



PERSONNEL AND  
READINESS

**UNDER SECRETARY OF DEFENSE**  
4000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-4000

MAR 26 2015

The Honorable Thad Cochran  
Chairman  
Committee on Appropriations  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

The enclosed report is in response to House Report 111-491, page 314, to accompany H.R. 5136, the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2011 and section 1673 of the NDAA for FY 2008 (Public Law 110-181). Due to the similarities of these requirements, the Department of Defense (DoD) has worked to combine the efforts to fulfill the requirements into a comprehensive response.

House Report 111-491 requested the Secretary of Defense to conduct a comparison study on the effectiveness and reliability of various computerized test batteries when used as pre- and post-deployment assessment tools for neurocognitive functioning. The purpose of the study was to obtain evidence-based outcomes of the assessment tools to aid in the detection of brain injuries when a Service member returns from deployment. The DoD compared four different computerized neurocognitive assessment tools (i.e., Automated Neuropsychological Assessment Metrics, ImPACT, CogState Sport, and CNS Vital Signs) in two separate clinical trials.

The first comparison study, mentioned in a previous interim report to Congress on May 30, 2013, focused on the test-retest reliability of the assessment tools. The primary finding was that there is no clear evidence supporting one of the computerized tools over the others. The second study examined the validity of each of the four tests and found no difference from traditional (i.e., pencil and paper) neuropsychological tests in detecting cognitive impairment following a concussion. The Department will continue to monitor the evolution of neurocognitive assessment testing platforms and re-assess the science in conjunction with external scientific advisors and internal subject matter experts.

Thank you for your interest in the health and well-being of our Service members, veterans, and their families. A similar letter is being sent to the other congressional defense committees.

Sincerely,



Jessica L. Wright

Enclosure:  
As stated

cc:  
The Honorable Barbara A. Mikulski  
Vice Chairwoman



PERSONNEL AND  
READINESS

UNDER SECRETARY OF DEFENSE  
4000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-4000

MAR 26 2015

The Honorable John McCain  
Chairman  
Committee on Armed Services  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

The enclosed report is in response to House Report 111-491, page 314, to accompany H.R. 5136, the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2011 and section 1673 of the NDAA for FY 2008 (Public Law 110-181). Due to the similarities of these requirements, the Department of Defense (DoD) has worked to combine the efforts to fulfill the requirements into a comprehensive response.

House Report 111-491 requested the Secretary of Defense to conduct a comparison study on the effectiveness and reliability of various computerized test batteries when used as pre- and post-deployment assessment tools for neurocognitive functioning. The purpose of the study was to obtain evidence-based outcomes of the assessment tools to aid in the detection of brain injuries when a Service member returns from deployment. The DoD compared four different computerized neurocognitive assessment tools (i.e., Automated Neuropsychological Assessment Metrics, ImPACT, CogState Sport, and CNS Vital Signs) in two separate clinical trials.

The first comparison study, mentioned in a previous interim report to Congress on May 30, 2013, focused on the test-retest reliability of the assessment tools. The primary finding was that there is no clear evidence supporting one of the computerized tools over the others. The second study examined the validity of each of the four tests and found no difference from traditional (i.e., pencil and paper) neuropsychological tests in detecting cognitive impairment following a concussion. The Department will continue to monitor the evolution of neurocognitive assessment testing platforms and re-assess the science in conjunction with external scientific advisors and internal subject matter experts.

Thank you for your interest in the health and well-being of our Service members, veterans, and their families. A similar letter is being sent to the other congressional defense committees.

Sincerely,



Jessica L. Wright

Enclosure:  
As stated

cc:  
The Honorable Jack Reed  
Ranking Member





PERSONNEL AND  
READINESS

UNDER SECRETARY OF DEFENSE  
4000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-4000

MAR 26 2015

The Honorable William M. "Mac" Thornberry  
Chairman  
Committee on Armed Services  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

The enclosed report is in response to House Report 111-491, page 314, to accompany H.R. 5136, the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2011 and section 1673 of the NDAA for FY 2008 (Public Law 110-181). Due to the similarities of these requirements, the Department of Defense (DoD) has worked to combine the efforts to fulfill the requirements into a comprehensive response.

House Report 111-491 requested the Secretary of Defense to conduct a comparison study on the effectiveness and reliability of various computerized test batteries when used as pre- and post-deployment assessment tools for neurocognitive functioning. The purpose of the study was to obtain evidence-based outcomes of the assessment tools to aid in the detection of brain injuries when a Service member returns from deployment. The DoD compared four different computerized neurocognitive assessment tools (i.e., Automated Neuropsychological Assessment Metrics, ImPACT, CogState Sport, and CNS Vital Signs) in two separate clinical trials.

