NATIONAL INTREPID CENTER OF EXCELLENCE

ANNUAL REPORT 2014

HOPE, HEALING, DISCOVERY AND LEARNING

Colleagues:

In the increasing wake of the wars in Iraq and Afghanistan, investigating traumatic brain injury (TBI) and its implications for psychological health (PH) is of undeniable importance. The Military Health System (MHS) is leading much of this effort with respect to research and clinical care for the members of our armed forces.

The National Intrepid Center of Excellence (NICoE) opened in 2010 and has been an integral entity within the MHS's continuum of care, providing aid for service members suffering from the effects of TBI/PH conditions while conducting ground-breaking research for future generations' benefit. The effects of combat-related TBI/PH are expected to persist for years to come, making treatment and prevention advances extremely valuable.

We are proud of the NICoE's many accomplishments achieved throughout fiscal year (FY) 2014 and the organization's ever-increasing ability to serve its complex patient population. This second Annual Report encapsulates these key successes and recognizes progress made by the NICoE's dedicated staff. It demonstrates how the NICoE is caring for injured service members, conducting important research with cutting-edge technology, educating care providers of the future, and contributing to the larger TBI/PH community and the MHS TBI Pathway of Care (the Pathway).

The NICoE was honored to receive multiple significant accolades this past year. In FY14, the organization was nominated by the Special Operation Forces community for the Military Officers Association of America (MOAA) Community Heroes Award, which "spotlights the extraordinary efforts of the caregivers who provide service to the wounded military and veterans' populations. The intent of these awards is to demonstrate that there is a continuum of caregiving and that there exists a broad spectrum of individuals, both within the military base community and in the civilian community."

In October 2014, the NICoE was one of 10 public sector information technology projects recognized at the annual Government Computer News gala for excellence in "Big Data" IT innovation and teamwork. The NICoE's Continuity Management Tool project was awarded among hundreds of projects from federal, state and local agencies for their use of existing software and hardware, along with collaboration with clinicians and researchers, to collect more than 46,000 data points per patient. Additionally, the NICoE's 2013 Annual Report won the Platinum Award in the League of American Communications Professional LLC 2013 Vision Award Annual Report Competition. This competition drew one of the largest numbers of submissions ever, representing a broad range of industries and organizational sizes.

Following the 2014 decision to fully integrate the TBI/PH centers throughout the MHS, the NICoE will continue to collaborate and work within the Pathway in order to best serve America's heroes. The NICoE looks forward to working closely with the Walter Reed National Military Medical Center, utilizing and sharing resources so we can always say yes to our patients seeking the best care the MHS has to offer.

Guided and inspired by critical strides made in FY14, the NICoE's dedicated staff looks forward to building partnerships, furthering research discoveries, providing excellent patient care and communicating these best practices to TBI centers of care throughout the MHS as members of the Pathway moving into FY15.

Sincerely,

Brigadier General Jeffrey B. Clark
Medical Corps, United States Army
Director, Walter Reed National Military Medical Center at Bethesda

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I. INTRODUCTION

"The NICoE shall provide a national level capability to address the most complex diagnostic and treatment challenges for patients with TBI and psychological and social challenges who have persistent impairment of function despite intensive treatment. The NICoE will conduct complex diagnostic evaluations and holistic intensive day treatment to clarify diagnosis, begin long-term recovery and instill hope for patients and their families. The NICoE will also conduct translational research to foster improved outcomes across the enterprise and beyond."

– Dr. Jonathan Woodson, Assistant Secretary of Defense for Health Affairs

The National Intrepid Center of Excellence (NICoE) is the Military Health System's (MHS) clinical research institute for complex, comorbid traumatic brain injury (TBI) and psychological health (PH) conditions. The NICoE's mission is executed through the integrative efforts of three departments within the organization: clinical care, research, and education and training. These departments and their dedicated staff help the NICoE deliver comprehensive and holistic care, conduct focused research, and export knowledge to benefit service members, their families and society.

TBI/PH conditions negatively impact thousands of service members and their families every year. The NICoE works to alleviate the difficult, damaging effects of these conditions using a unique, innovative interdisciplinary model for individuals experiencing persistent symptoms. The combination of different therapies used at the NICoE creates a comprehensive, personalized treatment approach that provides relief for suffering service members and their loved ones.

Throughout the last year, NICoE leadership tracked their organizational goals, objectives and priorities, realigning them as necessary to address the organization's transitioning state. This year's Annual Report details the NICoE's growth and accomplishments throughout FY14 prior to the organization's recent integration into the Walter Reed National Military Medical Center's (WRNMMC) TBI/PH unity of effort.

MISSION

The NICoE is dedicated to advancing our understanding of TBI and PH conditions. We diagnose and initiate treatment for patients referred with complex, comorbid TBI/PH conditions, we conduct focused research, and we export knowledge and practices to improve TBI and PH outcomes for service members, their families and the MHS.

VISION

The NICoE strives to be the nation's institute for TBI and PH, dedicated to advancing science, enhancing understanding, maximizing health and relieving suffering.

VALUE PROPOSITION

- Improving outcomes for patients with complex TBI and PH conditions by partnering with referring providers in interdisciplinary, multi-modal diagnosis and intensive treatment when indicated
- Conducting clinical research linking pathophysiology and interventions to improved outcomes, leading to the development of new diagnostic and treatment approaches
- Partnering to implement improvements across the MHS and demonstrate better outcomes in TBI and PH conditions

II. THE NICOE'S FIVE-YEAR STRATEGIC PLAN

The NICoE's five-year strategic plan was initially developed in February 2012. Each subsequent year, the NICoE has developed priorities for the year ahead to help refine and advance the organization's overall five-year strategy.

In the FY13 Annual Report, the NICoE leadership identified five main focus areas they wished to pursue during FY14. Those areas were:

1. Translating clinical observations and discoveries into clinical recommendations for standardization of care with improved outcomes
2. Strengthening infrastructure and processes to align with the defined research agenda
3. Continuing research collaborations and information sharing with key organizations and Intrepid Spirits
4. Engaging internal and external partners to help communicate the NICoE's distinct mission
5. Maximizing efficient and effective use of the NICoE's talent

Throughout the FY14 Annual Report we will highlight where the NICoE has made strides within these five priorities and how the organization's accomplishments are moving the NICoE toward accomplishing their five-year strategic vision.

III. DESIGNING A SOLUTION SHOP BUSINESS MODEL

In addition to developing a long-term strategic plan for the NICoE, leadership also identified the need for, and importance of, developing a business model for the organization in FY14. Business models are often developed to define how an organization creates, delivers and captures its value in addition to outlining the organization's purpose, customers and operational processes. A good business model enables the organization's leadership to communicate and explain their corporate practices to stakeholders and provides a template from which the organization can evaluate and refine those practices internally.

The NICoE set out to develop a business model and an associated set of executive-level metrics to track the organization's progress, impact and adherence to its mission and objectives. Through this process, it became clear that the NICoE's operational model is very similar to that of the Cleveland Clinic's, which is considered a "solution shop" business model—using the expertise of highly trained specialists to solve unstructured problems and organize its corporate practices around intuitive diagnostic processes[1].

