

How did the ANAM evolve into an operational and clinical tool?

An assessment of the science, policy, and practices.

Ariba Huda, BSPH¹; Yil Agimi, PhD²; Mark R. Baggett, PhD¹; Rebecca McGavin, MS¹; Jonathan Zeisset, MS¹; Jackie Simpkins, PhD¹; Chris Townsend, BS¹; Timothy Navarro¹, BS; Dhuly Chowdhury, MS¹; Darryl Creel, PhD¹; Madhu Shrestha, MPH¹; Dennis McGurk, PhD¹; Katherine Stout, PT, DPT, MBA²

¹RTI International, Research Triangle Park, NC; ²R2ML, Jersey City, NJ; ³Defense Health Agency Operational Medical Systems, Frederick, MD

Introduction

- ANAM is a computerized neurocognitive assessment used across the DoD to support cognitive assessment.
- Its origins trace to Walter Reed computerized performance testing in the 1980s.
- ANAM has evolved from a research and human performance tool to support concussion assessment and cognitive monitoring.
- This review examines the science, policy, and operational developments that shaped ANAM use and identifies the subtests most frequently used to assess TBI-related cognitive change.

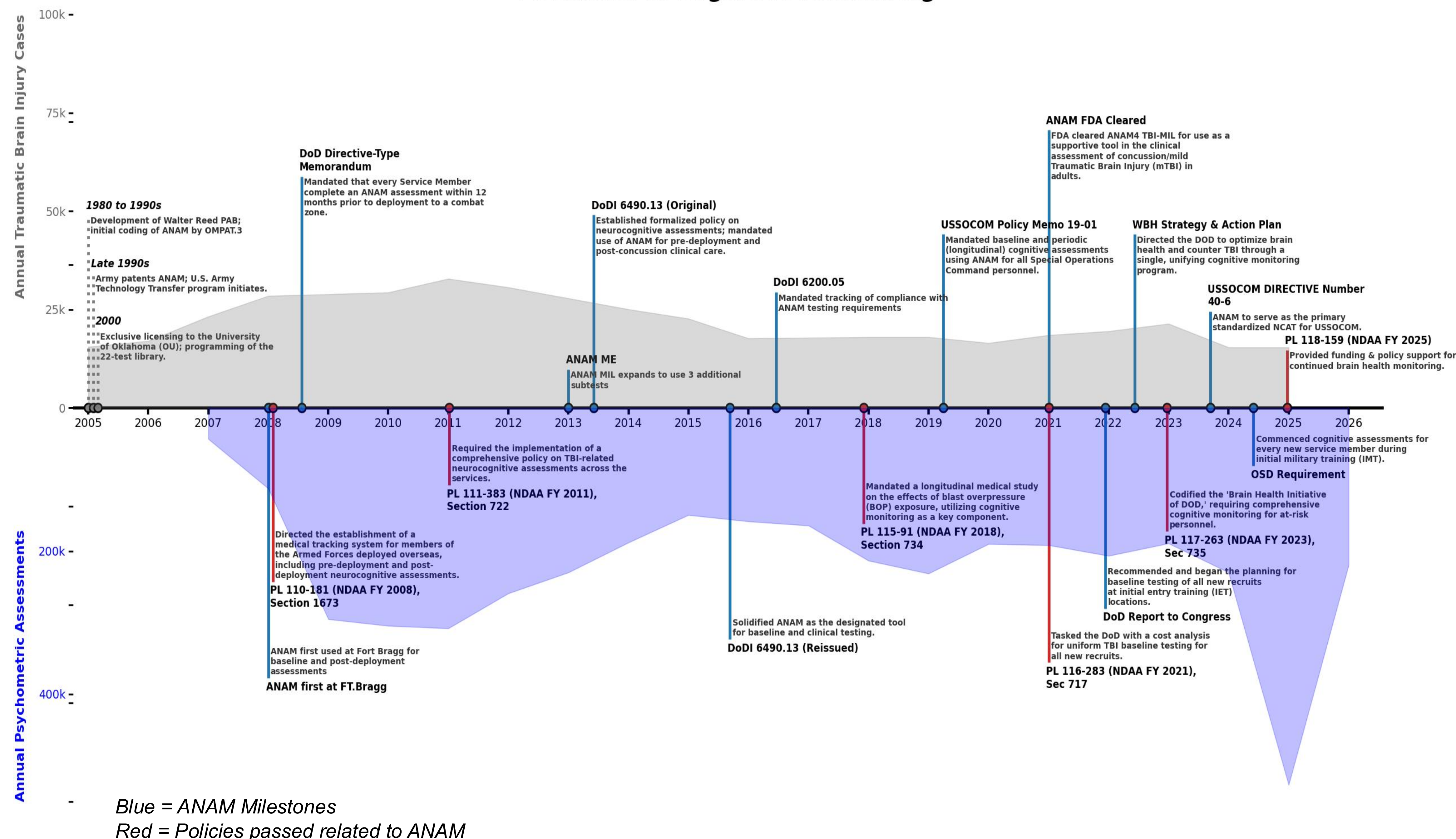
Methods

- Reviewed 118 policy, technical, and scientific sources related to DoD cognitive monitoring.
- Sources included DTMs, DoDIs, DHA policy, Public Laws, Reports to Congress, technical reports, and peer-reviewed studies.
- Examined the historical, scientific, and policy evolution of computerized cognitive monitoring, with emphasis on ANAM.

Cognitive Monitoring Over Time

- 1980s: Walter Reed's Performance Assessment Battery evaluated cognitive performance under operational stressors, including sleep loss, heat, jet lag, and radiation.
- 1990s: The UTC-PAB consolidated computerized cognitive tests; ANAM subsequently emerged as a U.S. Army-developed assessment platform.
- OEF/OIF: Rising TBI rates associated with IED exposure accelerated demand for baseline and post-injury neurocognitive assessment.
- 2008 NDAA: Congress directed pre- and post-deployment neuropsychological assessment of Service members.
- 2015: DoD policy established ANAM for baseline and clinical psychometric testing.
- 2021: ANAM received FDA clearance as a clinical support tool for mTBI assessment.
- 2023–2025 NDAA: Cognitive monitoring expanded to at-risk personnel and initial military training.
- By 2025: Approximately 500,000 ANAM assessments were conducted annually.

