Advances in Neuropsychology since 9/11
(or the evolution of TBI care in the military)

Louis M. French, PsyD
Deputy Director for Operations
NICoE, WRNMMC
Disclosures

• No financial disclosures

• The views, opinions, and/or findings contained in this talk are mine and should not be construed as an official Department of Defense position, policy or decision unless so designated by other official documentation.
Sumeria, 25th Century BC
Test 8

Notice the sample sentence: People hear with the eyes ears nose mouth.
The correct word is ears, because it makes the truest sentence.

In each of the sentences below you have four choices for the last word. Only one of them is correct. In each sentence draw a line under the one of these four words which makes the truest sentence. If you can not be sure, guess. The two samples are already marked as they should be.

SAMPLES

People hear with the eyes ears nose mouth

France is in Europe Asia Africa Australia

1. The apple grows on a shrub vine bush tree
2. Five hundred is played with rackets pins cards dice
3. The Percheron is a kind of goat horse cow sheep
4. The most prominent industry of Gloucester is fishing packing
   brewing automobiles
5. Sapphires are usually blue red green yellow
6. The Rhode Island Red is a kind of horse granite cattle fowl
7. Christie Mathewson is famous as a writer artist baseball player
   comedian
8. Revolvers are made by Swift & Co. Smith & Wesson W. L. Douglas
   B. T. Babbit
9. Carrie Nation is known as a singer temperance agitator suffragist nurse
10. “There’s a reason” is an “ad” for a drink revolver flour cleanser
11. Artichoke is a kind of hay corn vegetable fodder
12. Chard is a fish lizard vegetable snake
13. Cornell University is at Ithaca Cambridge Annapolis New Haven
14. Buenos Aires is a city of Spain Brazil Portugal Argentina
15. Ivory is obtained from elephants mines oysters reefs
16. Alfred Noyes is famous as a painter poet musician sculptor
17. The armadillo is a kind of ornamental shrub animal musical instrument
   dagger
18. The tendon of Achilles is in the heel head shoulder abdomen
19. Crisco is a patent medicine disinfectant tooth-paste food product
Pre-deployment Cognitive Testing
TRĂUMĂ CRANIO-CEREBRALĂ UȘOARĂ

DEFINIȚIE
O trăumă cranio-cerebrală ușoară este o trăumă cauzată de o lovitura la cap, zguduitură sau explozie care disrupe funcționarea normală a creierului. Severitatea trăumei cranio-cerebrale este determinată imediat după trăumă, și se poate clasifica în: ușoară, moderată sau severă.

AȚI ȘTIUT?
Trauma cranio-cerebrală ușoară este cea mai comună formă de trăumă cranio-cerebrală în milităție. Simptomele trăumei ușoare de obicei se rezolvă în câteva zile sau săptămâni.
DVBIC Historical Timeline
1991 - 2002

1991 DVHIP

Brain Injury Resource Kiosk and CD

Brain Injury Association of America Helpline

Standardized Evaluations through DVBIC Network

Name change to DVBIC

1992 Establishment of Lead Sites

1993 Vietnam Head Injury Study (VHIS) Precursor to DVBIC: Analysis and follow-up continue (NIH)

2001 Civilian Partnership: Virginia Neurocare

2003 Organizational Mission Expansion

Research

Education

Clinical
# DoD Numbers for Traumatic Brain Injury Worldwide – Totals

## 2000-2015 Q1-Q2

<table>
<thead>
<tr>
<th>Severity</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penetrating</td>
<td>4,904</td>
</tr>
<tr>
<td>Severe</td>
<td>3,463</td>
</tr>
<tr>
<td>Moderate</td>
<td>28,192</td>
</tr>
<tr>
<td>Mild</td>
<td>274,568</td>
</tr>
<tr>
<td>Not Classifiable</td>
<td>22,042</td>
</tr>
</tbody>
</table>

**Total - All Severities**: 333,169

Source: Defense Medical Surveillance System (DMSS), Theater Medical Data Store (TMDS) provided by the Armed Forces Health Surveillance Center (AFHSC)

Prepared by the Defense and Veterans Brain Injury Center (DVBIC)
GUIDELINES

Guidelines for the management of severe head injury

q. History of head injury associated with any of the following will be cause for a 3-month disqualification for Class 1, and temporary medical suspension from aviation duty for 1 month for Classes 2/2F/3.

