

CMSA-SCC Quarterly Meeting Lunch & Learn

Thursday, September 21, 2023

Presented by Case Management Society of America – Southern California
Hosted by Casa Colina Hospital and Centers for Healthcare



Does a Spinal Cord Injury Patient Need Neuropsychological Evaluation?

Elizabeth Preston Cisneros, Ph.D., QME
Clinical Director
Department of Neuropsychology and Psychology

Goals for Today

- Frequency of comorbid TBI with SCI
- Why TBI may be overlooked
- Cognitive deficits in SCI, other than TBI
- Role of neuropsychologists in interdisciplinary rehab
- What a neuropsychological evaluation is, what it covers
- When a neuropsychological AME/IME may be warranted in a medical-legal case



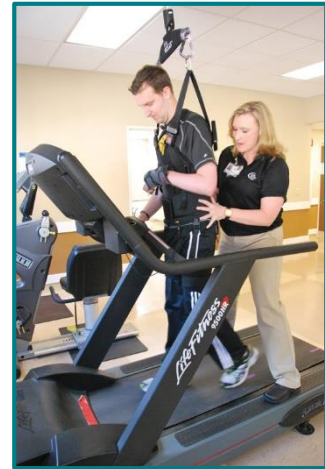
Concurrent SCI and TBI

- Frequency
 - Concurrent TBI in patients with primary tSCI range from 12% to 74% (NIH, 2022)
 - Inpatient SCI rehab study
 - 58.5% had TBIs
 - 45% of TBI diagnoses missed in acute hospitalization
- Causes
 - Motor vehicle crashes
 - Falls



How does the TBI get missed?

- Mild TBI most likely to be missed
 - Contusions missed in up to 67% of cases (Sikka et al, 2019; Kushner, 2015)
- Focus turns to the many acute concerns in SCI
 - Once assigned to SCI team, TBI possibility less likely to be considered
- ACRM criteria for TBI
 - Any loss of consciousness
 - Post-traumatic amnesia
 - Alteration of mental status
 - Focal neurologic finding



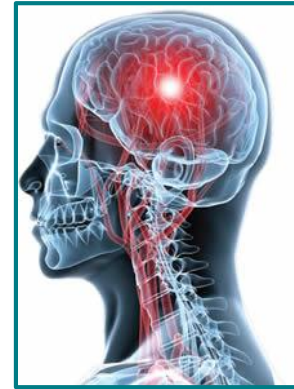
What happens when a TBI is missed?

- Higher care burden (Pinto et al., 2016)
 - SCI + TBI have increased LOS, caregiver burden
 - Higher numbers of nursing hours required
 - Higher costs in inpatient rehabilitation
- Less likely to qualify for 3-hour rule for acute rehab
 - Delayed rehab admission associated with poorer outcome
- More likely to have aggressive, emotional outbursts
- FIM scores lower with TBI
- Lower rates of employment
- Poorer quality of life



Post-Concussive Syndrome (PCS)

- Constellation of physical, cognitive, behavioral, emotional symptoms after TBI
- The vast majority of mTBI cases result in complete resolution within a few weeks
 - Persistent post-concussive syndrome occurs in an estimated 15% of mTBI cases
 - May be underestimated due to limited diagnostic tools



Risk Factors: Persistent PCS

- Females
- Double impact
- + LOC
- Early high symptom burden
- Early major visual symptoms
- Lack of early education on mTBI
- Delayed rehab
- Litigation status
- Concurrent anxiety, depression
- Comorbid neck injury
- Prior concussion history
- History of chronic pain syndrome
- History of attentional deficit hyperactivity disorder (ADHD)
- History of learning disability
- History of seizure disorder, migraines
- Psychiatric history

But...Not everything is TBI!

It can be easy to assume (especially in neuro rehab) that a patient with cognitive impairment or behavioral dyscontrol has a TBI.

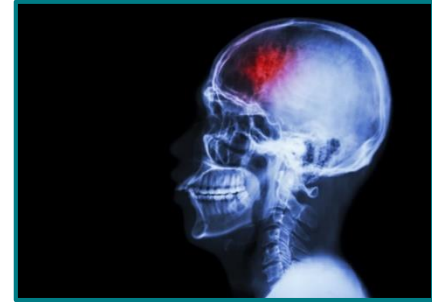


Factors that may mimic TBI symptoms

- ICU delirium
- ICU psychosis
- Infection
- Pain
- Hypoxia
- Pain
- Chronic illnesses
- Sleep disorders
- Pre-existing cognitive deficits
- Developmental disorders
- Depression
- Anxiety
- Acute/post-traumatic stress

What actually happens in neurotrauma?

