DoD Warfighter Brain Health Initiative

Defense Health Board: 30 November 2022

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Warfighter Brain Health: Definition

- Warfighter brain health is defined as the physical, psychological, and cognitive status that affects a warfighter's capacity to function adaptively in any environment and impacts readiness, operational capability, mission effectiveness, and the goal to achieve overmatch or superior lethality. [Source: Deputy Secretary of Defense Memorandum, "Comprehensive Strategy and Action Plan for Warfighter Brain Health," dated October 1, 2018 and National Defense Strategy, January 2018]

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DoD Warfighter Brain Health Initiative (WBHI): Authority and Scope

On 1 October 2018, the Deputy Secretary of Defense provided direction for a Comprehensive Strategy and Action Plan for Warfighter Brain Health

- Develop Department-wide strategy to address:
  - Brain Health to include Cognitive and Physical Performance
  - Brain Exposures
  - Traumatic Brain Injury
  - Late and Long-Term Effects
- To synchronize and prioritize efforts into a single brain health approach to produce more efficient and effective results

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DoD WBHI: Purpose

- The Department's mission to defend the Nation hinges on a warfighters' ability to make expedient and effective decisions on the battlefield
  - To perform at the highest level, cognitive and physical capabilities must be optimized by addressing brain health, potentially hazardous brain exposures, traumatic brain injury (TBI), and long-term or late effects of TBI
  - Ensure warfighters are performing at optimized capacity and if exposed or injured by a known or emerging brain threat, return our warfighters to full health to include brain health
- To accomplish the above, the Warfighter Brain Health Initiative (WBHI) was established
- Prior to this initiative, there have been successful but disparate brain health efforts within the Department
- DoD senior leaders recognized the need to synchronize and prioritize efforts into a single brain health approach to produce more efficient and effective results

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DoD WBHI: Brain Health Priorities and Concerns

Disconnect Between Operational and Medical Communities	• There is perceived disconnect between the efforts of the operational (those preparing for combat) and medical communities on translating brain health information to the SM in time to help them.
The "Warrior Mindset"	• SMs have a desire to complete the mission despite brain exposures, injury or illness. SMs often compare themselves to other SMs who may be in a worse condition, therefore discrediting their own struggles or concerns.
Concerns for Diminished Training	• There were multiple concerns over the new emphasis on blast overpressure exposures and brain health and how safety and training changes may dilute their training opportunities. This may make it difficult to maintain deployment readiness and combat effectiveness.
Limited Information on Health Hazards, Adverse Effects, Protection Measures and Mitigation Strategies	• SMs want to know what brain exposures are most damaging to them and informed outright if they are at increased risk of exposure or injury while performing a specific training activity. They want brain exposures tracked, monitored and documented into a record that transfers and is visible to the veteran's hospital, should they require medical care after leaving active service.
Lack of Resources for Those Already Affected	• SMs want more resources (clinical tools, protocols, research solutions) for those who have been in the military for longer periods of time and may be noticing changes in their functional abilities.
Infrequent Periodic Health Scans/ Evaluations	• SMs would like to have general physical and brain health assessments, scans or tests occur on a more frequent and periodic basis across the career lifecycle along with aggressive follow-up if deficits are identified.

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DoD WBHI: Key Partnerships

Operational
- Close Combat Lethality Task Force
- Explosive Ordinance Disposal Community
- Resiliency and Suicide Prevention Office
- Senior Enlisted Advisor to the Chairman/ Joint Staff
- Section 734* Leads *(Blast Office, Army Public Health, Army Combat Capabilities Development)*
- Section 734 WG *(Service MR&A Reps)*
- USSOCOM

Safety
- DoD Laser Systems Safety Working Group
- Environmental, Safety and Occupational Health WG
- Hearing Conservation and Readiness WG
- Ionizing Radiation WG
- Occupational Medicine WG
- Office of the USD (Acquisition & Sustainment)
- Transmitted Electro-magnetic Radiation Protection WG

Outreach/ Training/ Education
- Council on Recruiting and Basic Training
- Force Education and Training Office
- Military Training Capabilities Group
- Office of the DASD (Military Community & Family Policy)
- Public Affairs Office
- TBI Center of Excellence (COE)

