



Neurological/Behavioral Health Subcommittee

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

**Defense Health Board
May 12, 2015**



Overview

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



Neurological/Behavioral Health Subcommittee Membership

- Comprised of nine members



Tasking

(1 of 4)

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



Tasking

(2 of 4)

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?



Tasking

(3 of 4)

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)?



Tasking

(4 of 4)

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



Areas of Interest

(1 of 3)

- ANAM post-injury evaluations
 - Ideally, an accurate baseline is the best comparison test
 - However, evidence is conflicting or inadequate in showing superiority of baseline versus normative data
 - Baseline of most value for upper/lower tails of Bell curve
 - Clinicians who have used baselines to evaluate mTBI recovery indicate there is value in having them
- Issues with NCATs in general
 - Impact of confounding factors (e.g., fatigue, comorbidities)
 - Test/Re-test reliability



Areas of Interest

(2 of 3)

- Current ANAM normative dataset
 - Stratified by age and gender
 - Opportunities to improve
 - Large data repository → larger normative dataset
 - Increased stratification

- Costs/Benefits associated with ANAM use
 - How is effectiveness of program being measured?
 - Impact on decision making?
 - Diagnosis, treatment, prognosis, recovery, return to duty?
 - Have adequate data been captured to assess benefits?



Areas of Interest

(3 of 3)

- Research on neurocognitive assessment tools (NCATs)
 - Lessons from athletic programs
 - Improvements in test interpretation methodology
 - Psychometric implications of test device/environment
 - ANAM subtest combination of most value
 - Analysis of DoD data repository in progress
 - Other publications assessing ANAM pending
- Additional research is needed



Timeline

Meetings since February 11 Board meeting:

- February 17, 2015 – Teleconference
 - Discussed the tasking with representatives from the Defense and Veterans Brain Injury Center and Walter Reed National Military Medical Center
- March 11, 2015 – Meeting
 - Met in-person to discuss tasking with selected subject matter experts in the ANAM and computerized neurocognitive testing from the Navy, Army, and United States Naval Academy
- April 27, 2015 – Teleconference
 - Discussed the tasking and issues in computerized neurocognitive testing with subject matter experts from Harvard University and St. Joseph's Medical Center



Way Ahead

- Continue literature review
- Meet with additional subject matter experts
- Continue monthly teleconferences or meetings
- Information gathering through mid-2015
- Draft report beginning March 2015



Questions?