Neurological/Behavioral Health Subcommittee

Scientific Evidence of Using Population Normative Values for Post-Concussive Computerized Neurocognitive Assessments

Defense Health Board
August 20, 2015

Overview

- Membership
- Tasking
- Areas of Interest
- Timeline
- Way Ahead

Neurological/Behavioral Health Subcommittee Membership

- There are nine members of the Neurological/Behavioral Health Subcommittee.

Background

"The Military Services have raised concerns about the utility and logistics of continuing to collect pre-deployment baseline neurocognitive tests because emerging scientific evidence suggests that before and after comparative testing using baselines may be no more effective than using relevant population normative values for the detection of cognitive deficits associated with the concussion."

- Under Secretary of Defense (Personnel & Readiness) (USD(P&R)) Memo dated July 25, 2014

Request the Defense Health Board examine the state-of-science on neurocognitive assessment testing and consider the following questions:

1. Does the current state-of-the science demonstrate a continued need for baseline computerized neurocognitive tests to make return-to-duty/play determinations?

2. Is the current dataset of military relevant normative values of the ANAM4 (sample size 107,000) an adequately sized population to generate age, gender, education, and rank-matched military normative values, or should a larger dataset be implemented for the norms?

3. Are population normative values (assuming an adequate number and military-relevant demographic profile) as scientifically sound as pre-deployment baseline tests for reliably detecting post-concussive neurocognitive deficits (within the limitation of ANAM4) for return-to-duty decision making and prognosis?

4. Is there any utility to expanding the use of neurocognitive assessment testing of military populations beyond the deployment cycle (pre-deployment, post-injury, post-deployment)?

5. Is any additional direction for future research in neurocognitive assessment testing needed to improve protection of the fighting force?

6. What is the cost benefit of performing baseline testing for the Military Services in a fiscally constrained environment when logistics, contracts, personnel, and equipment sustainment are taken into consideration?

- USD(P&R) Memo dated July 25, 2014

- ANAM post-injury evaluations
  - Ideally, an accurate baseline is the best comparison test
  - Clinicians who have used baselines to evaluate mTBI recovery indicate there is value in having them
  - Some studies indicate a well designed normative database is as effective as baseline comparison (on a population level)
  - A normative database is not optimal to assess mTBI in those with cognitive functioning significantly above/below average

- Issues with Neurocognitive Assessment Tools (NCATs)
  - Impact of confounding factors (fatigue, effort, comorbidities)
  - Test/Re-test reliability

- Current ANAM normative dataset
  - 107,000 baselines, stratified only by age and sex

- Future ANAM normative dataset
  - Data repository of 1.8 million tests converted into a searchable database
  - Creation of expanded normative dataset with increased stratification in progress → should improve accuracy

- Costs/Benefits associated with ANAM use
  - Cost of baseline testing vs maintaining normative dataset
  - Impact on decision making
    - Diagnosis, treatment, prognosis, recovery, return-to-duty

- Future research on NCATs
  - DoD ANAM data provides unique research opportunities
    - Post-injury data: refine and assess performance of expanded normative dataset
  - Test interpretation methodology
  - Psychometric implications of test device/environment
  - Optimizing/validating baselines, normative datasets, test components
  - Areas of cognitive function most affected by mTBI
  - Cost effectiveness of ANAM vs IMPACT vs other NCATs?

Meetings since May 12 Board meeting:

- May 26, 2015– Teleconference
  - Discussed the tasking with Dr. Allison Cernich and Dr. Michael McCrea
- July 9, 2015 – Teleconference
  - Discussed the tasking and reviewed draft report
- July 23, 2015 – Teleconference
  - Discussed the tasking and reviewed draft report

Way Ahead

- Continue to develop draft report, findings, and recommendations

- Continue monthly teleconferences or meetings

- Meet with additional subject matter experts, as needed

- Present report for public deliberation at November Board meeting

Questions?