



Human Systems Work and the Coming Influence on Healthcare

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The Dorsai

- “The small unit tactics in use today and envisioned for the future are not those designed for the wars of the platoons and companies (that) fought in the past.
- “Team, squad and platoon tactics in many ways now bear more resemblance to a group of athletes in a team sport (than to the old fighting units).
- “Current and future tactics aren’t designed for structured armies in solid confrontation with each other.
- “Instead tactics will need to be designed to serve what will be a relatively loose group of independently acting units, the efforts of which are coordinated not so much by a hierarchy of command as by the fact that they share a common conception of the battlespace.”

- Gordon R. Dickson, *Tactics of Mistake*, 1971



Human Systems Work

- *“Man is the first weapon of battle. Let us study the Soldier, for it is he who brings reality to it.”* –
 - Ardant du Picq (1821 – 1870), French Army officer and military theorist; *Battle Studies* published 1880 and 1902
- *“Through investment in its human capital, the Army can maintain the decisive edge in the human dimension – the cognitive, physical, and social components of the Army’s trusted professionals and teams.”* – HD Strategy 2015
- *“Readiness is the Number 1 priority.”* – GEN Milley, CSA Sep/2015
- *“Innovation is the result of critical and **creative** thinking and the conversion of new ideas into valued outcomes.”* –AOC 2014



Human Systems Work



- Research and Development into:
 - Performance enhancement
 - Cognitive optimization
- Human Dimension:
 - Cognitive dominance,
 - Realistic training
 - Institutional agility
- Brain Trainers in Use:
 - Rehab and not Rehab



Research and Development



- Army:
 - MRMC – Military Operational Medicine
 - WRAIR – Neuroscience research
 - USARIEM – Performance optimization
 - ARO – Broad support to academic research
- Academia:
 - UT Dallas BPI – research, development and clinical application
 - UCLA and UBC Vancouver – R&D in performance neuroscience
- Industry: Brain HQ, multiple trainers and devices
- American Academy of Neurology
- Kennedy Forum



U.S. ARMY

Ways

Overall HD Integration

ARCIC (Force 2025B) ★★

Human Dimension Council

CAC (HD Lead) ★★



(LOE formerly known as) Cognitive Dominance

Endstate
An Army of trusted professionals in cohesive teams who adapt and win in a complex world

LOE #1

Physical Supremacy

CAC Lead Integrator
Director, MCCOE



LOE#1: Description

Optimizing intellectual, physical, emotional strength to achieve advantage over a situation or adversary

LOE #2

Talent Management



Realistic Training

CAC Lead Integrator
DCG, CAC-T



LOE#2:

Developing cohesive teams of Army professionals who can adapt and win in ambiguous, complex, and challenging situations

LOE #3

Cross-cutting Concepts

Army Profession, Leader Development



Institutional Agility

CAC Lead Integrator
DCG CAC-E



LOE#3:

Developing the institutional capability to anticipate changing conditions in stride and lead through innovation in advance of need

Continuous Assessment through F2025 Maneuvers and Institutional Army Warfighting Assessments (IAWA)



Brain Trainers

- Great promise
- Many available; some with good evidence of efficacy
- None developed for rehab (although many are used for rehab)
- Brain HQ has the most research data
- A few with proven crossover utility



Achievable Goals

- Reduce training time
- Increase training retention
- Crossover
- Army skills – increase abilities and retention
- Measureable – start w/marksmanship
- Cheap
- Does not add load to existing training time
- Examples:
 - Use scent/odor in training
 - More and more realistic virtual reality
- *“A 20% solution is better than what we have right now – which is nothing.” - Peter Palmer, BG, USA (ret)*