With this in mind, the NICoE also fits the definition of a solution shop solving problems for individuals and the system by assisting military treatment facilities (MTFs) in administering world-class care to patients while conducting ground-breaking research to further the MHS's understanding of complex TBI/PH conditions. The development of this solution shop business model provided the organization with a framework for facilitating the improvement of strategies for clinical operations and aided in the development of metrics to measure the NICoE's effectiveness with respect to its primary customers and stakeholders.

The NICoE leverages it's solution shop business model to provide value-based healthcare that is organized around maximizing value for it's patients. The organization is able to do this by providing the best health outcomes at a lower cost to service

1. Wanamaker, B., & Bean, D. (2013, September 18). Why Cleveland Clinic always wins: the Solution Shop business model. Retrieved from Clayton Christensen Institute for Disruptive Innovation website: http://www.christenseninstitute.org/why-cleveland-clinic-always-wins-the-solution-shop-business-model

members with comorbid TBI/PH conditions[2]. The NICoE's value-based approach helps leadership improve the efficiency and effectiveness of care by moving away from traditional healthcare systems, which focus on volume and profitability of services provided, to a system organized around patient needs and health outcomes.

This concept of value-based healthcare is an inherent foundation to the NICoE's mission. The NICoE provides innovative treatment and intervention for service members whose symptoms have not responded to treatment elsewhere. Consistent with the value-based healthcare principles, the NICoE provides:

- Clinical service delivery organized around providing high quality, patient-centered healthcare in a cost-effective manner
- Clinical services focused on diagnosis and treatment of specific TBI/PH conditions
- An integrated, co-located team of highly trained specialists delivering clinical care
- Partnerships with other treatment facilities to ensure patients receive healthcare services that span the continuum of care
- Program effectiveness measured by evaluating patient health outcomes as well as traditional measures of productivity and efficiency

As a solution shop, the NICoE's key strengths are found in its resources: the expertise and dedication of its staff, the cutting-edge technology residing within the NICoE and the healing environment evoked from the architecture of the building. The business model focuses on leveraging these resources to initiate treatment for the patient cohort.

In FY14, the newly developed business model pushed the organization toward achieving its goals by:

- Improving tools to account for time, resources and deliverables
- Identifying the NICoE's capacity to increase clinical volume
- Increasing relative value unit (RVU) output by offering additional clinical services in addition to the four-week cohort and improving coding
- Assisting WRNMMC with recapturing leakage into private sector care
- Determining what levels of evaluation and treatment the current program structure can accommodate
- Meeting the current four-week program maximum enrollment

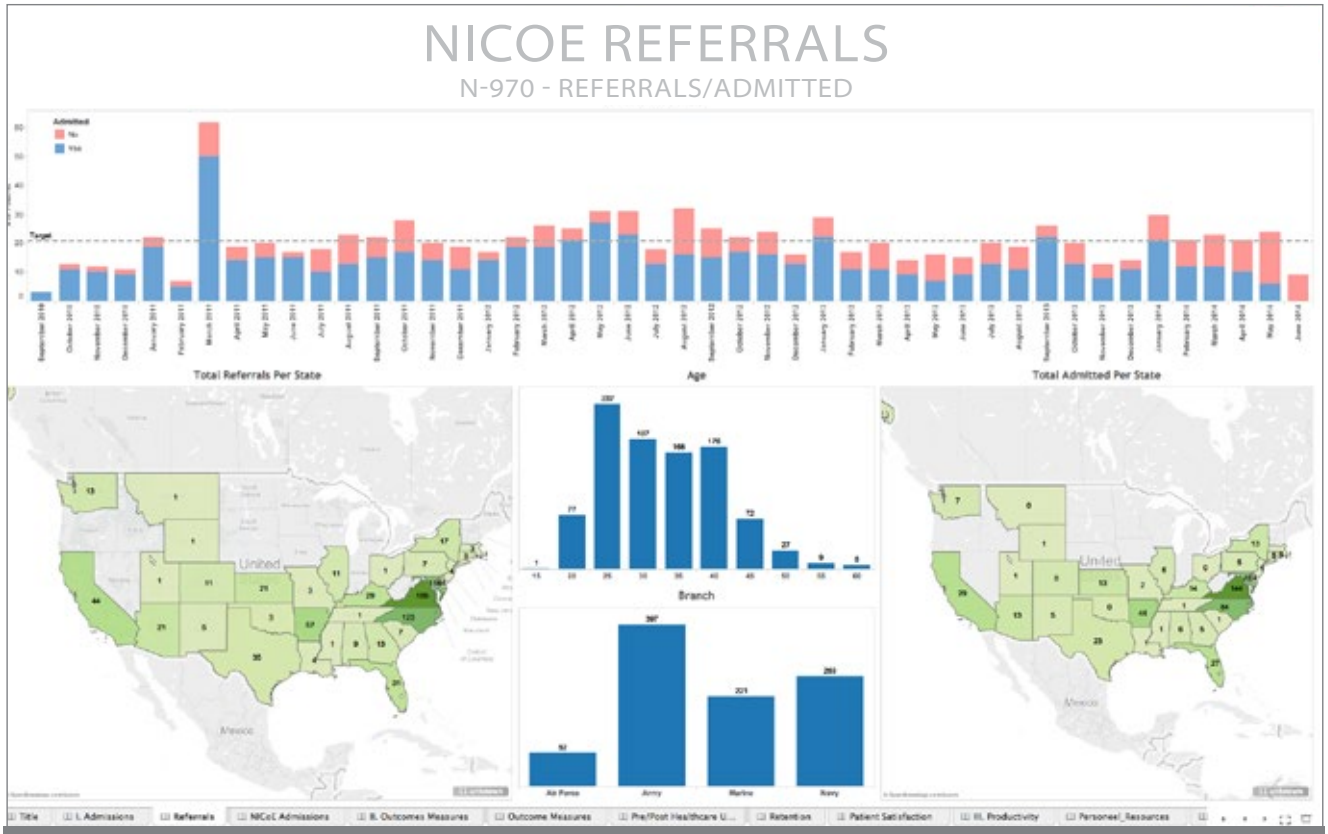
2. Porter, M.E., & Lee, T.H. (2013, October). The Strategy That Will Fix Health Care. Harvard Business Review, pp. 50-70.

CAPTURING THE NICOE'S PERFORMANCE MEASURES

Out of the development of the NICoE's business model came the implementation of an Executive Dashboard, which uses metrics to support the NICoE leadership in assessing the business condition of the organization. This dashboard provides data in a consolidated format in order to enhance the NICoE leadership's ability to make smart and informed management decisions around:

- Efficient utilization of the NICoE's resources
- Areas to target for corrective actions (e.g., efforts to increase referrals)
- Changes/improvements/modifications to the four-week program
- Changes/improvements/modifications of the non-cohort clinical service offerings
- Areas to improve the NICoE's value to the MHS

The NICoE leadership identified 18 different priority measures to incorporate and track in the Executive Dashboard. These priority metrics are important because they help the organization track and measure how they are solving problems for service members that were not addressed through conventional treatments, improving the system of care as a whole and promoting efficiency of care within the MHS. By capturing this information, the NICoE leadership is better able to articulate their business practices to stakeholders and evaluate and refine internal practices and metrics to help guide the organization for years to come.