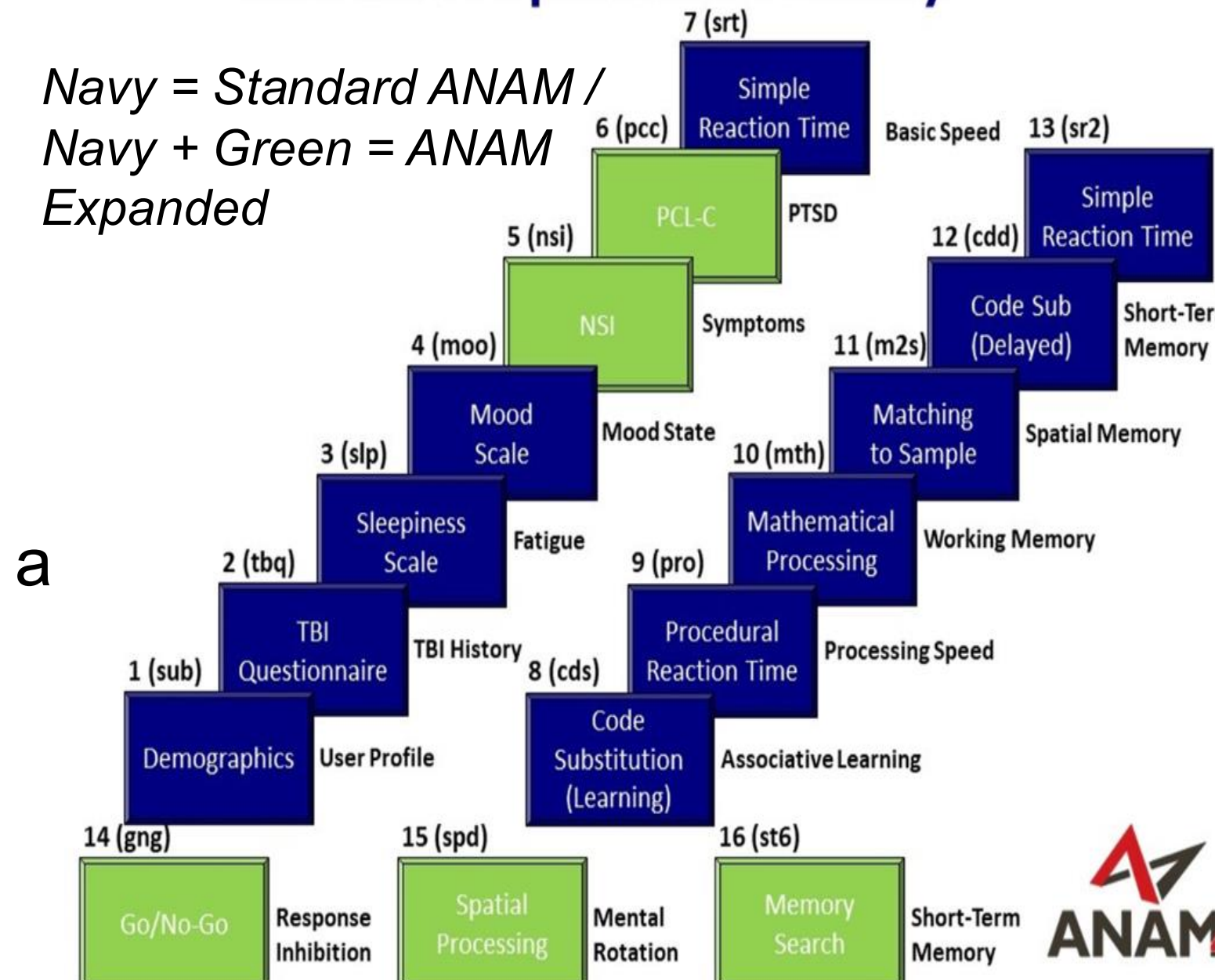
Evolution of Cognitive Monitoring



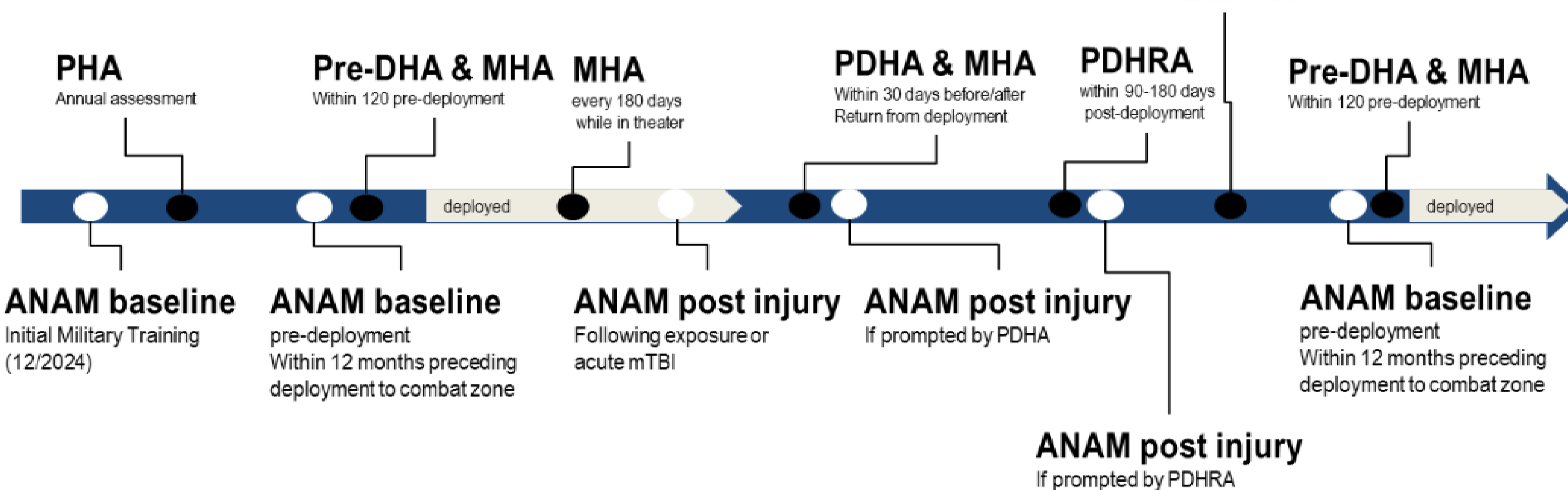
ANAM and the Health Monitoring Ecosystem

- ANAM assesses multiple cognitive domains, including learning, memory, executive functioning, processing efficiency, and cognitive fatigue.
- Self-report measures provide additional information on mood, PTSD symptoms, and other factors affecting performance.
- ANAM is primarily a clinical support tool for mTBI assessment rather than a routine health readiness assessment.
- Its greatest value may lie in integrating baseline testing, post-event assessment, health data, and longitudinal cognitive monitoring.