UNCLASSIFIED

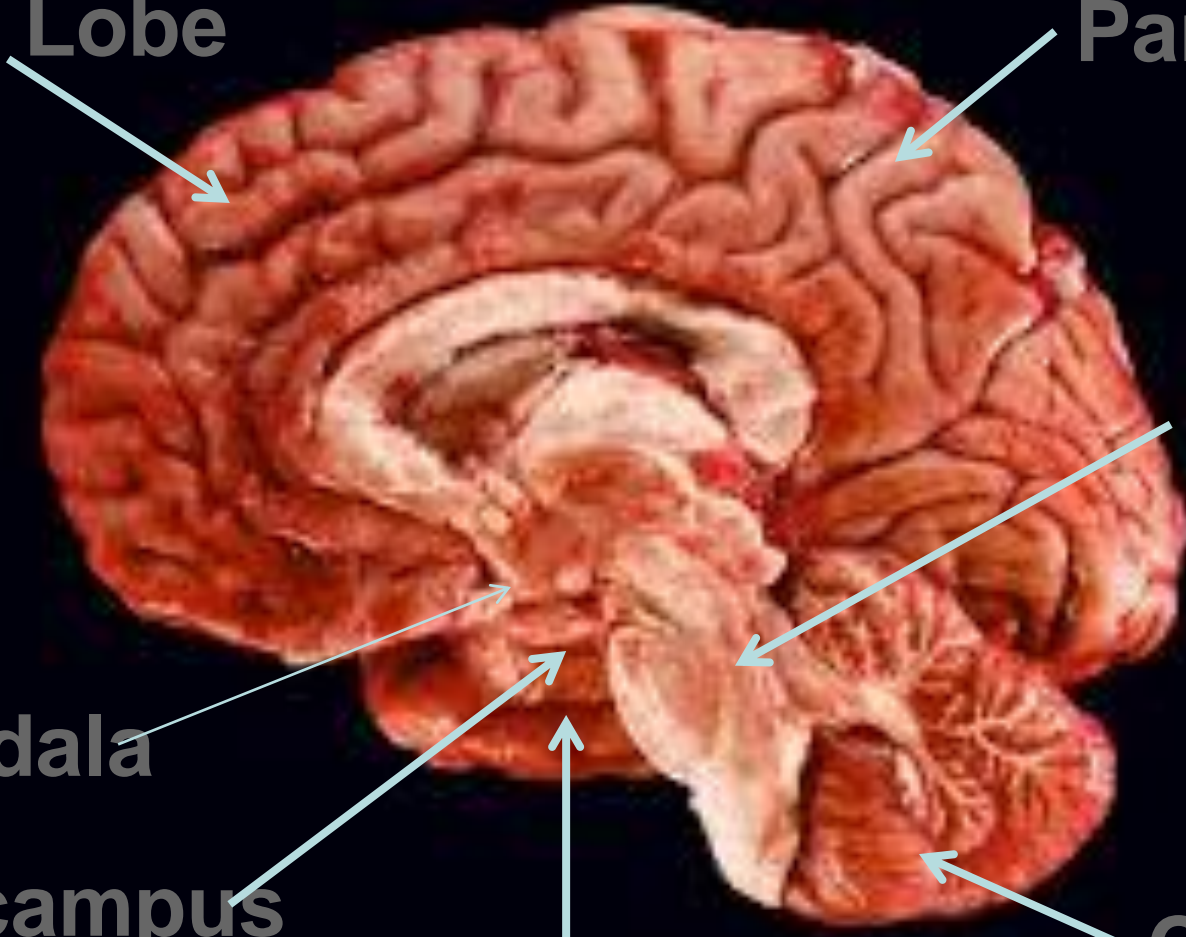




A Little Neuro-Anatomy

Frontal Lobe

Parietal Lobe



Brain Stem

Amygdala

Hippocampus

Temporal Lobe

Cerebellum



It's All About the Brain



- Sleep contributes to memory processing¹
- Aerobic Exercise Increases BDNF²
- Exercise seems to optimize brain function and forestall neurodegenerative diseases such as Alzheimers³
- Administration of acyl-ghrelin can produce long-lasting improvements in... memory⁴

1. Spencer, RM; *Neurophysiological Basis of Sleep's Function on Memory and Cognition*; Physiology, March 2013
2. Leckie, et al; *BDDNF Mediates Improvement in Executive Function...1 Year Trial*; Frontiers in Neuroscience 11 Dec 2014
3. Van Praag, et al; *Exercise, Energy Intake, Glucose Homeostasis, and the Brain*; Journal of Neuroscience; Nov 2014
4. Kent et al; *The orexigenic hormone acyl-ghrelin increases adult hippocampal neurogenesis...*
Psychoneuroendocrinology, Jan 2015