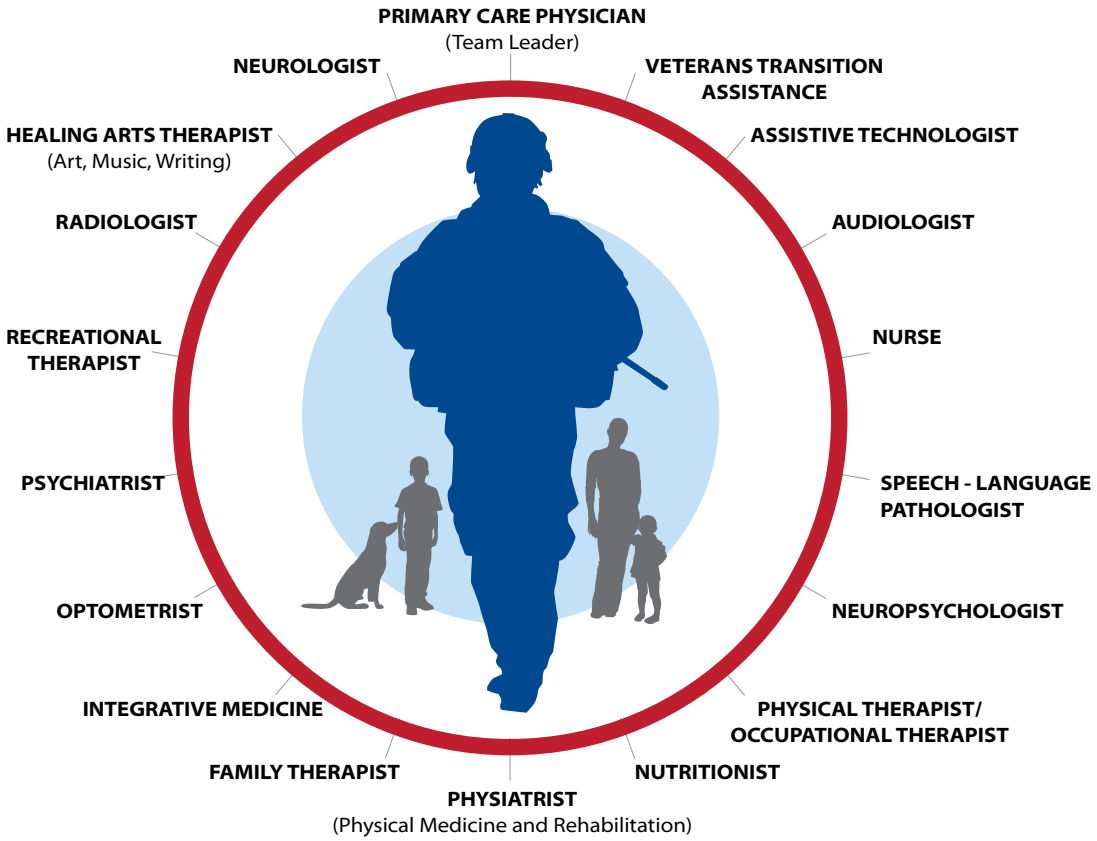
NICoE Executive Dashboard: Referrals Tab
The screen capture of the NICoE's Executive Dashboard shows an example of the NICoE's patient referral numbers and locations. This information aids in increasing referrals by helping the NICoE leadership determine whom they need to communicate with regularly to recruit additional referrals and where they should focus on developing new relationships.

IV. THE NICOE'S HIGH-TECH AND HIGH-TOUCH CLINICAL MODEL

The NICoE combines integrated referral management, comprehensive assessment and intensive interdisciplinary outpatient treatment to patients with complex TBI/PH conditions. All services are anchored by an interdisciplinary, holistic, patient-centered approach to clinical care that empowers service members to achieve long-term balance, optimum healing (physical, mental, emotional and spiritual) and personal well-being.

The NICoE facility provides a unique healing environment, co-locating an interdisciplinary team of providers with state-of-the-art equipment. The NICoE works cohesively with MTF providers to create sustainable treatment opportunities and improve outcomes for patients' long-term recovery. This enables the NICoE to deliver unparalleled coordination of patient- and family-centered care in a high-tech/high-touch environment.

> *"You can't improve on the collaboration that exists at NICoE. This is not duplicated anywhere else in the medical community. The holistic approach gives the warriors what they need in the best possible forum.*
>
> *I can't thank you all enough!"*
>
> ***– NICoE Patient***



INTERDISCPLINARY CARE IN AN INTEGRATED PRACTICE UNIT

In FY14, the NICoE focused on taking their already developed and practiced interdisciplinary model and employing it in an Integrated Practice Unit (IPU) setting. As an IPU, the NICoE is structured to organize its practices around the customer and the patient population need. In healthcare, that requires a shift from organizations siloed by specialty department and discrete service to organizing around the patient's medical condition.

The NICoE does not just treat the disease but also the related conditions, complications and circumstances that commonly occur alongside TBI/PH conditions. This effort not only provides treatment to the patient but also assumes responsibility for engaging patients and their families in the care process (e.g., providing education and counseling; encouraging adherence to treatment and prevention protocols; supporting needed behavioral changes such as smoking cessation or weight loss). In this IPU, the NICoE personnel work together as an interdisciplinary team toward a common goal: maximizing the patient's overall outcome as efficiently as possible.

The unique combination and co-location of the NICoE's interdisciplinary team of clinicians facilitates a coordinated effort for the duration of each patient's stay. Patients and their families receive more than 100 provider encounters throughout the course of their treatment, using specialized imaging and clinical equipment and participating in individual, group and family programs.

The NICoE's interdisciplinary model pulls from the best of Western (traditional) medicine, complementary and alternative approaches, as well as mind-body skills. The NICoE's individualized treatment plans include a combination of these modalities and aim to suit the needs and preferences of patients while providing them with the skills for self-management to maximize their long-term health outcomes.

> *"During my time at the NICoE, I was able to work alongside experts in conceptualizing TBI care in a multidisciplinary manner not available anywhere else. Because of the foresight of integrating metrics into patient care, it was easy to jump into a project and mine that data for results. The staff's proactive approach to developing both a patient-centered and scholarly culture is unlike anywhere else I have been. By the end of my rotation, I had manuscripts ready for specialty and general medical journals, as well as a presentation for the National Institute of Health and American Psychiatric Association Annual Meeting—all on different topics."*
>
> ***– LT Miguel Alampay,***
> *Former NICoE student*

[3] *All patient, family and provider quotes have been taken directly from anonymous satisfaction surveys that are supplied to each upon completion of the NICoE program. All quotes are self-reported and names have removed to preserve the individual's identity.*

DEVELOPING AN INTERDISCPLINARY TREATMENT PLAN

Patients are referred to the NICoE when their treating provider identifies stalled recovery or lack of response to treatment for a TBI/PH condition. The NICoE experience begins with an intake meeting on the first day, where the service member meets with an interdisciplinary team of clinicians who collect a comprehensive patient history, perform a thorough clinical evaluation and develop patient-centered, individualized treatment goals.

