



Indications and Conditions for In-Theater Post-Injury Neurocognitive Assessment Tool (NCAT) Testing

INTRODUCTION AND BACKGROUND

In accordance with Section 1673 of the National Defense Authorization Act HR 4986, signed into law in January 2008, the Secretary of Defense was instructed to establish a protocol for the pre-deployment assessment and documentation of the cognitive functioning of service members deployed outside the United States. In advance of definitive evidence of superiority for any single neuro-cognitive assessment tool (NCAT), the Automated Neuropsychological Assessment Metrics (ANAM) was chosen by a Department of Defense expert consensus panel as an interim instrument with which to implement this program pending further evaluation of computerized neurocognitive assessment tools. The department successfully implemented a pre-deployment NCAT program utilizing the ANAM. According to the Defense and Veterans Brain Injury Center (DVBIC), pre-deployment cognitive baseline results are obtained for deploying service members.

Baseline or pre-deployment ANAM testing, mandated within 12 months of deployment, provides a reference point for neurocognitive testing following traumatic brain injury (TBI). To support the practical use of ANAM as an assessment tool for service members who sustain a concussion, the Army Neurocognitive Assessment Branch Office distributed ANAM-capable laptops for use by theater providers. Additionally, the Defense Health Information Management System has been working closely with the DVBIC NCAT office and the services' points of contact to create a web accessible system that can be incorporated into the Army MC4 laptop issued to deploying providers. This would enhance theater ANAM testing and facilitate more rapid access to pre-deployment baseline studies to assist in the clinical neurocognitive assessment of the injured service member.

There is general consensus that a subset of service members diagnosed with concussion (also known as mild TBI) may benefit from post-injury NCAT testing. Clarification of the indications for post-injury neurocognitive testing, optimal conditions for testing, and identification of the appropriate individual to administer and interpret the test has been requested by theater providers.

The following clinical recommendations are intended to offer guidance to providers regarding the effective use of NCAT testing following a TBI. These recommendations are based on the proceedings of a December 2010 expert panel convened by DVBIC that included clinical subject matter experts representing all four military services and the Department of Veterans Affairs. The clinical recommendations were reviewed and approved by the Defense Department's TBI Quad Service Cell, which includes TBI representatives from the Army, Navy, Marine Corps and Air Force.

CLINICAL RECOMMENDATIONS

- Post injury assessment with ANAM should be considered one component of a comprehensive evaluation and return to duty (RTD) assessment when a concussion is accompanied by symptoms lasting longer than 24 hours, post-traumatic amnesia (PTA) of any duration, or a loss of consciousness. The test can be repeated serially following post-injury symptom resolution to document neurocognitive recovery to pre-deployment ANAM levels and to further inform the RTD assessment.
- Post-injury NCAT testing should only be used as one component of a thorough clinical evaluation by a qualified provider. It should not be used in isolation for clinical decision making as it was not designed for the diagnosis of concussion. Ideally, a psychologist would be available for cognitive evaluations, including evaluation with ANAM.
- ANAM should only be administered in a quiet, comfortable setting without any distractions. The service member should be well rested prior to ANAM testing and other medical conditions should be adequately addressed so as to not interfere with the testing procedure. For example, testing should be avoided when the service member



is experiencing a severe headache, anxiety, sleep deprivation, or is reporting or exhibiting side effects of their current medications.

- Service members with a mild concussion, no loss of consciousness LOC, and rapidly resolving (within 1-2 hours) symptoms do not routinely benefit from NCAT as part of a RTD assessment. Clinicians should use best clinical judgment based on the status of the concussed service member in conjunction with an assessment of the operational environment in determining the need and practicality of referring them for an NCAT.
- When a post-injury NCAT is considered appropriate, the initial study should be administered between 24-72 hours after injury whenever possible.
- For service members who remain symptomatic, serial NCAT testing (every 3-4 days) can be used to monitor cognitive recovery from a concussion. It should be noted that cognitive recovery alone should not be the sole basis of RTD decision making.
- A provider to psychologist/neuropsychologist tele-consultation can be used to help interpret the post-injury NCAT test scores, assuming a qualified provider or technician administered the NCAT.

CONCLUSION:

NCAT is a useful and effective tool for the assessment of service members following the diagnosis of concussion. ANAM has been selected as the current NCAT test of choice for the DoD pre-deployment NCAT program and ANAM capabilities are available for use in the deployed setting. NCAT is best utilized as one component of a comprehensive assessment for the service member with clinically confirmed concussion. It should not be used as a screening or diagnostic tool for the exposed service member prior to an actual diagnosis of concussion. When used properly, the NCAT can provide valuable clinical insight, particularly regarding neurocognitive deficits. It is a tool to consider when presented with a service member who sustained a concussion and has persistent symptoms if it can be administered within the appropriate time frame and under acceptable conditions.

As with all clinical decisions, field and operational circumstances may at times require divergence from these recommendations.

REFERENCES:

- Bleiberg J, Cernich AN, Cameron K, et al. Duration of cognitive impairment after sports concussion. *Neurosurgery* 2004;54:1073–1078.
- Friedl KL, Gate SJ, Proctor SP, et al. Army research needs for research automated neuropsychological tests: Monitoring soldier health and performance status. *Archives of Clinical Neuropsychology* 2007;22S:S7–S14.
- Leuthcke CA, Bryan CJ, Morrow CE, Isler WC. Comparison of concussive symptoms, cognitive performance, and psychological symptoms between acute blast-versus, nonblast-induced mild traumatic brain injury. *Journal of International Neuropsychological Society* 2011;17(1):36-45.
- Reeves DL, Winter KP, Bleiberg J, Kane RL. ANAM genogram: Historical perspectives, description, and current endeavors. *Arch Clin Neuropsychol* 2007;22S:S15–S37.
- Vincent AS, Bleiberg J, Yan S, et al. Reference data from the ANAM for use in TBI in an active duty military sample. *Military Medicine* 2008;173(9):836–852.
- Warden DL, Bleiberg J, Cameron KL, et al. Persistent prolongation of simple reaction time in sports concussion. *Neurology* 2001;57:524–526.

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