- Primary injury
 - Immediate physical damage to structure of CNS
 - Direct impact, compression, or penetration
- Secondary injury
 - Continued cellular damage from impaired cellular, metabolic processes
- Elevated inflammatory state
 - Elevated inflammation after SCI can affect brain functioning even without direct TBI (Wu et al, 2014)



Cognitive Effects of Medications

- **Anti-epileptics**
 - Often used for seizure and headache prophylaxis
 - Slowed processing speed, executive dysfunction
 - Topamax: language
 - Lyrica: divided attention
- **Anti-cholinergic medications**
 - Used for bladder instability, spasticity, nausea, vertigo
 - Acute: Significant effects on processing speed, delirium risk
 - Chronic use: gross cognition
- **Narcotics**
 - Pain medications
 - Acute use: Deficits of processing speed, attention, memory retrieval,
 - Chronic use: Executive dysfunction
- **Benzodiazepines**
 - Used for anxiety, sleep, spasticity
 - Impairment of new learning, faster forgetting, processing speed, motor speed
 - Long term use increases dementia risk

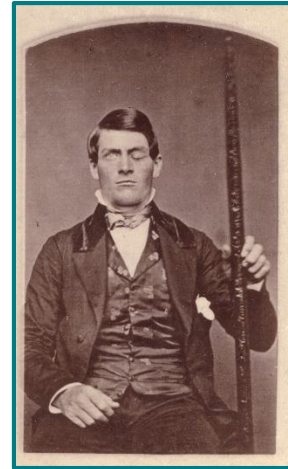
Effects of Cognitive Lifestyle

- The brain tries to be efficient with its resources
 - Unused neuronal connections pruned
 - Used neuronal connections strengthened
- Cognitive lifestyle
 - Education
 - Occupational complexity
 - Cognitive challenge
 - Social engagement
- Effects
 - Overall cognitive decline
 - Memory, executive function
 - Onset of cognitive decline
 - Impact of neurodegenerative process in the brain



What is a Neuropsychologist?

- Clinical Psychologist
- Ph.D. or Psy.D.
 - Internship
 - Licensure
- Post-doctoral fellowship training in neuropsychology
 - Advanced understanding of brain-behavior relationships as related to disorders of the CNS, their effects of cognitive and behavioral functioning
 - Assessment, diagnosis, treatment of disorders of the brain and their effects on cognition, behavior, mood



Roles of Neuropsychologists

- Determine what functions of the brain have been disrupted
 - To what extent
 - Diagnosis of disorders of the brain
 - Differentiate from normal human variability, aging, developmental, learning disorders
- Identify what changes mean in the person's day-to-day life
- Make predictions about ability to return to independence
- Recommendations for treatment
- Education for patients, families



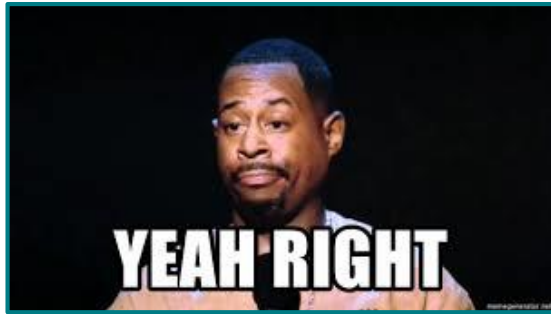
Indications for Evaluation

- *Whenever there is doubt about cognitive functioning*
- Normal aging vs dementia
- New injury/illness vs. premorbid level
- Neurological vs psychological.
- Baseline cognitive functioning prior to surgery
- Detecting subtle changes in patients with chronic medical or neurological disorders
 - Early detection of cognitive changes → earlier intervention
- Questions of decision-making capacity
- Questions of safety related to cognition and behavior



Myths about Neurocognitive Diagnosis

- Patients and family members can tell us what is going on with the patient's cognition



- Subjective
- Often does not align with objective data
- Insidious changes often not recognized
- Often falsely attributed to normal aging, stress, medication, not caring
- May be motivated by external incentives

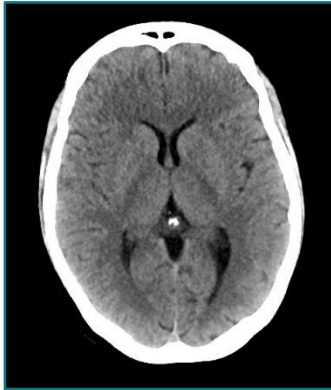
Myths about Neurocognitive Diagnosis

- Quick cognitive screening tests tell us the same things
 - MMSE, MoCA, SLUMS
- Goal of most other screening tests is to over-incorporate possible cases
 - False positives ruled out with further testing
- But cognitive screening tests have very high false negative rates instead
 - Poor sensitivity and specificity
 - Do not take into account variables impacting interpretation
 - Not normatively based
- Designed to detect dementia
- Fail at early detection
- Fail to capture higher-level deficits