In compliance with the Joint Commission's requirements for the care of patients, in FY14, the NICoE developed and instituted a formalized treatment plan that explicitly captures patients' short- and long-term program goals and notes treatment opportunities that can help relieve their symptoms. The end result of this evaluation is a goal-directed and feasible long-term treatment plan, which is updated by the NICoE providers regularly during the four weeks of the program and communicated to the home station provider upon the patient's discharge.

The Interdisciplinary Patient Treatment Plan, which is initiated upon admission and updated weekly into the patient's medical record, focuses on the patient's identified goals in the areas of behavioral health, cognition, pain, sleep and overall satisfaction with life. This gives the home station provider the opportunity to review their patient's progress while at the NICoE and fulfills the NICoE's commitment to enhance communication and provide a true continuum of care for those suffering from TBI/PH conditions. In an ongoing commitment to continued quality and process improvement, audits of the treatment plan documentation and inclusion in patients' records have consistently yielded compliance ratings of 95-100 percent.

By sequencing the patient's evaluation and care through the development of the treatment plan, providers are better able to target symptoms that are most disruptive to the patient's life, such as sleep, pain or headache disturbance, and develop goals and techniques to overcome these disruptions.

FIVE-YEAR STRATEGIC PLAN IMPACT

Translating clinical observations and discoveries into clinical recommendations

In FY14, the NICoE refined and standardized its clinical practices through the formalization of the NICoE treatment plan, which enhances the organization's ability to translate clinical findings and recommendations back to the home station providers.

> *"NICoE is helping me recover my authentic self, something that I had lost during seven deployments."*
>
> ***– NICoE Patient****

SAMPLE CLINICAL ENCOUNTERS OFFERED OVER THE 4-WEEK STAY

WEEK 1

INDIVIDUAL SESSIONS:

- *Interdisciplinary team intake*
- *Audiology Evaluation*
- *Family Therapy Evaluation*
- *Neurology/Sleep Evaluation*
- *Neuropsychology Interview 1*
- *Neuropsychology Interview 2*
- *Nutrition Evaluation*
- *Optometry Evaluation*
- *Psychiatry Evaluation*
- *Sleep Study*
- *Sleep Education*
- *Speech-Language Pathology Evaluation*
- *Team Coordinator Evaluation*
- *Assistive Technology Evaluation*
- *Medication Reconciliation/ Inventory*
- *Physical Therapy Evaluation*
- *Wellness Evaluation*

GROUP SESSIONS:

- *Relaxation Training*
- *Chronic Pain*
- *Creative Arts Therapy*
- *Intro to TBI*
- *Managing Triggers 1*
- *Sleep Education/Actigraphy*
- *Yoga*

WELLNESS ACTIVITIES:

- *Acupuncture*
- *Stress Profile*
- *Warrior Canine Connection*
- *Transition Planning*

WEEK 2

INDIVIDUAL SESSIONS:

- *Family Therapy Follow-Up*
- *Neurology/Sleep Follow-Up*
- *Neuropsych Testing 1*
- *Psychiatry Follow-up*
- *Physical Therapy Follow-Up*
- *Speech-Language Pathology Follow-up*
- *Team Coordinator Follow-Up*
- *Vestibular Evaluation*

GROUP SESSIONS:

- *Nutrition Practicum Group*
- *Breath & HeartMath*
- *Creative Arts Therapy*
- *Managing Triggers 2*
- *Supportive Counseling 1*
- *Stress Response & Your Body*
- *Yoga*

WELLNESS ACTIVITIES:

- *Biofeedback*
- *HeartMath*
- *Transition Planning*
- *Warrior Canine Connection*

WEEK 3

INDIVIDUAL SESSIONS:

- *Art Therapy Evaluation*
- *Family Therapy Follow-Up*
- *Imaging Review/Sleep*
- *Neuropsychology Follow-Up*
- *Physical Therapy Follow-Up*
- *Psychiatry Follow-Up*
- *Speech-Language Pathology Follow-Up*
- *Team Coordinator Follow-Up*

GROUP SESSIONS:

- *Cognitive Skills*
- *Music Therapy Group*
- *Psychological Health & Recovery*
- *Relationships & Intimacy*
- *Supportive Counseling 2*
- *Tinnitus Group*
- *Mind-Body Group 1*
- *Wellness Planning Group*
- *Writing Workshop*
- *Yoga (Optional)*

WELLNESS ACTIVITIES (OPTIONAL):

- *Acupuncture*
- *Biofeedback*
- *Transition Planning*
- *Warrior Canine Connections*

WEEK 4

INDIVIDUAL SESSIONS:

- *Physical Therapy Follow-Up*
- *Psychiatry Follow-Up*
- *Discharge Conference*
- *Pre-Discharge Meeting*
- *Medication Reconciliation*
- *Meet with Nurse Consultant*

GROUP SESSIONS:

- *Creative Arts Therapy*
- *Labyrinth Walk*
- *Supportive Counseling Group 3*

WELLNESS ACTIVITIES (OPTIONAL):

- *Stress Profile*
- *Transition Planning*
- *Warrior Canine Connection*

THE NICOE'S PERSONALIZED CARE

The NICoE's holistic healthcare program provides patients with access to integrative medicine therapies, such as acupuncture, biofeedback, nutrition and mind-body practices, that complement the conventional medical care found in most large healthcare institutions. The program introduces patients to a variety of modalities in their first week that focus on pain mitigation and prevention techniques. Following this, patients participate in group sessions, such as mind-body skills, and individual interventions, such as acupuncture.

Because the integrative healthcare modalities offered at the NICoE are not one-size-fits-all, patients are encouraged to experience as many of the modalities as they can before working with their NICoE providers to customize the remainder of their four-week program.

In FY14, the NICoE began offering a Treatment Preference Survey that allows patients to highlight their preferred methods of treatment, so when openings are available in their schedule, the NICoE providers can engage them in therapy that interests

NICoE
National Intrepid Center of Excellence

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SERVICE MEMBER PREFERENCE SHEET

Service Member Name _____

Date _____

Instructions: *When there are openings in your schedule will we try to fill your schedule with the activities below. Please check the* boxes *you are interested in trying. Please return this completed form to the Ms Jessica Myers.*

Acupuncture: Use of ancient points to correct your energy based on your symptoms (i.e. pain, anxiety, insomnia, etc).	
Art Therapy: Uses the creative process of art-making to improve and enhance your physical, mental and emotional well-being.	
Biofeedback: Helps you to learn to control how your body reacts to stress to reduce symptoms like pain and anxiety and to improve performance.	
Biofield Therapy: Bioenergy healings help clients to reduce stress and recover more quickly, with less pain, from illness, trauma and surgery.	
Chaplain: A Spiritual Assessment to further explore what makes your life meaningful.	
Family Therapy Sessions: Additional individual or family sessions with your family therapist	
Independent PT: Utilize your available time in the PT gym using the equipment of your choice or physical therapy program.	
Intimacy Assessment (individual or couple): Understanding the impact of mTBI and psychological health issues on intimacy and sexual functioning.	