Clinical
- TBI Advisory Committee *(Service Reps, Joint Staff, Special Operation Forces, Reserve Component, US Coast Guard, US Army Medical Research & Development Command-USAMRDC, Uniformed Services University of the Health Sciences- USUHS, Defense Health Agency)*
- National Intrepid Center of Excellence (NICOE) and 10 Intrepid Sprits Centers
- TBI Clinics in Army, Navy, Air Force facilities

Research
- Academia
- Armed Services Biomedical Research Evaluation and Management Community of Interest
- Department of Veterans' Affairs
- Industry
- National Institutes of Health
- NICOE
- Office of Naval Research
- Office of the USD (Research & Engineering)
- TBI COE
- Tri Service Research Lab
- USAMRDC
- USUHS

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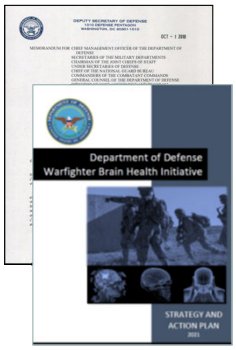
DoD WBHI: Drivers

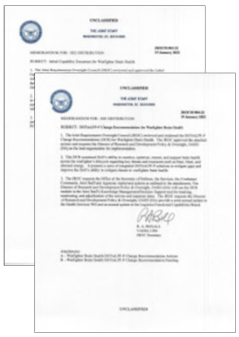
WBH Initiative Strategy & Action Plan



The Deputy Secretary of Defense provided direction for a Comprehensive Strategy and Action Plan for Warfighter Brain Health

Signed on 8 JUN 22, the Strategy and Action Plan synchronized and prioritized efforts into a single brain health approach to produce more efficient and effective results

WBH Joint DOTmLPF-P Change Recommendation (DCR)/ Initial Capabilities Document (ICD)



The WBH CBA assessed DoD's ability to monitor, optimize, restore, and support brain health across the warfighter's lifecycle regarding key threats and exposures such as blast, blunt, directed energy, etc.

Signed on 19 JAN 22 the Final Product: 36 solutions and 74 R&D activities to support optimization of Warfighter brain health

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DoD WBHI: Overview

Mission: Act rapidly to provide products, practices, and policies to directly impact warfighter brain health and performance

End State: Optimize warfighter brain health and performance to maximize Joint Force superiority and lethality in all operating environments

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DoD WBHI: Implementation Areas

- Assess cognitive capabilities
- Monitor brain threats
- Capture and analyze patient data
- Understand effects of exposures and injuries
  - Interface Astroglial Scarring (IAS), Chronic Traumatic Encephalopathy (CTE)
- Implement rapid translation of findings
  - 74 Research &Development activities to support optimization of Warfighter brain health

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DoD WBHI Implementation Area: Assess Cognitive Capabilities

- Obtain baseline for entire force q 5 years (SOCOM q 3 years)
  - Implement within one year of accession
  - To ensure warfighters are performing at optimized capacity and if exposed or injured by a known or emerging brain threat, return our warfighters to full health to include brain health
- Monitor industry and academia for cognitive enhance/restore
  - WBHI Strategy and Action plan: Objective 1bii

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DoD WBHI: Known and Emerging Brain Threats*

- Ballistic Projectiles
- **Blast overpressure**** (include underwater and subterranean exposures)
- Blunt force impact
- Chemical-Biological-Gas toxins
- **Directed energy (i.e. pulsed high power microwave)**
- High G acceleration/vibration/recoil
- Incoming/Near missed impact (ex. Ballistic Missiles)
- Other environmental hazards
- Pressure fluctuations (i.e. aviators)

* Exposures not prioritized

**Mandated by National Defense Authorization Act Fiscal Year 2018 Section 734

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DoD WBHI Implementation Area: Monitor Brain Threats: BLAST

- NDAA FY 18, SEC 734: Longitudinal Medical Study of Blast Overpressure Exposure in Members of the Armed Forces
- ASD/Readiness published Interim Guidance for Managing Brain Health Risk from Blast Overpressure (Recommendation: 4 psi as threshold)
- Linkage of Blast Exposure and Health/Performance Effects
- NATO Human Factors Medicine (HFM): 338 to develop military loading exposure guidelines
  - International effort to translate research findings into practical guidelines to facilitate the development of blast exposure monitoring capability and the capture of health and performance information.