The first comparison study, mentioned in a previous interim report to Congress on May 30, 2013, focused on the test-retest reliability of the assessment tools. The primary finding was that there is no clear evidence supporting one of the computerized tools over the others. The second study examined the validity of each of the four tests and found no difference from traditional (i.e., pencil and paper) neuropsychological tests in detecting cognitive impairment following a concussion. The Department will continue to monitor the evolution of neurocognitive assessment testing platforms and re-assess the science in conjunction with external scientific advisors and internal subject matter experts.

Thank you for your interest in the health and well-being of our Service members, veterans, and their families. A similar letter is being sent to the other congressional defense committees.

Sincerely,



Jessica L. Wright

Enclosure:  
As stated

cc:  
The Honorable Adam Smith  
Ranking Member



PERSONNEL AND  
READINESS

UNDER SECRETARY OF DEFENSE  
4000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-4000

MAR 26 2015

The Honorable Harold Rogers  
Chairman  
Committee on Appropriations  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

The enclosed report is in response to House Report 111-491, page 314, to accompany H.R. 5136, the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2011 and section 1673 of the NDAA for FY 2008 (Public Law 110-181). Due to the similarities of these requirements, the Department of Defense (DoD) has worked to combine the efforts to fulfill the requirements into a comprehensive response.

House Report 111-491 requested the Secretary of Defense to conduct a comparison study on the effectiveness and reliability of various computerized test batteries when used as pre- and post-deployment assessment tools for neurocognitive functioning. The purpose of the study was to obtain evidence-based outcomes of the assessment tools to aid in the detection of brain injuries when a Service member returns from deployment. The DoD compared four different computerized neurocognitive assessment tools (i.e., Automated Neuropsychological Assessment Metrics, ImPACT, CogState Sport, and CNS Vital Signs) in two separate clinical trials.

The first comparison study, mentioned in a previous interim report to Congress on May 30, 2013, focused on the test-retest reliability of the assessment tools. The primary finding was that there is no clear evidence supporting one of the computerized tools over the others. The second study examined the validity of each of the four tests and found no difference from traditional (i.e., pencil and paper) neuropsychological tests in detecting cognitive impairment following a concussion. The Department will continue to monitor the evolution of neurocognitive assessment testing platforms and re-assess the science in conjunction with external scientific advisors and internal subject matter experts.

Thank you for your interest in the health and well-being of our Service members, veterans, and their families. A similar letter is being sent to the other congressional defense committees.

Sincerely,



Jessica L. Wright

Enclosure:  
As stated

cc:  
The Honorable Nita M. Lowey  
Ranking Member



# **REPORT TO CONGRESS**

**National Defense Authorization Act (NDAA) for  
Fiscal Year (FY) 2008, Section 1673;  
House Report (H.R.) 111-491, Accompanying H.R.  
5136, the NDAA for FY 2011, Page 314, Improvement  
of Medical Tracking System for Members of the  
Armed Forces Deployed Overseas**



**February 2015**

The estimated cost of this report or study for the Department of Defense is approximately \$7,240 in Fiscal Years 2008 - 2015. This includes \$0 in expenses and \$7,240 in DoD labor.  
Generated on 2015Jan15 RefID: 6-AC99608

## **Introduction**

There have been several statutory provisions directing the Secretary of Defense to ensure cognitive assessments of the Armed Forces (sections 1618 and 1673 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2008, P.L. 110-181; section 722 of the NDAA for FY 2011, P.L. 111-383). Additionally, House Report 111-491 requested the Secretary of Defense to conduct a comparison study on the effectiveness and reliability of various computerized tests for pre- and post-deployment assessment of neurocognitive functioning. The previous four interim reports updated Congress on Department of Defense (DoD) efforts to comply with these legislative requirements, and they responded to all of the legislative requirements except for the effectiveness (i.e., validity) part of the comparison study requested in House Report 111-491. This fifth and final report will briefly summarize those actions that respond to the statutory requirements and then move on to describe the results of the recently completed validity study of computerized neurocognitive tests, concluding the DoD response to all of these legislative requirements.