Music Therapy: Relieves your stress, anxiety and depression, muscle tension and pain, agitation and restlessness, and self-expression and self-awareness through music.	
Nutrition: Provides initial skills, knowledge and practical applications related to food selection and nutrition plan.	
Scraping (gua sha): Traditional Asian healing practice which increases circulation, and decreases muscle tension and pain.	
Tobacco Cessation: Treatment services to aid in the process of quitting tobacco use. **Counseling** **Acupuncture** (Circle your preference) ****Quit Date:_____**	
Transition Planning: 1st Sgt Jamie Andries (USMC, ret.) will deliver information pertaining to veteran's benefits (i.e. Dept of Veterans Affairs, TRICARE, family caregiver program for spouses, etc).	
Warrior Canine Connection: Therapeutic service dog training program that harnesses the healing power of the human-animal bond.	
Other:	

them. This individualized and tailored level of care encourages patients to be active participants in their evaluation and treatment, helping them to build both an alliance and trust with the NICoE providers. These efforts are important in ensuring patients and their families remain engaged with the interdisciplinary team and in future care. Treatment doesn't end with the NICoE program—patients learn skills to continue on their trajectory of recovery that they can take back to their referring provider.

INTEGRATING THE FAMILY INTO THE HEALING PROCESS

The Family Program at the NICoE is designed to conduct assessments, provide personalized education and skills training, and connect patients and families with appropriate resources. By conducting focused assessments to meet families' needs, the NICoE hopes to establish a shared language, instill positive communication skills and set shared goals for each family, reflective of their service member's treatment plan.

To involve all members of the family in the healing and treatment processes, the NICoE program features a Spouses Group and offers family appointments with the NICoE's providers. The Spouses Group is an informal support group that provides a nurturing, listening environment for the NICoE spouses to share common experiences, collaboratively solve problems and receive emotional and spiritual support in their journey as caregivers. NICoE providers may join the group to offer insight and answers to spouses' questions and concerns. Families can also make individual appointments with NICoE providers to include art therapy, nutrition planning and work with the service dogs.

In addition to these activities, family members also attend a series of educational modules designed to increase knowledge and awareness of patients' injuries and their impact on the family unit. Family and interpersonal relationships have a critical role in patients' well-being and recovery, and family strain is often symptomatic of TBI/PH conditions. The Family Program aims to improve communication between family members by addressing parenting, intimacy and interpersonal concerns and needs that can impact any family going through this healing process.

> *"[We are] so grateful for the kindness and caring shown to both of us. I'll leave feeling prepared, positive and hopeful for the change that is yet to come."*
>
> ***– NICoE Patient Family Member***

TRACK 1	TRACK 2	TRACK 3
Families who are unable to come to NICoE	Families at NICoE full program (4 weeks)	Families at NICoE for less than full program
+ Conduct pre-NICoE Family Assessment + Check-in with family once a week by phone or email to provide and educate families + Collaborate with local therapist regarding family and service member needs + Share family notebook as well as pertinent local resources	+ Conduct pre-NICoE Family Assessment + Invite family to join orientation, group sessions and appropriate service member classes beginning in week 1 + Weekly sessions with NICoE social worker + Collaborate with local therapist regarding family and service member needs + Share Family notebook including base and local resources	+ Conduct pre-NICoE Family Assessment + Check-in with family once a week to provide updates and educate + Weekly sessions with NICoE social worker during time at NICoE + Collaborate with local therapist regarding family and service member needs + Share family notebook including base and local resources

NICoE providers set shared goals for families, associated with the patient's treatment plan, and provide connections to appropriate family resources at their home station. The NICoE also issues the Family Program Survey upon completion of the program so families can share their satisfaction with their experience. The NICoE families have reported an 82 percent overall satisfaction rate with the NICoE program.

Several major collaborations occurred for the NICoE Family Program in FY14. In concert with University of California Los Angeles's Families OverComing Under Stress (FOCUS) program, the NICoE began using the Web-based Family Management System in April to contact patients and family members prior to their arrival and gather self-report survey data before their admission.

The NICoE also collaborated with the WRNMMC Sexual Health and Intimacy working group to implement educational offerings and couples intimacy assessments for patients and their spouses during their stay at the NICoE. The team of Licensed Clinical Social Workers (LCSW) who interact closely with patients and their families throughout their course of care identified the need for a more formalized program that would help service members understand the impact of TBI/PH symptoms on their intimacy and sexual functioning. Since the NICoE's LCSWs began this collaborative program approximately 20 percent of all service members seen at the NICoE have requested individual or couple intimacy assessments. Those who participated in the assessment have shared their appreciation for the NICoE staff who candidly and professionally addressed a topic that is oftentimes overlooked in a traditional medical model of care.

> *"I can't say enough about how impressed I am with the quality of care that's been provided to my husband. You all are serving a critical need for our military personnel. It's evident that each of you understands the importance of your role at the NICoE and that you take it very seriously. Thank you again for such a unique and wonderful experience."*
>
> ***– NICoE Patient Family Member***

PATIENT SATISFACTION MEASURES

To ensure the NICoE is regularly improving upon the needs and treatment goals of both the patients and their families, the NICoE asks patients to fill out the Patient Satisfaction Survey upon completion of the program. This survey helps the organization track therapies and programs that patients find to be effective and beneficial to their overall recovery and long-term treatment.

For example, based on the Patient Satisfaction Survey data collected in FY14, the NICoE providers know that three of the five most frequently referenced treatments and interventions that patients look forward to continuing upon discharge—yoga, acupuncture and mind-body skills—come from the integrative healthcare program. The NICoE has found that patients who take advantage of integrative healthcare have noted that they:

- Have more control of their pain
- Are able to decrease or stop their medications
- Are less anxious, less irritable, more relaxed and sleep better
- Exhibit better interpersonal skills

FIVE-YEAR STRATEGIC PLAN IMPACT

Translating clinical observations and discoveries into clinical recommendations

In FY14, the NICoE continued to collect satisfaction data from patients and their families to learn more about their experiences with each of the clinical modalities offered at the NICoE. This information can be used to help make clinical recommendations down the line and to further tailor the NICoE clinical program in the future. For example, continued endorsement of the acupuncture program at the NICoE by our patient population has demonstrated the need to offer integrative medicine throughout the MHS.

FY14 PATIENT SATISFACTION **SURVEY FINDINGS:**

96.3%

PATIENTS REPORTED FEELING MORE HOPEFUL AFTER COMING TO THE NICOE

96.3%

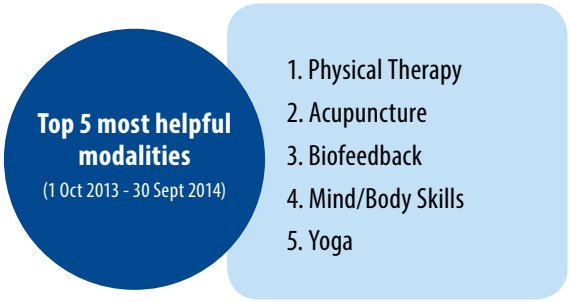
PATIENTS AGREED THAT THEIR PROVIDERS DID EVERYTHING THEY COULD TO HELP WITH THEIR PAIN

91%

OVERALL PATIENT SATISFACTION (ENCOMPASSING THE FOLLOWING CATEGORIES: OVERALL EXPERIENCE, SELF-ADVOCACY, ADMISSION AND DISCHARGE, WAIT TIME AND APPOINTMENT SCHEDULE, EDUCATION, ENVIRONMENT, AND STAFF)

Information such as this helps the NICoE providers to tailor patients' treatment programs and make sure patients continue to have access to these beneficial programs.