1. Post-traumatic syndrome, as manifested by changes in personality, impairment of higher intellectual functions, anxiety, headaches, or disturbances of equilibrium, that resolves within 48 hours of the injury.
2. Post-traumatic headaches alone that resolves within 14 days after injury.
3. Amnesia (post-traumatic and retrograde, patchy and complete), delirium, or disorientation that lasts less than 12 hours after injury.
4. Unconsciousness less than 15 minute
The Development of Guidelines for the Management of Concussion in Sports


The authors are grateful to Carol Mester for her skillful assistance in the preparation of the manuscript.

Address correspondence to J.P. Kelly, Rehabilitation Institute of Chicago, 345 East Superior Street, Chicago, Illinois 60611.

J Head Trauma Rehabil 1998;13(2):53-65
First Lt. John Fernandez is a veteran of Iraq and by now a veteran of Ward 57, too. He reports to an exam room early one morning for his twice-daily dressing change. The former West Point athlete is 25, a newlywed whose wife, [Kristi Fernandez], hasn't left his side since he arrived at Walter Reed six weeks earlier. They had been married less than a month when John shipped out. His hospital room would become their first home together; the nurses looked the other way when Kristi, 22, moved a cot next to John's bed against hospital regulations.

Taking a step, [Garth Stewart] extends his stump as if he still had a leg and foot. "Good, Garth," [Cooks] says, walking alongside. Garth travels 30 feet and then proceeds out the front door of the PT room. A man sitting in the lobby averts his gaze into a magazine, not lifting his eyes until Garth passes. On the most important day of his new life so far, John nearly misses the appointment to get his first artificial limb when a fellow amputee -- a sixtyish stranger -- blocks his wheelchair in the hall and begins spouting advice. John and Kristi listen with polite impatience. The man is diabetic. Once he's out of earshot, they hurry to [Joe Miller]'s lab. "Nothing he said applied," John observes. "I know!" Kristi nearly shouts. "It wasn't vascular, it was a bomb!"
DVBIC Clinical Timeline (2003 – June 06)

AUG 03:
• Screening I MEF at Camp Pendleton using standardized screening questionnaire
• Screening at WRAMC, Soldiers from OIF/OEF

JAN 05:
Ft. Gordon:
Training support for the 249th General Hospital

APR 05:
TBI Surveillance efforts begin per tasking of OTSG and HA

JUN 05:
VA augments DVBIC resources to create Polytrauma system of care
Field Teams sent to Ft. Carson - Screenings begin 2/2

Aug 05:
Screening at Ft. Bragg through SRC

Sep 05:
WRAMC/Polytrauma VTC mtgs begin

MAY 06:
• Training of Guard/Reserve Components
• LRMC begins TBI screening

MAR 04:
• Lessons learned
• Joint Readiness Clinical Advisory Board

APR 06 – MAR 07:
TBI training CONUS and OCONUS

Jun 06:
• DVBIC coordinates w/Brain Trauma Foundation and develops Guidelines for Field Management Combat Related Head Trauma released and disseminated via educational events
The LRMC Prism:

Input: Chaotic, complex compilation of medical records and damage control care processes.

Output: Stable, controlled medical status with an organized, centralized, medical record. Patients distributed in discreet packets throughout CONUS.
TBI Screening
May06 - Aug08

Total Screens
TOTAL Probable
MACE

- MACE was developed by the DVBIC and released in Aug 2006

- History and symptoms are represented by items I-VIII
Standardized Assessment of Concussion (SAC) (McCrea, 2000)

- Embedded in the MACE is the Standardized Assessment of Concussion (SAC), a widely used, validated, brief cognitive tool.