## **Discussion**

Section 1618 of the FY 2008 NDAA calls for an evidence-based means of assessing Traumatic Brain Injury (TBI), Posttraumatic Stress Disorder, and other mental health conditions, as well as a system of pre- and post-deployment screenings of cognitive ability in Service members to detect cognitive impairment. Section 1673 of the FY 2008 NDAA mandates pre-deployment assessment and documentation of the cognitive functioning (including memory) of deployed Service members, a directive that was reiterated in section 722 of the FY 2011 NDAA.

In 2008, the Assistant Secretary of Defense for Health Affairs issued a memorandum directing the use of the Automated Neuropsychological Assessment Metrics (ANAM) to fulfill the requirement for pre-deployment cognitive testing and calling on the Services to begin implementing baseline pre-deployment neurocognitive assessments for deploying Service members. The implementation of this policy is facilitated by the Army Neurocognitive Assessment Branch, which provides and maintains computer hardware, ANAM software, training for each of the Services, and over 30 pre-deployment training sites.

The 2008 memorandum was incorporated in the DoD Instruction (DoDI) 6490.13, "Comprehensive Policy on Neurocognitive Assessments by the Military Services," June 4, 2013, requiring the implementation of a comprehensive neurocognitive assessment policy in the Services. The DoDI expanded the scope of the 2008 memorandum by outlining the processes for post-injury and post-deployment neurocognitive testing in the DoD. A key element of DoDI 6490.13 was that automated neurocognitive assessment tools be used in a screening capacity to detect cognitive changes as part of a clinical evaluation rather than as a stand-alone diagnostic



tool. This key standard was further disseminated in the Defense Centers of Excellence Clinical Recommendation, “Indications and Conditions for In-Theater Post Injury Neurocognitive Assessment Testing.” The DoDI established the protocols for neurocognitive assessment testing as mandated by the legislation.

House Report 111-491 requested the Secretary of Defense to conduct a comparison study on the reliability and effectiveness (i.e., validity) of various computerized neurocognitive test batteries in order to identify which, if any, are most reliable and valid (House Report 111-491, Title VII, “Health Care Provisions”). Two separate clinical trials were conducted at Fort Bragg, North Carolina. The first of these studies, “The Comparative Cognitive Test Study,” evaluated the reliability of four different computerized tools: Automated Neuropsychological Assessment Metrics (ANAM 4™), Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT®), CogState Sport™, and CNS Vital Signs. The reliability of the computerized neurocognitive assessment tools (NCATs) was determined by examining how well each of the four tests provided the same results in healthy individuals when tested at two different times (i.e., test-retest reliability). As summarized in the previous September 4, 2014, interim report to Congress and published in the July 2013 issue of the Archives of Clinical Neuropsychology, this trial did not provide clear evidence supporting one computerized NCAT over the others, and all four had generally equivalent reliability.

New data from the recently completed study about the validity of the four computerized NCATs are now available, and the report of these data concludes the DoD response to all of the NCAT-related legislative provisions. This recently completed study assessed the validity of the same four computerized NCATs, ImPACT®, CogState Sport™, ANAM 4™, and CNS Vital Signs, by determining the ability of the computerized NCATs to detect cognitive impairment in Service members with and without acute mild TBI as measured by the traditional (i.e., pencil and paper) neuropsychological testing method. The initial statistical analyses demonstrated that NCATs are generally equivalent to pencil-and-paper tests. All NCATs were equivalent to traditional pencil-and-paper tests in their ability to detect cognitive deficits associated with concussion. Additionally, when compared with traditional pencil-and-paper tests, all four computerized NCATs were found to be valid and effective tests for detecting post-traumatic cognitive deficits. However, all of these neurocognitive tests require supplementary testing and clinician involvement when used to assess individual patients.

## **Conclusion**

The comprehensive neurocognitive assessment policy currently in place addresses the legislative provisions for the cognitive testing of the Armed Forces. The final results of the NCAT comparison studies provide evidence that none of the four computerized NCATs studied was clearly superior from a reliability or validity standpoint. All four computerized NCATs performed with similar reliability and validity. The DoD will continue with the pre-deployment testing program, which includes baseline testing, as prescribed in DoDI 6490.13. The

Department will continue to monitor the evolution of neurocognitive assessment testing platforms and re-assess the science to include exploring the use of normative databases for comparisons in conjunction with internal and external stakeholders.

The field of TBI, and particularly concussion, is rapidly evolving. The DoD is committed to closely monitoring new research findings and updating clinical guidelines and recommendations for the care of Service members with TBI to ensure the highest quality, evidence-based TBI prevention, diagnosis, treatment, and long-term follow-up care.