In an effort to continue to improve upon this data, enhance the data collection process and focus on collecting more quantitative results, the NICoE revised this survey in FY14. This recent update has enabled the organization to measure and track patients' satisfaction based on five-point Likert scale measures, thereby capturing patients' attitudes and opinions on their NICoE experience. The NICoE issued the new survey to the October 2014 cohort, setting the stage for a more quantitative representation of the patients' overall satisfaction with the organization, which will allow for the NICoE to continue improving their program based on patient satisfaction and feedback.



NON-COHORT PATIENT SERVICES

Since its inception, making state-of-the-art technology available for patients has been a top priority for the NICoE. The NICoE's neuroimaging suite—3-tesla magnetic resonance imaging (MRI), positron emission tomography-computed tomography (PET/CT) and Magnetoencephalography (MEG)—boasts an array of technology that is uniquely available in one location.

Leveraging this impressive array of capabilities, in FY14, the NICoE expanded its access for service members who require the expertise of the NICoE personnel and modalities but not for the full four-week stay. These "non-cohort" options— selective options for patients not enrolled in the four-week program—allow MHS patients to receive targeted, diagnostic care using the NICoE's technology, facilities and personnel. This enables their providers to recommend treatment options similar to those provided to the NICoE's cohort using an abbreviated timeline. The NICoE supports these additional clinical demands, prioritizing TBI-related stresses over other clinical needs, to maximize efficient use of their personnel, space and equipment and to achieve mission success.

In FY14, the NICoE opened its doors to non-cohort patients from WRNMMC and began the process of integrating non-cohort patients into the NICoE's sleep studies program and the pain clinic initiative. The NICoE was able to more than double patient throughput from about 200 to 532 patients per year in FY14 by providing non-cohort offerings. This integration has been so successful that the NICoE plans to expand non-cohort services in the future and continue to share assets through programs like the Music Therapy Program, computer assisted rehabilitation environment (CAREN)/physical therapy, firearms training and nutritional offerings.

Sleep Studies

The NICoE Sleep Medicine Department treats various sleep disorders, focusing on sleep disordered breathing and insomnia. One-on-one appointments with a sleep specialist are provided to those in the four-week program and to those non-cohort patients who need a studied approach to address sleep disturbances. Every patient at the NICoE receives a complete diagnostic polysomnogram, which is used to diagnose and rule out many types of sleep disorders such as narcolepsy, idiopathic hypersomnia, periodic limb movement disorder, rapid eye movement behavior disorder, parasomnias and sleep apnea.

The NICoE has received and reviewed 113 consults in their sleep lab since they began seeing non-cohort sleep study patients in April 2014. By maximizing the excess capacity available in the NICoE sleep lab to conduct studies for patients from WRNMMC and Fort Belvoir Community Hospital, the NICoE assuaged leakage to the network and contributed to a MHS cost savings of approximately $41,000.

Pain Clinic

In addition to seeing NICoE patients, the NICoE evaluates and treats patients from WRNMMC and its surrounding areas, employing interdisciplinary mind-body approaches, such as acupuncture, biofeedback, meditation, movement, aquatic therapy and yoga, as adjuncts to more traditional approaches, such as pharmacologic management and interventions like epidural steroid injections and trigger point injections, to improve patients' functionality.

Since opening its doors to non-cohort patients, the NICoE's pain clinic has treated 216 patients in addition to those within the four-week NICoE program. Seeing this additional patient population takes some of the strain off of the providers at local MTFs and reduces patient leakage into the network.

> *"From the medical and research teams searching for answers to the many unanswered questions and new side effects surrounding traumatic brain injuries, to the clinical psychologists, music therapist, yoga therapists, art therapists, and physical therapists, all were working to develop innovative, personalized, and successful therapy methods. The name of the center—the National Intrepid Center of Excellence—was rightfully given. In the face of war and destruction, an immensely complex and relentless opponent, NICoE offered fearless courageousness, a safe haven for veterans and their families to breathe, to renew, to hope."*
>
> ***- Jackie Donovan,***
> *Former NICoE student*

Music Therapy

The NICoE Music Therapy Program uses music as a clinical intervention to address cognitive rehabilitation and psychological needs for service members with comorbid TBI/PH conditions. Their music therapist designed the program from the ground up, taking into account sensory, psychological and emotional needs of the NICoE's patients. The Music Therapy Program uses methods of listening and improvising to explore conceptual and somatic socio behavioral correlations of the mind and body, self and others, and individual and societal integration.

The NICoE's music therapist is a shared asset with WRNMMC. In FY14, the music therapist had an outpatient total of 213 WRNMMC encounters, 305 NICoE encounters and 270 inpatient encounters. The growing Music Therapy Program collaborates with WRNMMC Gait Lab, Hearing Center of Excellence, Child & Adolescent Behavioral Health Clinic, and Inpatient TBI Rehabilitation Ward for patient treatment and research. A case study on music therapy in the Inpatient TBI Rehab Ward (7E) was presented in a poster at the May 2014 American Psychiatric Association Annual Meeting.

Computer Assisted Rehabilitation Environment and Physical Therapy

The NICoE's CAREN allows physical therapists to incorporate advanced virtual reality technology of non-combat scenarios into the evaluation and treatment of the NICoE patients. This system allows providers to examine motion sensitivity, gait, balance, cognition and/or visual scanning tasks in a safe, systematic way. The information gathered helps patients' physical therapists address impairments and implement compensation strategies.

In FY14, the NICoE established a process to accept a limited number of CAREN referrals for non-cohort patients from the Intrepid Spirit at Fort Belvoir.

> *"The essence of music is a deep form of communication. You have these sounds, but they reflect something that someone is crying out to say and to express."*
>
> ***– Yo-Yo Ma,***
> *speaking in a CBS special about making music with wounded warriors in the NICoE's Central Park*

INTEGRATING THE HOME STATION PROVIDER

The NICoE is dedicated to supporting the TBI/PH patient population's entire continuum of care, from intake to evaluation, treatment planning, discharge and follow-up. Partnering with MTFs across the country begins prior to admission and culminates in a common goal, ensuring a successful transition and discharge plan is provided for each patient.

The NICoE realizes that integration with home station providers is a fundamental component of a patient receiving coordinated and comprehensive care. The NICoE collaborated with the Defense Centers of Excellence (DCoE) and the RAND National Defense Research Institute on evaluating the NICoE program from the perspective of the patients and referring providers. Preliminary results indicated that patients continued to be very satisfied with their NICoE experiences, but concerns with provider engagement reinforced the NICoE's actions to communicate more frequently with home station providers in a more effective manner.