- Gross cognitive tool addressing 4 domains
  - Orientation
  - Immediate memory
  - Concentration
  - Memory recall

- Total score is 30.
Balad Hospital, Sep – Dec 07

• 279 mTBI evaluations conducted
• 167 - 60% outpatients; 112 – 40% inpatients
• 251 – 90% USA Soldiers 93% enlisted, 5% officers, 1% civilians
• The MACE test was given to > 99% of all 279 evaluees
• The ANAM test was given to 99% of all outpatient evaluees (165 of 167)
• The RBANS test was given to 62% of outpatient evaluees (104 of 167)
Official Position of the Military TBI Task Force on

The Role of Neuropsychology and Rehabilitation Psychology in the Evaluation, Management and Research of Military Veterans with Traumatic Brain Injury

APPROVED by:
American Academy of Clinical Neuropsychology (AACN)
American Psychological Association Division 40 (Neuropsychology)
American Psychological Association Division 22 (Rehabilitation Psychology)
National Academy of Neuropsychology (NAN)

Military TBI Task Force Members: Michael McCrea, (Chair), Neil Pliskin (Chair, Division 40 Practice Affairs Committee), Jeffrey Barth, David Cox, Joseph Fink, Louis French, Thomas Hammekes, David Hess, Alan Hopewell, Daniel Orme, Matthew Powell, Ron Ruff, Barbara Schrock, Lori Terryberry-Spohr, Rodney Vanderploeg, Ruth Yoash-Gantz

Approved 2007; published 2008
Section 1–1. Charter And Methodology

On 16 January 2007, Lieutenant General (LTG) Kevin Kiley, The Surgeon General (TSG), chartered a Traumatic Brain Injury (TBI) Task Force (TF) for the Department of Army (DA) to seek a clearer picture of the processes and research involved with the prevention, identification, assessment, treatment, rehabilitation, Family support, and transition to civilian life of Service members with TBI. The Surgeon General appointed the Commander of the Southeast Regional Medical Command (SERMC), Brigadier General (BG) Donald Bradshaw, as the Chair of the TF and appointed other U.S. Army Medical Command (USAMEDCOM) members to the TF. BG Bradshaw invited the Department of Veterans Affairs (DVA), the U.S. Navy (USN), U.S. Marine Corps (USMC), and the U.S. Air Force (USAF) to nominate subject matter experts to the TF. The TF was authorized to operate for 5 months from the commencement of the TF charter.
January 17, 2008

This report details the Task Force's findings and recommendations from January through May 2007. It does not include the actions taken since May 2007 to correct the identified gaps or implement these recommendations. For information about actions already completed and underway, please see the following information paper.

BG Donald Bradshaw
Chairman
Traumatic Brain Injury Task Force
**DVBIC Clinical Timeline (July 06 – Jan 08)**

**Nov 06:** Consensus conference for deployment of Acute Management of mTBI in theatre guidelines

**Feb 07:**
- “Survive, Thrive & Alive” documentary w/ opening by GEN Colin Powell released
- HA Policy expanded TBI Surveillance mission
- Consultative role in released Clinical Management Guidance for non-deployed medical activities (mTBI)

**Aug 06:**
- MACE DEPLOYED

**Aug 07:**
- TBI Consult. In Theatre Consultation

**Sep 07:**
- TBI Military Training Event attended by 800 military providers

**Oct 07:**
- VA/DoD Evidenced Based Work Group: Convened to work on evidence based guidelines for mTBI
- Special Issues mTBI conference

**Oct 06:**
- Neurobehavioral EB Guidelines for Treatment

**Nov 07:**
- Regional Care Coordination Program Launched

**Nov 07:**
- Regional Care Coordination Program Launched
The NEW ENGLAND JOURNAL of MEDICINE

Mild Traumatic Brain Injury in U.S. Soldiers Returning from Iraq

Charles W. Hoge, M.D., Dennis McGurk, Ph.D., Jeffrey L. Thomas, Ph.D., Anthony L. Cox, M.S.W., Charles C. Engel, M.D., M.P.H., and Carl A. Castro, Ph.D.
Mild Traumatic Brain Injury Pocket Guide (CONUS)
## Clinical Practice Guidelines