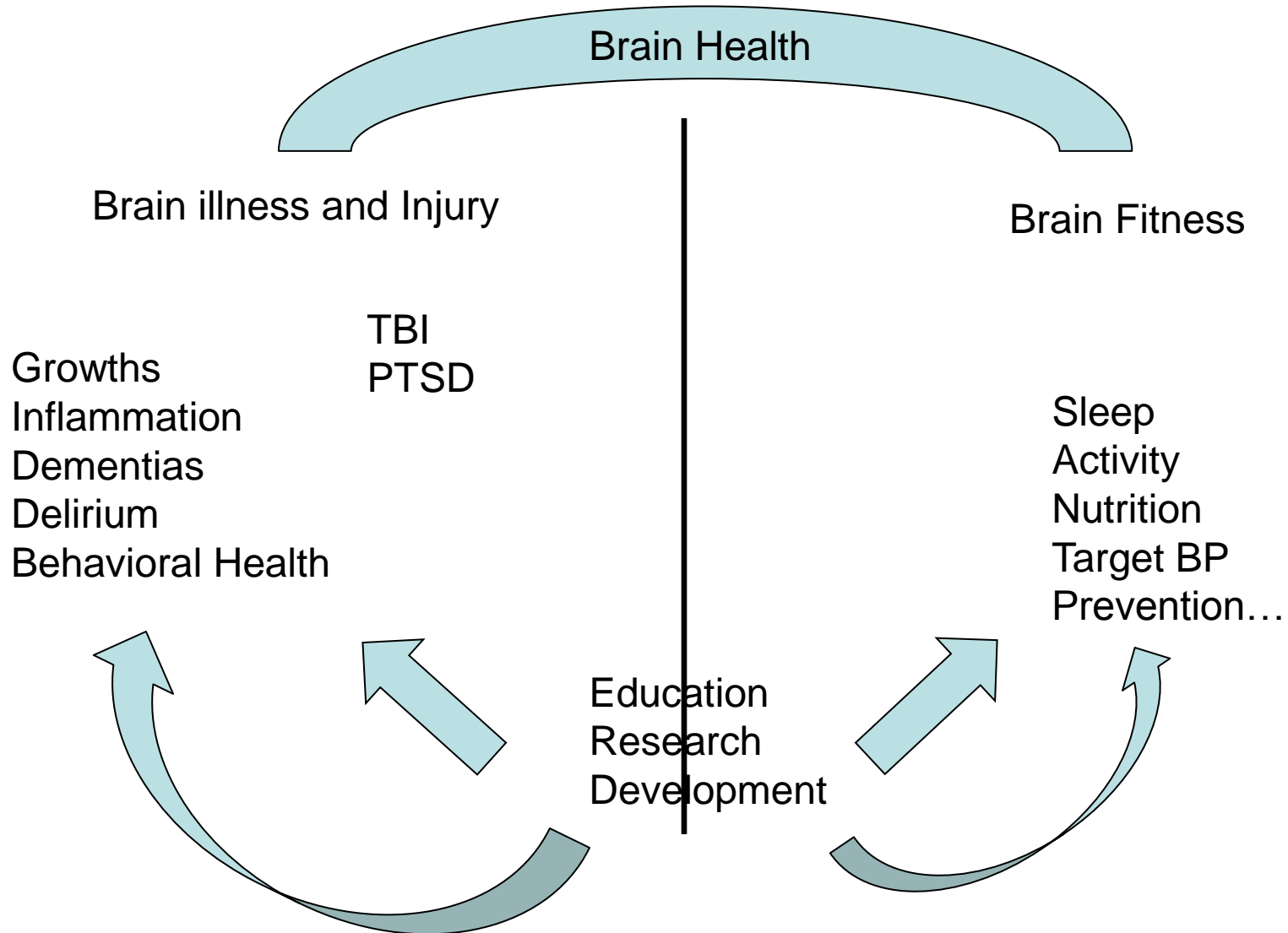
OTSG and the Brain Health Consortium



- System For Health and the Performance Triad
- Brain health is the central component of the Performance Triad
- The Performance Triad is the central component of the System For Health
- It's all about the brain
- Move to Health
- Consortium and products:
 - Military, DOD, academic neuroscientists, practioners and researchers
 - Achieving Cognitive Dominance white paper
 - Overarching brain health program
 - Cognitive enhancement program



OTSG and Brain Health





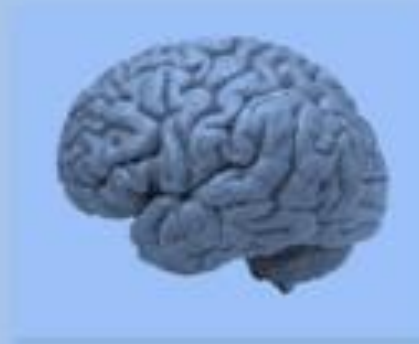
Brain Health and Fitness



Brain Health



Optimal cognitive and emotional fitness enriched by training, learning and improving overall performance