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DoD WBHI Implementation Area: Monitor Brain Threats: AHI

- Anomalous health incidents (AHI) (formerly known as Unconventionally acquired brain injuries, UBIs)
- SECDEF stood up a Cross Functional Team (CFT) in June 2022 to coordinate all DoD and interagency activities
- DHA Updated Guidance for Evaluation of Anomalous Health Incidents (AHI) with specific AHI Acute Assessment tool on 6 September 2022
- AHI Research exploring Source, Propagation, Coupling and Biological Effects and Clinical Effects

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DoD WBHI Implementation Area: Capture and Analyze Patient Data

- Continuous improvement of TBI care with better understanding of
  - Thresholds
  - Relationship between brain exposures and injuries
- Extensive training and education Department-wide and in multiple communities
- Establishment of ICD-10 coding
  - Effective 1 OCT 22: S06.8A Primary blast injury of brain, not elsewhere classified
  - Need AHI code
- Repetitive blast pressure

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DoD WBHI Implementation Area: Understand Effects of Exposures and Injuries

- Late effects vs. long term effects: develop a comprehensive understanding of:
  - The etiology and mechanisms of long-term and late effects of brain exposures and TBIs
  - The contributions of co-occurring conditions that influence functional outcomes, including performance
  - The dose-response rate of brain exposures and/or TBIs needed to induce long-term or late effects
- Continued use of brain tissue repository
- Collaboration with other Government Agencies, industry and academia

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DoD WBHI Implementation Area: Implement Rapid Translation of Findings

- Department in the process of transitioning from TBI (injury) to a brain health framework (evolving through vision setting, RFIs, and RFPs)
  - Entirety of brain health
- Operational and medical
- Initiated development of WBH research strategy
  - Inclusive across spectrum of WBHI (beyond medical)
  - Prioritize research agenda

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DoD WBHI: Assess Cognitive Capabilities
LOE 1- Optimize Cognitive and Physical Performance

- Ability to monitor a warfighter's cognition **and**
- Determine if need to enhance or restore, especially if there has been a decrement through a hazardous brain exposure

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DoD WBHI: Assess Cognitive Capabilities
(Strategy and Action Plan)

OBJECTIVES	1a. Establish Baselines	1b. Enhance Performance	1c. Restore Performance	1d. Awareness & Best Practices
ACTIVITIES	i. Establish Cognitive Surveillance Program	i. Develop or Refine Training & Sustainment Programs	i. Identify Evidence-Based Treatments	i. Develop and Implement Strategic Communication Plans
	ii. Develop Lethality Metric	ii. Monitor Academia & Industry for Applicability	ii. Expand Access To and Use of Treatment Programs	ii. Establish Repository to Share Best Practices
	iii. Develop Additional Indices/Factors/ Modalities	iii. Identify Evidence-Based Solutions	iii. Discover New Evidence-Based Strategies	

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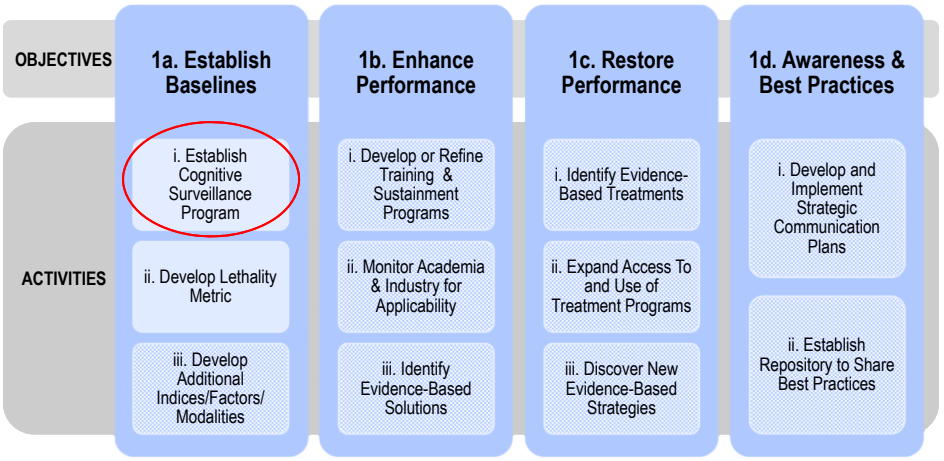
DoD WBHI: Assess Cognitive Capabilities
(Strategy and Action Plan)



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DoD WBHI: Cognitive monitoring (Background)