### DVBIC is leading collaborations to advance evidence-based care

<table>
<thead>
<tr>
<th>Topic</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache Symptom Management – to be released in 2016</td>
<td></td>
</tr>
<tr>
<td>Management of Sleep Disturbances Following Concussion/Mild TBI</td>
<td>Jun 2014</td>
</tr>
<tr>
<td>Progressive Return to Activity Following Acute Concussion/Mild TBI: Guidance for the Primary Care Manager in Deployed and Non-deployed Settings</td>
<td>Jan 2014</td>
</tr>
<tr>
<td>Progressive Return to Activity Following Acute Concussion/Mild TBI: Guidance for the Rehabilitation Provider in Deployed and Non-deployed Settings</td>
<td>Jan 2014</td>
</tr>
<tr>
<td>Neuroimaging Following Mild TBI in the Non-Deployed Setting</td>
<td>Jul 2013</td>
</tr>
<tr>
<td>Assessment and Management of Visual Dysfunction Associated with Mild TBI (in collaboration with the Vision Center of Excellence)</td>
<td>Jan 2013</td>
</tr>
<tr>
<td>Assessment and Management of Dizziness Associated with Mild TBI</td>
<td>Sep 2012</td>
</tr>
<tr>
<td>Indications &amp; Conditions for Neuroendocrine Dysfunction Associated with Mild TBI</td>
<td>Mar 2012</td>
</tr>
<tr>
<td>Indications &amp; Conditions for In-theatre Post-Injury Neurocognitive Assessment Tool Testing</td>
<td>May 2011</td>
</tr>
<tr>
<td>Driving Following TBI</td>
<td>Jul 2009</td>
</tr>
<tr>
<td>Cognitive Rehabilitation</td>
<td>Apr 2009</td>
</tr>
</tbody>
</table>
Indications and Conditions for Neuroendocrine Dysfunction Screening Post Mild Traumatic Brain Injury

Introduction and Background

More than 233,345 traumatic brain injuries (TBI) have occurred in the military from 2000 through December 2011. The majority of these (80-85 percent), have been classified as mild TBI (mTBI). Most patients with mTBI recover completely within three months or less of injury. However a small subset of these individuals experience persistent symptoms and difficulty in rehabilitation, particularly in the setting of co-occurring disorders. Neuroendocrine dysfunction (NED) may be a contributing factor in the setting of prolonged symptoms or difficult rehabilitation following mTBI. NED may adversely affect prognosis and impede recovery from TBI. The diagnosis of NED may be difficult and is sometimes not considered because the symptoms may significantly overlap with post-concussion syndrome as well as other co-occurring conditions such as sleep disorders, PTSD or depression. Service members diagnosed with concussion who are experiencing persistent symptoms suggestive of NED for greater than three months (or new onset up to 36 months) following mTBI may benefit from post-injury NED screening.
Assessment and Management of Dizziness Associated with Mild TBI

Introduction and Background

More than 244,000 service members sustained a traumatic brain injury (TBI) between 2000 and the first quarter of 2012. The majority of these, 77 percent, were classified as mild TBI (mTBI), also known as concussion. While most patients with mTBI completely recover within weeks to months, a small subset of individuals experience persistent symptoms and difficulty in rehabilitation. This is particularly true for mTBI with co-occurring disorders.

Dizziness is a common symptom following TBI and can have a significant impact on a service member’s quality of life. Temporal bone fractures, labyrinthine concussion, benign paroxysmal positional vertigo (BPPV) or central lesions are commonly implicated as causes of vestibular pathology; including the complaint of dizziness after head trauma. Other otologic conditions such as superior canal dehiscence can contribute to dizziness after mTBI.

