **Vestibular Limitations**
  - Balance problems
  - Dizziness

- **Psychiatric Limitations**
  - Hypervigilance
  - Depression
  - Anxiety
  - Irritability/Anger
  - Apathy
Speech Pathology Evaluation

- **Language**
  - Boston Naming Test
  - WJ III COG: Rapid Picture Naming, Verbal Comprehension
  - WJ III Tests of Achievement
  - Word fluency

- **Speech**
  - Oral Motor Exam
  - Speech Articulation
  - Speech fluency: Stuttering Severity Instrument, 4th Edition

- **Attention/Concentration**
  - The Test of Everyday Attention
  - Attention Process Training Test
  - WJ III COG

- **Memory**
  - Rivermead Behavioral Memory Test, 3rd Edition
  - Repeatable Battery for the Assessment of Neuropsychological Status
  - WJ III COG

- **Executive Function**
  - Behavioral Assessment of Dysexecutive Syndrome
  - The Functional Assessment of Verbal Reasoning and Executive Strategies

- **Pragmatic Language**
Cognitive-Linguistic Treatment

- Effective Goal Setting with Patient
- Functionally-Based TX
  - Collaborate with AT
  - Study Skill Acquisition
  - High Level Attention Tasks
  - Mind/Body Techniques
- Role of Medication
- Barriers to Success
  - Chronic pain
  - Sleep disorder
  - Depression, anxiety
  - Dependence on family member
Auditory & Visual Attention

- Impacted by vision and hearing
- Input from neuro-optometry and audiologist
- Sustained/selective auditory and visual attention assessed using the Test of Everyday Attention (TEA)
Test of Everyday Attention: Selective Visual Attention
Test of Everyday Attention: Selective Visual Attention
Test of Everyday Attention: Sustained Auditory Attention

• Subtest 1: Elevator Counting
  ▫ Listen and count low tone beeps

• Subtest 2: Elevator Counting with Distraction
  ▫ Listen and count only the low tones that are intermixed with high tone beeps
Case Study: Impact of hearing on cognition

- 42 year old WM, active duty US Navy SEAL, diagnosed with mTBI secondary to multiple concussive events that occurred during combat missions, training, and sporting events; Anxiety; Depression; and, s/p ETOH abuse. Seen during NICoE 4 week program
- **Somatic complaints**: chronic pain, headache, dizziness, irritability, poor sleep, ringing in ears.
- **Cognitive-linguistic complaints**: memory, attention, word finding in conversation.
- **Brain MRI**: 3 small areas of T2 hyperintensity in bifrontal white matter. Mild cerebellar volume loss.
Speech Pathology Evaluation Results

• Executive function and sustained/selective visual attention were in the Average range.
• Memory (verbal & new learning), sustained/selective auditory attention, word retrieval/verbal fluency, and divided attention were in the Low Average range.
• Cognitive test results correlated with patient’s subjective cognitive complaints.
• Speech-cognitive therapy recommended as well as simultaneous tx of medical and psychological symptoms.
Audiology Evaluation & Recommendations

• Pure tone testing showed borderline-normal hearing sensitivity.
• The patient endorsed hearing problems in many listening situations along with bilateral tonal tinnitus
• Recommendations: Fit with binaural low-level, open-fit, hearing aids
Speech Pathology Follow-up

- Re-evaluation of selective attention using the TEA: Elevator Counting with Distraction subtest.
  - Raw score improved from 3/10 (SS in low average range) to 10/10 (SS in high average range) with use of hearing aids
  - Patient commented that he has to exert less energy/effort to attend during group discussions when wearing hearing aids

- Cognitive rehabilitation to improve complex attention, verbal memory, and speech articulation.