With this in mind, the organization developed initiatives in FY14 to increase connectivity with the home station providers throughout the course of the patient's stay at the NICoE, not just upon discharge. In an effort to garner greater customer feedback and identify opportunities to evaluate and improve the four-week program, the NICoE developed and deployed a Web-based survey for referring providers utilizing Survey Monkey. This format assures respondent anonymity and provides a simple means of expeditiously acquiring valued information.

Preliminary results of this survey indicated that referring providers, on average, rated the NICoE a 4 out of 5 on a Likert Scale (5 indicating "strongly agree") in the areas of the effectiveness and efficiency of the referral process, usefulness of discharge documentation, and overall benefit of the NICoE program to their patients.

Additional comments offered by referring providers on this survey include: "You are the model program for a unique patient population that poses many complicated medical and psychological conditions 'multi-factorial' which in my opinion could not be tackled by a non-team approach"; and "Excellent customer service from beginning to end. As a provider, I felt included in the NICoE team which was helpful for the soldier as he transitioned back to 'life'. He was able to return to his home providers with confidence that he would not lose everything he gained while away. Kudos to the wonderful staff."

The NICoE nurse case managers (NCM) play a pivotal role in ensuring coordination of care with the home station providers beginning on the day the patient arrives at the NICoE. Beginning in FY14, the NICoE case managers began sending welcome emails to the referring providers indicating to them that additional information could be found in the patient's record regarding his/her assigned interdisciplinary team. On the patient's first day at the NICoE, the NCMs initiate an entry in the patient's medical record which includes a complete listing of the names of the NICoE interdisciplinary treatment team members and their associated disciplines, as well as the anticipated date and time of the patient's discharge conference.

In response to referring provider feedback, two additional initiatives were identified to assist referring providers with their patient's continuity of care following discharge from the NICoE program. The NICoE discharge summary was redesigned in FY14 to provide a concise document with discharge diagnoses and recommendations for follow-up, thus shortening the document from an average length of 25-30 pages to a more succinct three to four page synopsis of their care. This streamlined document provides the provider with a comprehensive summary of the patient's NICoE stay with a quick reference to discharge diagnoses and follow-up recommendations to guide the patient's continued care at the home station.

The second was the initiation of an improved medication tracker system form used during the NICoE program. This system enables NICoE providers to track new, updated and discontinued medications throughout the four-week program and to provide the patient with an updated medication sheet each day. The final discharge medication list is uploaded into the patient's medical record to provide the home station provider with a document outlining the final discharge medication list and a summary of changes that were made to the patient's medical regime throughout the program.

FIVE-YEAR STRATEGIC PLAN IMPACT

Effectively communicating the NICoE's distinct mission

In FY14, the NICoE strived to integrate home station providers into the organization's continuum of care, improving communication and ensuring the NICoE's mission, goals and value were understood at the MTF level.

> *"I have referred numerous patients and have personally visited your state of the art medical facility on two occasions. I have to say your team is decades ahead of its time. The instant feedback and acknowledgement to these complex patients either rehabilitates a Service Member or gives him the treatment and tools needed to rebuild. The facility also gives the patients sanctuary to escape and focus on the rebuilding process."*
>
> ***– NICoE Referring Provider***

Referral Sources by Service

Marines	Army	Navy	Air Force	Coast Guard
Camp Lejeune, NC	CBWTU-AR	SOCOM	SOCOM	USCG Traverse City
Quantico, VA	SOCOM	NNMC Bethesda	Eglin AFB, FL	HSD
WRNMMC Bethesda	Fort Hood, TX	Patuxent River, MD	Dover AFB, DE	
NNMC Bethesda	Fort Campbell, KY	Camp Lejeune, NC	Peterson AFB, CO	
Camp Pendleton, CA	Fort Huachuca, AZ	Virginia Beach, VA	Pope Field, NC	
SOCOM	Fort Riley, KS	WRNMMC Bethesda	Tyndall AFB, FL	
Cherry Point, NC	WRAMC	Fort Belvoir, VA	WRNMMC Bethesda	
Fort Belvoir, VA	Fort Meade, MD	Naples, Italy	Fairchild AFB, WA	
Parris Island, SC	Fort Drum, NY	Quantico, VA	Newport, RI	
Indianhead, MD	Fort Bliss, TX	Naval Branch Health Clinic Groton, CT	WRAMC	

The chart above reflects the top 10 referring installations by service.

CLINICAL ACCOMPLISHMENTS AT A GLANCE

In FY14, the NICoE:

- Developed an Interdisciplinary Patient Treatment Plan that captures patients' short- and long-term program goals and records possible treatment avenues in accordance with Joint Commission requirements. In an ongoing commitment to continued quality and process improvement, audits of the treatment plan documentation and inclusion in patients' records have consistently yielded compliance ratings of 95-100 percent
- Began administering a Treatment Preference Survey that allows patients to identify their preferred methods of treatment which are effective while at the NICoE and can be transferred back to the home station providers. The survey was revised to focus on collecting more quantitative results, incorporating Likert scale measures
- Received an 82 percent overall satisfaction rate with the NICoE program from families when surveyed upon completion of the program
- Started using the Web-based Family Management System for the NICoE Family Program to gather self-report data in concert with the University of California Los Angeles's FOCUS program
- Collaborated with WRNMMC's Sexual Health and Intimacy group to provide intimacy assessments and education for patients and their spouses
- Expanded its program offerings to include a non-cohort option to allow more service members to utilize the NICoE's resources and capabilities for a truncated time period
- Developed initiatives to increase connectivity with the home station providers throughout the course of the patient's stay at the NICoE, not just upon discharge, and garnered greater customer feedback and identified opportunities to evaluate and improve the four-week program through the development and deployment of a Web-based survey for referring providers utilizing Survey Monkey
- Redesigned the NICoE discharge summary to provide a concise document with discharge diagnoses and recommendations for follow-up, thus shortening the document from an original average length of 25-30 pages to a more succinct three to four page synopsis of their care

In FY14, the NICoE program was nominated by the United States Special Operations Command community for the Military Officers Association of America Community Heroes Award.

The nomination recognized the NICoE for being "vital to the Preservation of the Force and Family initiatives for the Special Operation Forces community. They understand our mission, warrior ethos and yes, even our occasional resistance in seeking medical attention."

"Due to NICoE's critical contribution, the life cycle of the operator, now extended thanks to the timely, well-targeted interventions, includes an understanding and acceptance of 'taking a knee' for a month in order to address what frequently has been years of injury-in-the-making. They have gained our complete trust and confidence in healing our community of heroes and we are grateful they are our dedicated partners in this endeavor."

V. MAKING THE INVISIBLE WOUNDS VISIBLE

The mission of the NICoE's Research Department is to facilitate an interdisciplinary, collaborative environment that promotes the value of clinical research and fosters the translation of scientific discovery to the community. The NICoE collaborates with academic partners and associates at the Uniformed Services University of the Health Sciences (USU), Walter Reed Army Institute of Research (WRAIR), Naval Medical Research Center and National Institutes of Health to leverage the NICoE's unique patient population and technical and clinical resources to initiate innovative pilot studies designed to advance evaluation and treatment of patients with TBI, including those who also suffer from PH conditions.