This clinical recommendation provides the primary care provider an approach to evaluating dizziness following mTBI and guidance regarding referral for further vestibular evaluation and care. The recommendation is based on a review of currently published literature and the proceedings of a consensus conference convened by Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE) in collaboration with the Hearing Center of Excellence in November 2011. The consensus panel included clinical subject matter experts representing the services, Department of Veterans Affairs (VA), DCoE and civilian sectors. The Defense Department’s TBI Quad Services Cell, which includes Army, Navy, Marine Corps, Air Force, Defense and Veterans Brain Injury Center (DVBIC), National Intrepid Center of Excellence, VA, U.S. Central Command and Force Health Protection and Readiness, reviewed the resulting recommendation.
Assessment and Management of Visual Dysfunction Associated with Mild Traumatic Brain Injury

Introduction and Background

More than 253,000 traumatic brain injuries (TBI) have occurred in the military from 2000 through the second quarter of 2012\(^1\). During the height of combat, the numbers of service members who sustained a TBI increased by approximately 10,000 per quarter\(^2\) and the majority of these (80-85 percent) have been classified as mild TBI (mTBI). Although most patients with mTBI recover completely within three months of injury, a small subset of individuals experience persistent symptoms and difficulty in rehabilitation, particularly in the setting of co-occurring disorders.\(^3,\(^4\) Visual dysfunction is a common co-occurring disorder of mTBI and has a significant functional impact on the lives of affected service members and veterans.\(^2,\(^3\) Two of the most common forms of visual dysfunction visual system is highly complex and vulnerable at numerous points to concussive events. This clinical recommendation is intended to offer the medical primary care provider (PCP) an approach to identifying patients with mTBI who may benefit from further eye or vision evaluation and care, as well as recommendations on minimum vision testing. The recommendations are based on a review of current published literature as well as the proceedings of a February 2012 expert panel convened by the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE) and the Departments of Defense and Veterans Affairs’ (VA) Vision Center of Excellence (VCE) that included clinical subject matter experts representing the military services.
Introduction and Background

More than 273,000 service members have sustained a traumatic brain injury (TBI) between 2000 and the first quarter of 2013. The majority of these (approximately 85%) occurred in the non-deployed environment and 82.4% were classified as mild TBI (mTBI), also known as concussion. Neuroimaging following mTBI has been addressed in the deployed setting by the Joint Theater Trauma Systems (JTTS) Clinical Practice Guideline, “Use of Magnetic Resonance Imaging in the Management of Mild Traumatic Brain Injury (mTBI) Concussion in

The guidance contained in this CR represents a review of currently published literature and expert contributions obtained by the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE) in collaboration with clinical subject matter experts representing the Services, Department of Veterans Affairs (VA), academic, research and civilian sectors. The TBI Quad Service group, an inter-agency, multi Service collaborative effort organized by TBI subject matter experts, has reviewed the existing guidance and provided feedback and recommendations. The document is intended to complement existing guidance and improve outcomes for service members with mTBI in the non-deployed setting.
Complementary and Alternative Medicines (CAM), Modalities and Interventions

WHAT IS CAM?
CAM is a group of diverse clinical and health practices and products that are not presently considered to be part of conventional medicine or accepted standards of care; further delineation is below.

- **Alternative medicine** is used in place of conventional treatment.
- **Complementary medicine** is used in parallel with conventional therapies.
- **Integrative medicine** synergistically combines conventional and CAM treatments to achieve safe and effective care.

<table>
<thead>
<tr>
<th>Classification of CAM Modalities</th>
<th>Clinical use of CAM Modalities in Veterans Affairs and the Military Health System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Medicine Systems</td>
<td><strong>Acupuncture</strong> has been used for about 2500 years. It involves insertion of sterile, thin disposable needles into body, ear and scalp points, and may include infrared heat, electro acupuncture and moxibustion. It is used as adjunctive treatment for chronic pain, stress, anxiety, etc.</td>
</tr>
<tr>
<td>Traditional Chinese medicine (acupuncture)</td>
<td></td>
</tr>
<tr>
<td>Naturopathic medicine</td>
<td></td>
</tr>
</tbody>
</table>
DCoE Vision