Myths about Neurocognitive Diagnosis

- Imaging tells us what we need to know



- Structure $\neq$ function
- Recognition of deficits when no abnormalities can be visualized
- Only way to identify functional implications of brain pathology
- Structural findings often not helpful in differential diagnosis of neurocognitive dysfunction
- Cognition may be normal with abnormal structural findings

Neuropsychological Evaluation

- Test scores never exist in a vacuum
- Clinical interview
 - History of injury, illness, symptom development
 - Subjective concerns (with collateral)
 - Medical, psychiatric, substance, social, educational, occupational, legal history
- Medical record review
 - Initial injury data
 - Brain imaging
 - Lab values
 - History of symptom reporting
- Behavioral observation
- Neuropsychological test data
 - Length/scope of testing determined by phase of injury/illness
 - Earlier referral allows for re-testing to better predict outcomes



Neuropsychological Evaluation

- Premorbid ability
- Orientation
- Processing speed
- Attention
 - Simple, divided, sustained
- Language functions
 - Expressive, receptive
- Visuospatial functions
 - Visuoperception, construction, spatial ability
- Learning and memory
 - Rote vs. contextualized
 - Verbal vs. nonverbal
 - Recall vs. recognition
- Executive functions
 - Set-shifting
 - Problem-solving
 - Inhibition
 - Reasoning
 - Planning

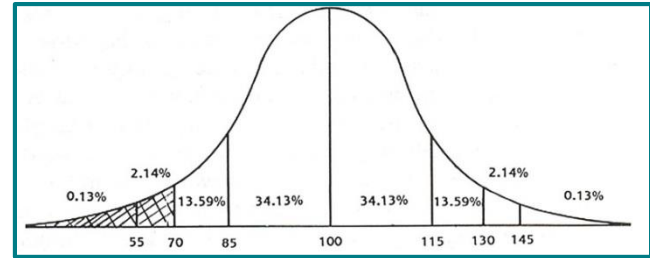
Neuropsychological Evaluation

- Motor abilities
 - Graphomotor speed
 - Fine motor dexterity, grip strength
- Behavioral modulation
 - Frustration tolerance
 - Social awareness
 - Impulsivity
 - Self monitoring
- Psychological functioning
 - Anxiety, depression
 - Suicide risk
 - Personality features



How are tests interpreted?

- Vs. estimated premorbid intelligence
 - Via education, occupation, algorithm based on parents' history
 - Standardized estimate tests, correlated abilities
- Normative comparisons
 - All tests stratified by age
 - Some stratified by gender, ethnicity, education
- Comparison to prior performance, if available
- Overall pattern compared with known syndrome patterns



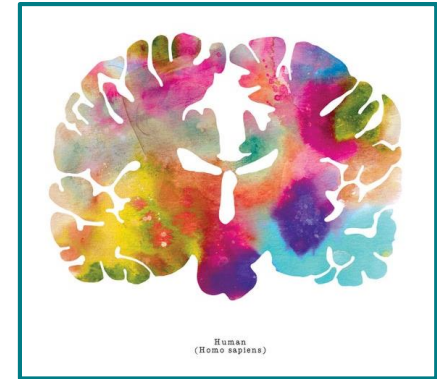
Performance Validity

- Crux of neuropsychological assessment hinges on whether or not the results are an accurate representation of what the test-taker is able to do (best ability)
- If not valid, results are worthless: minimal level of ability only
- Practice guidelines indicate measures of performance validity should always be included
- Assessed with dedicated tests, embedded tests, patterns of performance, in context of daily functioning



What does invalid performance mean?

- Is the examinee is performing to best of their cognitive ability?
 - Does not directly assess etiology for invalid performance
- PVT failure $\neq$ dx of malingering
- Presence of secondary gain $\neq$ dx of malingering
- Underlying assumption of PVTs
 - Test performance not only reflects brain functioning but many other intervening variables
- Must be interpreted in context of cultural background



Feigned Cognitive Impairment

- Rates vary depending on presumptive diagnosis, legal context
- $\approx 8\%$ in purely medical cases (Mittenberg et al, 2002)
- Base rate of symptom exaggeration 40% in compensation-seeking mTBI cases (Larrabee, 2007)
- 40% of patients claiming disability due to chronic pain likely invalid (Gervais et al., 2001)
- Probable symptom exaggeration in context of personal injury litigation, worker's compensation, disability claims reported in 25-30% (Green et al, 2001; Lees-Haley, 1997)
- Invalid vs. exaggeration vs. cry for help vs. malingering



Thank you, Case Managers!



Elizabeth Preston Cisneros, Ph.D.

Email: ecisneros@casacolina.org

Phone: (909) 596-7733 x3525

Fax: (909) 593-0096

Visit www.casacolina.org to learn more.

Thank You for Attending!

Please feel free to engage with those in attendance, ask and answer questions, and let us know if you need anything.