- A cognitive monitoring program supports:
  - The warfighter's ability to make expedient, effective decisions on the battlefield
  - The Department's pursuit of superior lethality (National Defense Strategy, 2018)
- Department lacks the ability to monitor and optimize warfighter cognitive performance in order to maximize operational readiness
- Identifying a decrease in cognitive performance over time supports SM-level intervention to improve operational readiness
- To achieve a Department-wide cognitive monitoring program, the current neurocognitive assessment program would need to be expanded
  - DoDI 6490.13, "Comprehensive Policy on Traumatic Brain Injury-Related Neurocognitive Assessments by the Military Services"

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DoD WBHI: DoD Neurocognitive Assessment Program (Background)

- DoDI 6490.13 "Comprehensive Policy on Traumatic Brain Injury-Related Neurocognitive Assessments by the Military Services" (2015)
  - Requires all SMs to undergo computerized neurocognitive assessment testing within 12 months prior to deployment
  - Utilizes the Automated Neuropsychological Assessment Metrics (ANAM) computerized tool
    - Assess 7-10 cognitive areas in 15-20 minutes
  - Army is the Program Lead
  - FY19 DoD completed 220K ANAM assessments at 420 military testing sites (CONUS and OCONUS)
  - $6M annual budget; Defense Health Program Operations & Maintenance funded
- TBI medical community accepts ANAM as a surrogate for cognition until a better tool emerges

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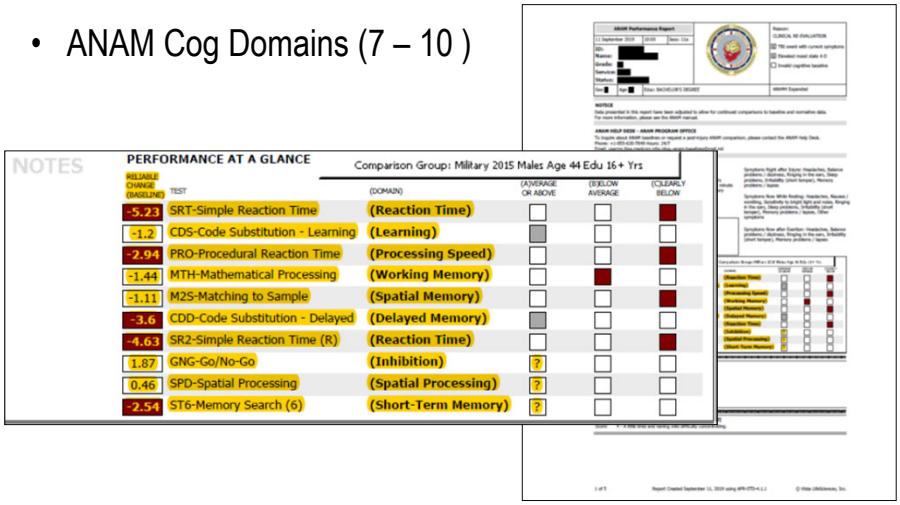
DoD WBHI: DoD Neurocognitive Assessment Program (Background)

- ANAM Cog Domains (7 – 10)



NOTES

PERFORMANCE AT A GLANCE — Comparison Group: Military 2015 Males Age 44 Edu 16+ Yrs

RELIABLE CHANGE (BASELINE)	TEST	(DOMAIN)	(A)VERAGE OR ABOVE	(B)ELOW AVERAGE	(C)LEARLY BELOW
-5.23	SRT-Simple Reaction Time	(Reaction Time)	☐	☐	■
-1.2	CDS-Code Substitution - Learning	(Learning)	■	☐	☐
-2.94	PRO-Procedural Reaction Time	(Processing Speed)	☐	☐	■
-1.44	MTH-Mathematical Processing	(Working Memory)	☐	■	☐
-1.11	M2S-Matching to Sample	(Spatial Memory)	☐	☐	■
-3.6	CDD-Code Substitution - Delayed	(Delayed Memory)	■	☐	☐
-4.63	SR2-Simple Reaction Time (R)	(Reaction Time)	☐	☐	■
1.87	GNG-Go/No-Go	(Inhibition)	?	☐	☐
0.46	SPD-Spatial Processing	(Spatial Processing)	?	☐	☐
-2.54	ST6-Memory Search (6)	(Short-Term Memory)	?	☐	☐

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DoD WBHI: Assess Cognitive Capabilities Implementation (Monitor)

