Role of Neuropsychology

Concussion Management

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Disclosures

• I have no disclosures
Objectives

• Understand the differences between Neurocognitive test and a Neuropsychological assessment
• Explain various roles Neuropsychologists play in concussion management
• Identify factors to consider with baseline and post-injury testing
• Know when to refer to a neuropsychologist or clinical sports neuropsychologist
History: Baseline & Post-Injury Assessment Model

• SLAM: Sports as a Laboratory Assessment Model (Barth et al, 1980s)
  – Division I Collegiate athletes
  – Brief paper & pencil neuropsychological battery
  – Baseline & Post-injury days: 1, 5, 10, & 12
    • Initial cognitive deficits and symptoms that resolved over 10 days

• Professional teams followed

Bailey, et al., 2009, *Journal of Head Trauma Reh*
Baseline & Post-Injury Assessment

• 1990s: development of Computerized Neurocognitive Tests (CNTs)
• Rapidly grew in popularity and became widely utilized
• 68.5% of secondary school ATCs in a 2014 survey were using CNTs
• Used by most professional teams/leagues
  • NHL uses CNT & brief paper & pencil ("hybrid" approach)
• Note: CNTs don’t diagnosis concussion
Traditional vs Computerized Neuropsychological Assessment

**Paper & Pencil**
- Time and labor intensive; expensive
- Specialized training for administration
- Personal interaction & effort monitoring
- Flexible & task/compliant specific
- Can assess auditory processing & performance

**Computerized**
- Efficient, cost effective & easy to administer
- Precise measurement of reaction time & speed
- May be more sensitive to acute concussion
- Multiple alternative forms
- Internal validity checks
- Often misused or interpreted by non-qualified individuals

Meehan, et al., 2012

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Neurocognitive ≠ Neuropsychological

**Neurocognitive Test**
- Tool designed to assess cognitive processes (e.g. attention, memory, processing speed, reaction time)
- Standardized administration, established normative data, known reliability, sensitivity, and specificity
- Examples: SAC, Trail Making Test, ImPACT

**Neuropsychological Assessment**
- Integration and interpretation of cognitive and psychological test performance with information regarding the individuals background and developmental and medical history, current status (e.g., medications, sleep, emotions, motivation, effort), etc.
Right Tools for the Right Time

Sideline
- SCAT-5
- King Devick Test (KD)
- Mules

Acute
- CNT
- Brief Paper & Pencil
- Symptom Scales
- KD/SCAT-5

Prolonged
- Traditional NP Assessment
- Psychological Tests
- Performance Validity

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Assessment Strategies - Baseline

- Makes intuitive sense
- May be especially important for individual who are:
  - Above average
  - Below average
  - ADHD
  - Learning disabled (LD)
  - Ideal

- Quality of baseline matters!
- Most concussions can be appropriately managed

Baseline neuropsychological data should be reviewed for validity and interpreted by a trained individual (ideally a neuropsychologist)

- Learning disabled (LD)

Elbin, et al., 2013

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Assessment Strategies - Acute

• Common acute cognitive deficits
  – Processing Speed and reaction time
  – Attention
  – Memory
  – Executive functioning

• CNTs (ImPACT, CogState, ANAM, etc.)
• Brief Paper and Pencil (if appropriate)
• Symptom Inventory (if not embedded)
• Mood/Somatization Scales
“When computerized cognitive tests are used in the evaluation and management of SRC, neuropsychologists play an important role in all phases of test administration and interpretation, from education of sports medicine staff involved in testing, to ensuring that data are collected in a reliable and valid manner, to interpretation of obtained data.” (p.3)
Sports Neuropsychology

• “subspecialty of clinical neuropsychology that applies science and understanding of brain-behavior relationships to the assessment and treatment of sports related brain injury. The practice of sports neuropsychology requires education, training, experience, and competence in the primary field of clinical neuropsychology, followed by a secondary specialization through experience and understanding of applying clinical neuropsychology to the unique demands of evaluating and treating brain injury in the sports domain.”

-Sports Neuropsychology Society
In the acute stages, Neuropsychologists:

- Interpret baseline and post-injury CNTs
- Conduct brief, focused evaluations to assess for concussion related cognitive declines
- Assess for primary or secondary emotional or behavioral changes related to injury and intervene as appropriate
- Provide information about clinical trajectories and treatment
- Provide concussion education, set appropriate expectations for recovery
- Provide guidance for return to work or school
- Offer key information for making safe return to play decisions
Assessment Strategies - Prolonged

- Chronic (>3-6mos) or complicating factors
  - Full traditional neuropsychological assessment
  - Psychological functioning
  - Psychosocial factors and stressors
- PCSS, Self-report mood measures, etc.
- Details on course of recovery, activities, symptoms, behavior, etc.
- Concussion understanding and expectations
- Rehabilitation and management recommendations
- Help initiate 504 Plan or IEPs if needed
Referral to Neuropsychology

• Dependent on program or referral questions
• Persistent cognitive complaints beyond expected recovery period
• Concerns about additional cognitive, psychological or behavioral factors impacting recovery
Thank You!
References:


• Sports Neuropsychological Society. [www.sportsneuropsychologicalsociety.com](http://www.sportsneuropsychologicalsociety.com)