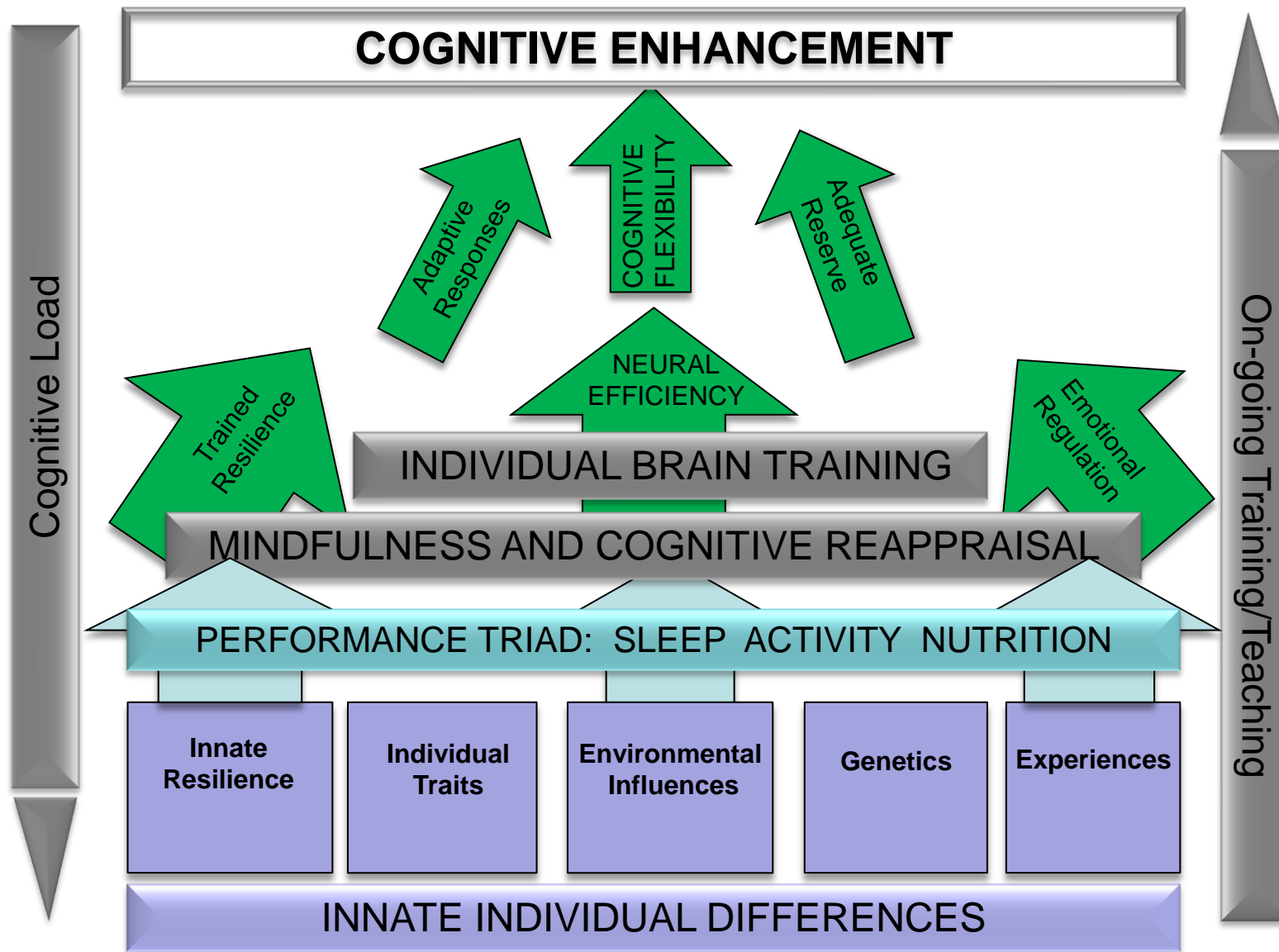
Enriches and improves overall performance through improved attention, reasoning, decision making, problem solving, learning, communicating, and adapting



Brain fitness is the state of cognitive, psychological, and behavioral optimization which enables peak human performance through the brain's capabilities of attention, reasoning, decision making, problem solving, learning, communicating, and adapting