- Deputy's Workforce Council (DWC) discussion on May 18, 2021, endorsed baseline neurocognitive of all Service members every 5 years
- Obtain baseline for entire force q 5 years (SOCOM q 3 years)
  - Implement within one year of accession
  - To ensure warfighters are performing at optimized capacity and if exposed or injured by a known or emerging brain threat, return our warfighters to full health to include brain health
- Updated policy (DoDI 6490.13) began informal coordination on 1 October 2022 with the TBI Advisory Committee (TAC)

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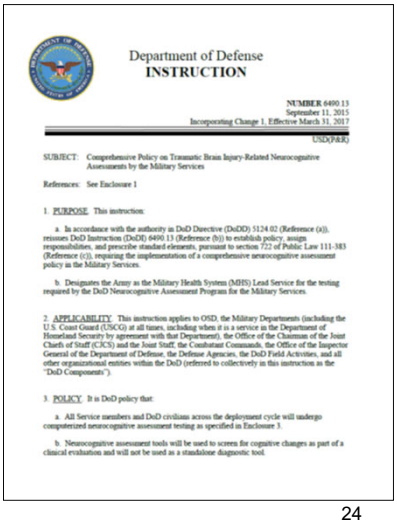
DoD WBHI: Updates to Policy DoDI 6490.13

- Expanded requirement for a **WBH Neurocognitive Monitoring Program**
  - Establishment of a Program Management Program
    - Informatics and Interoperability
    - Operations and Administration
    - Compliance
    - Training and Education
    - Referrals and Follow Up
  - Transition from a deployment-centric, TBI-driven program, to a new framework addressing WBH throughout Service members' careers



Department of Defense
INSTRUCTION

NUMBER 6490.13
September 11, 2015
Incorporating Change 1, Effective March 31, 2017

USD(P&R)

SUBJECT: Comprehensive Policy on Traumatic Brain Injury-Related Neurocognitive Assessments by the Military Services

References: See Enclosure 1

1. PURPOSE. This instruction:

a. In accordance with the authority in DoD Directive (DoDD) 5124.02 (Reference (a)), reissues DoD Instruction (DoDI) 6490.13 (Reference (b)) to establish policy, assign responsibilities, and prescribe standard elements, pursuant to section 722 of Public Law 111-383 (Reference (c)), requiring the implementation of a comprehensive neurocognitive assessment policy in the Military Services.

b. Designates the Army as the Military Health System (MHS) Lead Service for the testing required by the DoD Neurocognitive Assessment Program for the Military Services.

2. APPLICABILITY. This instruction applies to OSD, the Military Departments (including the U.S. Coast Guard (USCG) at all times, including when it is a service in the Department of Homeland Security by agreement with that Department), the Office of the Chairman of the Joint Chiefs of Staff (CJCS) and the Joint Staff, the Combatant Commands, the Office of the Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational entities within the DoD (referred to collectively in this instruction as the "DoD Components").

3. POLICY. It is DoD policy that:

a. All Service members and DoD civilians across the deployment cycle will undergo computerized neurocognitive assessment testing as specified in Enclosure 3.

b. Neurocognitive assessment tools will be used to screen for cognitive changes as part of a clinical evaluation and will not be used as a standalone diagnostic tool.

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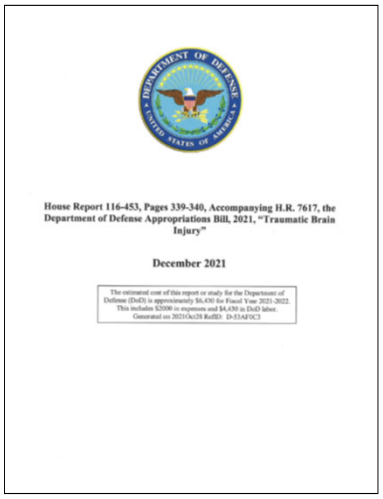
DoD WBHI: Assess Cognitive Capabilities Congressional Interest

FY 21 Report to Congress: A cost analysis plan for implementing cognitive baseline testing for all new military recruits using the ANAM



House Report 116-453, Pages 339-340, Accompanying H.R. 7617, the Department of Defense Appropriations Bill, 2021, "Traumatic Brain Injury"

December 2021

The estimated cost of this report or study for the Department of Defense (DoD) is approximately $6,430 for Fiscal Year 2021-2022. This includes $3500 in expenses and $4,430 in DoD labor. Generated on 2021Oct28 RefID: D-53AF0C3