To be the leader of profound improvements in psychological health and traumatic brain injury prevention and care

- **Psychological Health**
  - VA/DoD CPG: Management of Posttraumatic Stress
  - VA/DoD Health Executive Council
  - VA/DoD CPG: Management of mTBI
  - Policy for Continuity of BH Care for Transferring and Transitioning SMs
  - Policy for Integration of BH in PCMH
  - VA/DoD Health Executive Council PH/TBI Working Group
  - Executive Order: Improving Access to MH Services for Veterans, SMs, and Families
  - Comprehensive Policy for Neurocognitive Assessments
  - Policy Guidance for Management of mTBI/Concussion

- **Traumatic Brain Injury**
  - National Research Action Plan
  - Translation of Research into Practice
  - TBI Pathway of Care
  - DoD/VA PH and TBI Registry
  - Eliminate Gaps in Programs for PH and TBI

- **Congress**
- **White House**
- **DoD**
- **VA**

To be the leader of profound improvements in psychological health and traumatic brain injury prevention and care.
Intrepid Fallen Heroes Fund

The Intrepid Fallen Heroes Fund (IFHF) continues the mission of helping SMs and veterans begun in 1982 by Zachary and Elizabeth Fisher, the founders of the Fisher House Foundation and the Intrepid Sea-Air-Space Museum in New York.

The Center for the Intrepid (CFI) opened at Brooke Army Medical Center in 2007 for amputation prostheses and functional limb loss care.

The successful fundraising efforts of Arnold Fisher have generated philanthropic contributions to the IFHF for advanced medical facilities for service members.

The National Intrepid Center of Excellence (NICoE) is a gift from the American people through the IFHF, built on the NSA Bethesda base in Maryland. The dedication ceremony was on June 2010 and treatment of patients began in October 2010.

The generosity of the Intrepid Fallen Heroes Fund has allowed for nine additional facilities, called Intrepid Spirits, which are located on major military bases throughout the country. The Intrepid Spirits operate using a NICoE-influenced clinical care model with a focus on diagnosis and treatment.
Intrepid Spirits

Open
Broken Ground
Future Site
DVBIC is TBI Pathway of Care Manager

DVBIC is leading collaborations across all MHS TBI Capabilities

(Map reflects DVBIC regions)
NIoCoE Integration

Lead integrated, patient focused, TBI care, research and education on America’s Health Campus

Where We Were

NIoCoE

TBI Clinic

Neurobehavioral Inpatient Unit (7-East)

USUHS

Where We Are Now

NIoCoE Directorate
(Resulting from the merger of NIoCoE and TBI Clinic)
- Shared mission, vision, performance metrics and outcome measures
- Full spectrum of patients and TBI/PH conditions
- One stop shop access to interdisciplinary care in a cohesive pathway of care
- Access to world class providers

NIoCoE Integration

One TBI Pathway of Care

NIoCoE Directorate
- Coordinated intake and referral processes
- Aligned case management

Neurobehavioral in Patient Unit/ TBI Program
- Translational research
- Leverage existing work and access to existing grants
- Build collaborations/partnerships
- Resource utilization (personnel, equipment, IT, data, bio-repository)
- Common Institutional Review Board

TBI Research Synergy Board

USUHS

Clinical Care, Research and Education

(31 JUL 2015)
Partners on America’s Heath Campus

Together WRNMMC, USUHS, NICOE and NIH are leveraging expertise to increase capacity for clinical care, research, and education in order to advance the care for patients and families impacted by TBI.
Sample patient encounters across a NICoE Intensive Outpatient Program stay (19 weekdays)