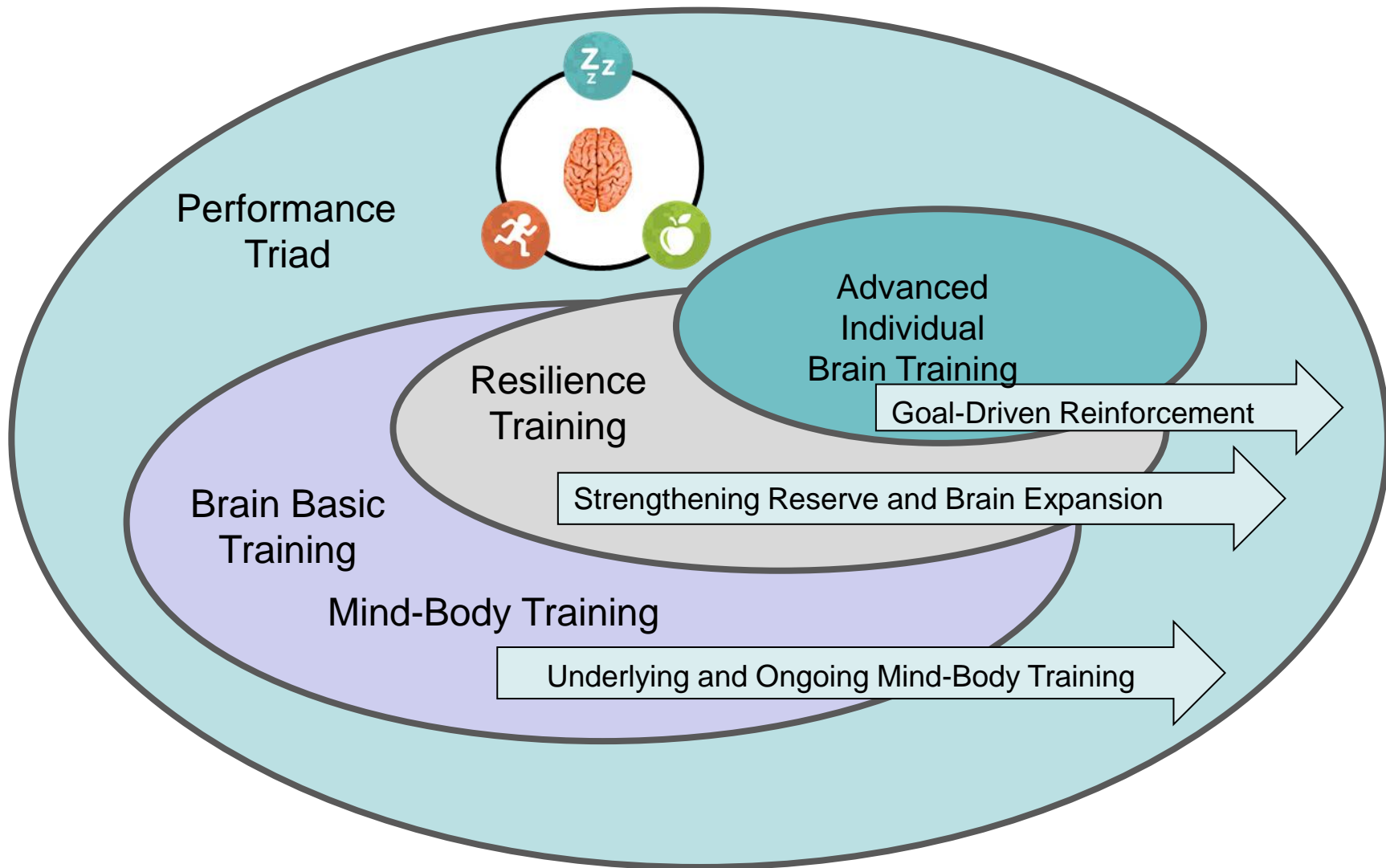


Framework





Cognitive Enhancement Pictogram



COGNITIVE ENHANCEMENT



How Do We Get There?

- Use existing systems and knowledge - BBT
- There is a great deal known about mindfulness training
 - Attention and focus
 - Boosts working memory
 - Decreases stress, anxiety and depression
 - More cognitive flexibility
 - Multiple health benefits. . .
- The Army has a resilience program
 - Self awareness
 - Emotional Control
 - Positive thinking. . .
- Partners: AAN, Kennedy Forum, academia, ARCIC, CAC



Cognitive AIT



- Cognitive Shoe Size
 - Detailed evaluation at initial entry
 - Personality D/Os, Grit, Fitness for duty
 - Tools already exist
 - Huge cost savings possible
- Develop individualized training programs
- We are already using selected brain trainers in rehab
 - BrainHQ
 - CogMed
 - Rosetta Stone's Fit Brains...
- So we can use them in cognitive enhancement



Cognitive Training



- Develop new products
- Brain 101 / 102
 - Soldiers' guide
 - Leaders' guide
- Publish training programs



Into the (Near) Future

- Continue development
 - Multiple brain trainers in use (and being researched)
 - Work w/academia and industry
- Continue research
 - MRMC-led, draft ARO and WRAIR and...
 - Academia – both USUHS and civilian
 - Partner, partner, partner
- Create and publish training programs



It's All About the Brain

- Questions?