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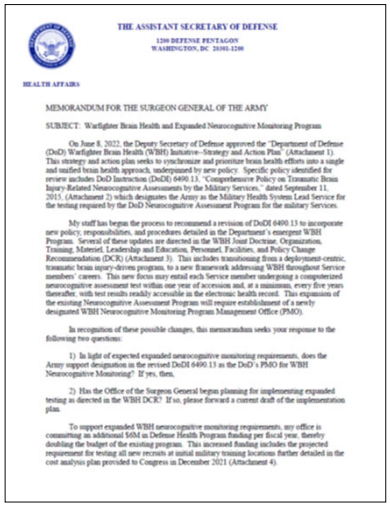
DoD WBHI: Assess Cognitive Capabilities Implementation

Memo sent on 31 OCT 22 from ASD/HA to Army Surgeon General requesting Army's intention to continue to serve as Lead Service in light of expanding requirements beyond pre-deployment testing



THE ASSISTANT SECRETARY OF DEFENSE
1200 DEFENSE PENTAGON
WASHINGTON, DC 20301-1200

HEALTH AFFAIRS

MEMORANDUM FOR THE SURGEON GENERAL OF THE ARMY

SUBJECT: Warfighter Brain Health and Expanded Neurocognitive Monitoring Program

On June 8, 2022, the Deputy Secretary of Defense approved the "Department of Defense (DoD) Warfighter Brain Health (WBH) Initiative–Strategy and Action Plan" (Attachment 1). This strategy and action plan seeks to synchronize and prioritize brain health efforts into a single and unified brain health approach, underpinned by new policy. Specific policy identified for review includes DoD Instruction (DoDI) 6490.13, "Comprehensive Policy on Traumatic Brain Injury-Related Neurocognitive Assessments by the Military Services," dated September 11, 2015, (Attachment 2) which designates the Army as the Military Health System Lead Service for the testing required by the DoD Neurocognitive Assessment Program for the military Services.

My staff has begun the process to recommend a revision of DoDI 6490.13 to incorporate new policy, responsibilities, and procedures detailed in the Department's emergent WBH Program. Several of these updates are directed in the WBH Joint Doctrine, Organization, Training, Material, Leadership and Education, Personnel, Facilities, and Policy Change Recommendation (DCR) (Attachment 3). This includes transitioning from a deployment-centric, traumatic brain injury-driven program, to a new framework addressing WBH throughout Service members' careers. This new focus may entail each Service member undergoing a computerized neurocognitive assessment test within one year of accession and, at a minimum, every five years thereafter, with test results readily accessible in the electronic health record. This expansion of the existing Neurocognitive Assessment Program will require establishment of a newly designated WBH Neurocognitive Monitoring Program Management Office (PMO).

In recognition of these possible changes, this memorandum seeks your response to the following two questions:

1) In light of expected expanded neurocognitive monitoring requirements, does the Army support designation in the revised DoDI 6490.13 as the DoD's PMO for WBH Neurocognitive Monitoring? If yes, then,

2) Has the Office of the Surgeon General begun planning for implementing expanded testing as directed in the WBH DCR? If so, please forward a current draft of the implementation plan.

To support expanded WBH neurocognitive monitoring requirements, my office is committing an additional $6M in Defense Health Program funding per fiscal year, thereby doubling the budget of the existing program. This increased funding includes the projected requirement for testing all new recruits at initial military training locations further detailed in the cost analysis plan provided to Congress in December 2021 (Attachment 4).

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DoD WBHI: Cognitive Enhancement and Restoration

- Enhancement
  - Cognitive Readiness
  - Brain Fitness Centers
  - Research : Software (e.g. Brain HQ)
- Restoration
  - CPG's on Cognitive Rehabilitation (DoD/VA)
  - National Intrepid Center of Excellence and Intrepid Spirit Network

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DoD WBHI: Way Forward

- Full implementation phase
- Priorities:
  - Policy Revisions to 6490.11 and 6490.13
  - Cognitive Monitoring program
  - Matrix the WBH Strategy and Action Plan with the JROCOM to identify gaps and organizational alignment
- Continued Senior Leader Engagement- Updating Health Services Workgroup (HSWG) every 6 months; Logistics Functional Capability Board (LOG FCB) every year; Deputy's Workforce Council (DWC) every 6 months (briefing)

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Questions?

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