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individual Sessions:</strong></td>
<td><strong>Individual Sessions:</strong></td>
<td><strong>Individual Sessions:</strong></td>
<td><strong>Individual Sessions:</strong></td>
</tr>
<tr>
<td>- Interdisciplinary Team Intake</td>
<td>- Family Therapy Follow-Up</td>
<td>- Art Therapy Evaluation</td>
<td>- Physical Therapy Follow-Up</td>
</tr>
<tr>
<td>- Audiology Evaluation</td>
<td>- Neurology/Sleep Follow-Up</td>
<td>- Family Therapy Follow-Up</td>
<td>- Psychiatry Follow-Up</td>
</tr>
<tr>
<td>- Family Therapy Evaluation</td>
<td>- Neuropsych Testing 1</td>
<td>- Imaging Review/Sleep</td>
<td>- Discharge Conference</td>
</tr>
<tr>
<td>- Neurology/Sleep Evaluation</td>
<td>- Psychiatry Follow-Up</td>
<td>- Neuropsychology Follow-Up</td>
<td>- Pre-Discharge Meeting</td>
</tr>
<tr>
<td>- Neuropsychology Interview 1</td>
<td>- Physical Therapy Follow-Up</td>
<td>- Physical Therapy Follow-Up</td>
<td>- Medication Reconciliation</td>
</tr>
<tr>
<td>- Neuropsychology Interview 2</td>
<td>- Speech Language Pathology Follow-Up</td>
<td>- Psychiatry Follow-Up</td>
<td>- Meet with Nurse Consultant</td>
</tr>
<tr>
<td>- Nutrition Evaluation</td>
<td>- Team Coordinator Follow-Up</td>
<td>- Speech Language Pathology Follow-Up</td>
<td>- Creative Arts Therapy</td>
</tr>
<tr>
<td>- Optometry Evaluation</td>
<td>- Vestibular Evaluation</td>
<td>- Team Coordinator Follow-Up</td>
<td>- Labyrinth Walk</td>
</tr>
<tr>
<td>- Psychiatry Evaluation</td>
<td>- <strong>Group Sessions:</strong></td>
<td>- <strong>Group Sessions:</strong></td>
<td>- Supportive Counseling Group 3</td>
</tr>
<tr>
<td>- Sleep Study</td>
<td>- Nutritional Practicum Group</td>
<td>- Cognitive Skills</td>
<td><strong>Wellness Activities (Optional):</strong></td>
</tr>
<tr>
<td>- Sleep Education</td>
<td>- Breath &amp; HeartMath</td>
<td>- Music Therapy Group</td>
<td>- Stress Activities</td>
</tr>
<tr>
<td>- Speech Language Pathology Evaluation</td>
<td>- Creative Arts Therapy</td>
<td>- Psychological Health &amp; Recovery</td>
<td>- Acupuncture</td>
</tr>
<tr>
<td>- Team Coordinator Evaluation</td>
<td>- Managing Triggers 2</td>
<td>- Relationships &amp; Intimacy</td>
<td>- Biofeedback</td>
</tr>
<tr>
<td>- Assistive Technology Evaluation</td>
<td>- Supportive Counseling</td>
<td>- Supportive Counseling 2</td>
<td>- Transition Planning</td>
</tr>
<tr>
<td>- Medication Reconciliation/Inventory</td>
<td>- Team Coordinator Follow-Up</td>
<td>- Tinnitus Group</td>
<td>- Canine Assisted Therapy</td>
</tr>
<tr>
<td>- Physical Therapy Evaluation</td>
<td>- Wellness Planning Group</td>
<td>- Mind-body Group 1</td>
<td></td>
</tr>
<tr>
<td>- Wellness Evaluation</td>
<td></td>
<td>- Wellness Planning Group</td>
<td></td>
</tr>
<tr>
<td><strong>Group Sessions:</strong></td>
<td><strong>Wellness Activities:</strong></td>
<td><strong>Wellness Activities:</strong></td>
<td><strong>Wellness Activities (Optional):</strong></td>
</tr>
<tr>
<td>- Relaxation Training</td>
<td>- Biofeedback</td>
<td>- Stress Profile</td>
<td>- Acupuncture</td>
</tr>
<tr>
<td>- Chronic Pain</td>
<td>- HeartMath</td>
<td>- Transition Planning</td>
<td>- Biofeedback</td>
</tr>
<tr>
<td>- Creative Arts Therapy</td>
<td>- Transition Planning</td>
<td></td>
<td>- Transition Planning</td>
</tr>
<tr>
<td>- Intro to TBI</td>
<td>- Canine Assisted Therapy</td>
<td></td>
<td>- Canine Assisted Therapy</td>
</tr>
<tr>
<td>- Managing Triggers 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NICoE Art Therapy
Center for Neuroscience and Regenerative Medicine