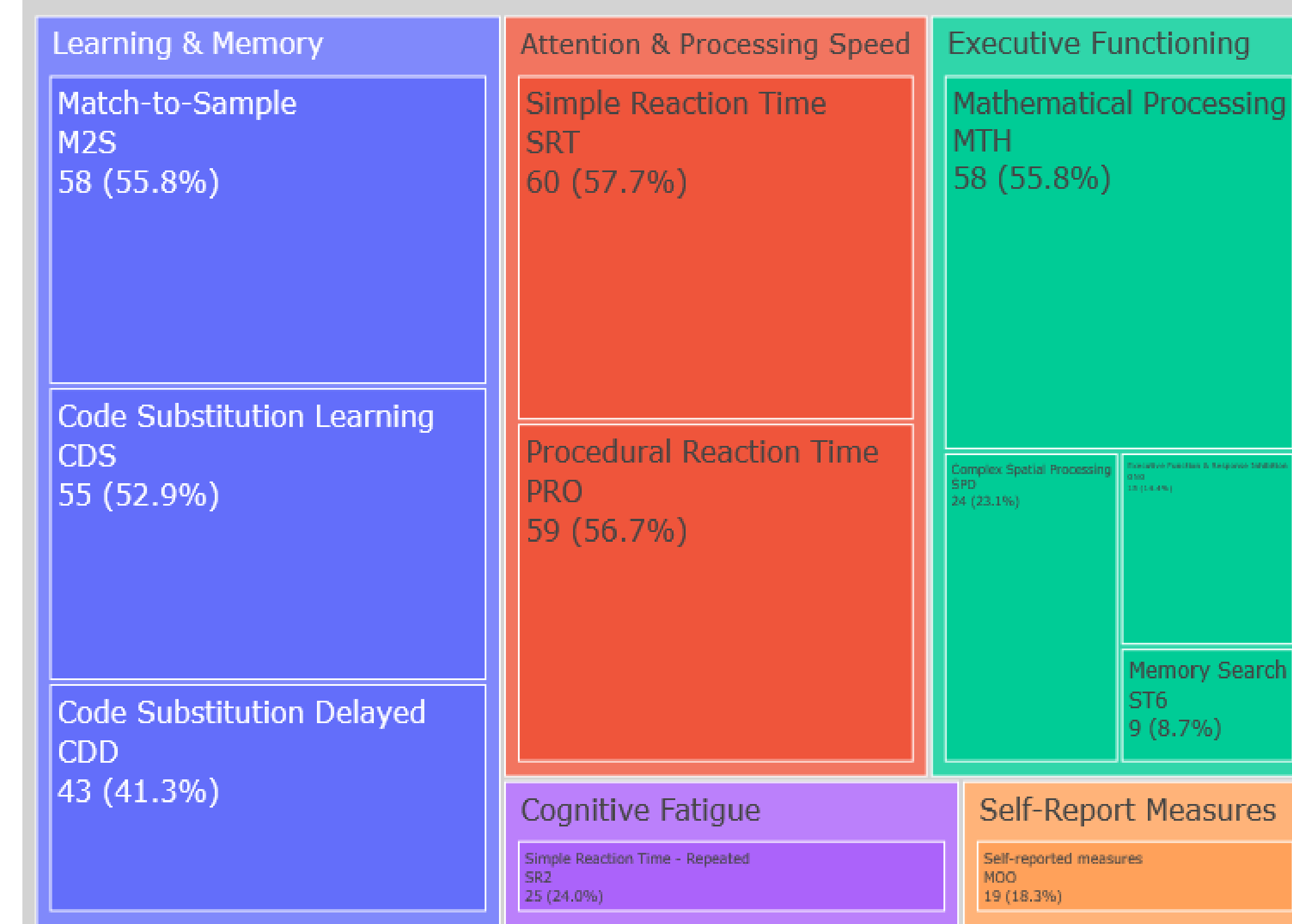
ANAM4 Expanded Battery



PHA



Most Cited ANAM sub-tests used to measure TBI-related deficits



- Reaction time and processing efficiency are the most frequently evaluated indicators of cognitive change.
- Simple Reaction Time (SRT) and Procedural Reaction Time (PRO) are among the most studied ANAM subtests.
- SRT and PRO appear particularly sensitive to acute cognitive change following concussion and operational stressors.

Key Findings

- ANAM originated as a human performance research tool for measuring cognitive effects of operational stress.
- Its use expanded to baseline testing and post-injury cognitive assessment.
- ANAM evolved into the DoD's standardized neurocognitive assessment system supporting concussion management and cognitive monitoring.
- Until recently, current brain health initiatives are expanding ANAM toward longitudinal cognitive surveillance and readiness monitoring.

Limitations

- ANAM is a clinical support tool; not a standalone diagnostic test.
- Performance may be influenced by sleep loss, PTSD, depression, anxiety, pain, and operational stress.
- Repeated testing may introduce practice effects.
- Sensitivity may decline beyond the acute post-injury period.
- Evidence linking ANAM scores to real-world military task performance remains limited.