Focus of Research Programs
1. Diagnostics and Imaging
2. Biomarkers
3. Neuroprotection and Models
4. Neurogeneration
5. Neuroplasticity
6. Rehabilitation and Evaluation

Leadership Teams of USU/NIH investigators with administrative infrastructure developed by USU across the federal research labs in the National Capital Region

Secondary Network Connections to other universities, private entities, and public entities to collaborate using CRADAs, IPAs, and sabbaticals to transfer ideas and technologies
Whole mount tau (AT8)-immunostained 50-μm coronal sections of the brainstem from case 3 showing severe involvement of the locus ceruleus, pontine tegmentum, pontine base, midline medulla, and hypoglossal nuclei.
Figure 2. Association of increasing Framingham Risk Score (FRS) and coronary artery calcium in patients with (black bars) and without (gray bars) post-traumatic stress disorder.

Ahmadi et al., 2011  American Jrnl of Cardiology
H. R. 5122

One Hundred Ninth Congress of the United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Tuesday, the third day of January, two thousand and six

An Act

To authorize appropriations for fiscal year 2007 for military activities of the Department of Defense, for military construction, and for defense activities of the Department of Energy, to prescribe military personnel strengths for such fiscal year, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; FINDINGS.

(a) SHORT TITLE.—This Act may be cited as the “John Warner National Defense Authorization Act for Fiscal Year 2007”.
15 Year Studies

Archival Studies
- Existing Databases
  - CTF & CORE: WRAMC/WRNMMC
  - Scientific Directors
    - Drs. Rael Lange and Tracey Brickell

Natural History Study
- Comprehensive Pathway
  - Scientific Director
    - Dr. Rael Lange

- Brief Pathway
  - Scientific Director
    - Dr. Tracey Brickell

Caregiver Study
- Three Study Phases
  - Scientific Directors
    - Drs. Tracey Brickell and Rael Lange

TBI Outcome (Acute)
- Neurocognitive/Neurobehavioral
  - Influence of Bodily Injury,
  - Poor Effort, Blast, TBI Sev
  - Risk factors of PTSD & PCD

TBI Outcome (Chronic)
- Neurobehavioral/HRQOL
  - 5-year longitudinal outcome
  - Risk factors of poor recovery within first 5 years of injury

Blood Banking
- Genomics
- Proteomics

Sensory/Motor
- Vestibular
- Speech Pathology
- Audiology
- Optometry
- Physical Therapy

Neuroimaging
- DTI
- MR Spectroscopy
- SWI
- fMRI
- SPECT/PET

Neurocognitive
- Attention/Concentration
- Executive Functioning
- Visuospatial
- Language
- Processing Speed
- Memory

Neurobehavioral
- Postconcussion Sx
- Posttraumatic Stress
- Psychological
- Combat Exposure
- HR-QOL
- Psychopathology

Clinical Interview
- Health/Mental Health
- Return to Duty
- Access/Barriers to Care
- Health Care Needs
- Family/Marital
- Service Needs

HRQOL Evaluation
- Caregiver Burden
- Access/Barriers to Care Health
- Care Needs
- Family/Marital

HRQOL Development
- Use PROMIS Methodology
- Identify TBI-CareQOL Items
- Validate TBI-CareQOL
- Develop CATs & Short Forms

Sci. Directors
Drs. Rael Lange and Tracey Brickell

Sci. Directors
Drs. Tracey Brickell and Rael Lange

Sci. Directors
Drs. Rael Lange and Tracey Brickell
Thank You

Louis.m.french.civ@mail.mil
301-319-2418