With the mission of refining the diagnosis, treatment and prognosis of TBI/PH, the NICoE's research agenda targets three goals directly in line with the White House's National Research Action Plan. These goals are:

1. Identifying the combination of disease states that occur in the TBI/PH population
2. Discovering relevant biomarkers that are associated with diagnosis and prognosis in the TBI/PH population
3. Determining paradigms that predict recovery versus biological and psychosocial disintegration

> *"The NICoE was great. It helped me realize that I wasn't alone and that others are also in pain or suffering. It also let me see what others are dealing with and their coping strategies and just their experiences in general."*
>
> ***– NICoE Patient***

INFORMATICS AND LONGITUDINAL DATA AT THE NICOE

During FY14, the NICoE completed the initial release of the NICoE Continuity Management Tool (NCMT), a cutting-edge, large-scale informatics database that supports the collection, standardization and analysis of TBI clinical data. The NCMT project leverages multiple existing Defense Health Agency (DHA) Health IT assets to produce a cost-effective database system capable of collecting millions of clinical data points from various data sources.

The NICoE has also been working closely with USU to develop policies and procedures that will allow the input of clinical research data into the Center for Neuroscience and Regenerative Medicine's (CNRM) database. CNRM's data can be shared with the Federal Interagency Traumatic Brain Injury Research database and used by scientists and researchers across the country to accelerate discovery in the TBI/PH realm. This collaborative process of collecting data will produce a comprehensive database that will allow for external query and analysis.

FIVE-YEAR STRATEGIC PLAN IMPACT
Strengthening infrastructure and processes
In FY14, the NICoE formalized and streamlined the way they collected outcome data from patients through the NICoE Continuity Management Tool and Wounded III and Injured Registry. These two IT systems strengthened the organization's data collection infrastructure and aligned well with the NICoE's long-term research goals.
Research collaborations and information sharing
In FY14, the NICoE advanced informatics that integrate with the Center for Neuroscience and Regenerative Medicine and the Federal Interagency Traumatic Brain Injury Research database in an effort to continue to collaborate with academic partners and associates and share key data on TBI/PH conditions.

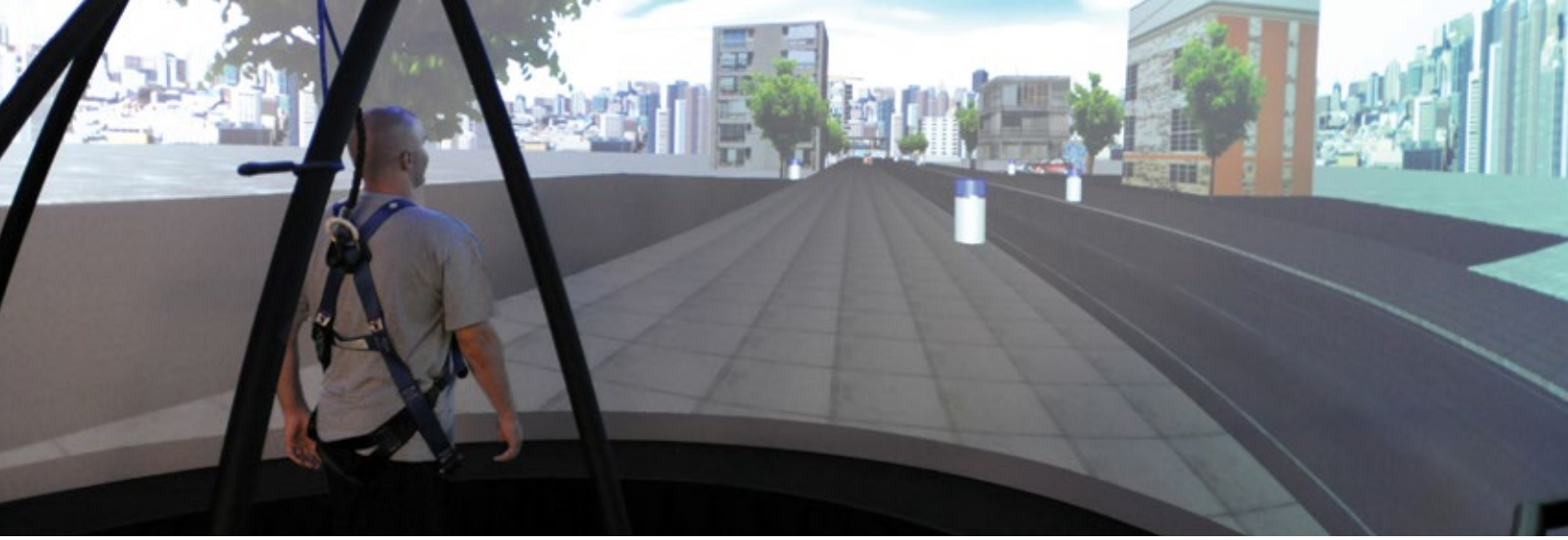
As part of the NCMT effort, the NICoE created a module within the Naval Center for Combat and Operational Stress Control's (NCCOSC) Wounded Ill and Injured Registry (WIIR) system to collect follow-up scales and data from service members who have been treated at the NICoE. The transition from pen and paper to computer-based entry offers a more efficient process for patients and staff, decreases transcription errors and provides a central repository where results may be reviewed.

The launch of the WIIR in June 2014 made it easier for the NICoE to pull reports and track longitudinal outcomes from patients once they have left the NICoE program. Built into the WIIR is a system that periodically sends emails to patients post-NICoE asking them to complete the follow-up scales to assess sustainability and longevity of the NICoE program in their healing process. Since the longitudinal surveys launched, the NICoE has experienced a 40 percent compliance rate from patients and has had the opportunity to partner with the Defense and Veterans Brain Injury Center (DVBIC) and the Intrepid Spirits, who also plan to use the WIIR to collect this important data. The NICoE's customization of the WIIR produced a system solution for long-term follow-up of patients, not only from the NICoE, but from other organizations who also use the WIIR for data collection purposes.

The NCMT model has generated significant interest in the Department of Defense (DoD) and has been noted as the model on which to implement IT solutions; the Hearing Center of Excellence and the Extremity Trauma and Amputation Center of Excellence are following the NCMT model to design and develop their own registries.

In October 2014, the NICoE was one of 10 public sector IT projects recognized at the annual Government Computer News gala for excellence in "Big Data" IT innovation and teamwork. The NCMT project was selected among hundreds of other projects from different Federal, State, and local agencies. The NCMT won this prestigious award for their use of existing software and hardware, along with collaboration with clinicians and researchers, to collect more than 46,000 data points per patient.

> *"The Office of the Assistant Secretary of Defense for Health Affairs (OSD HA) is working to ensure maximum benefit for the MHS from the work being done in our Centers of Excellence. One area for improvement is the sharing of data from the general electronic medical record activity and the communities of interest managing special sets of data. It is a challenge to ensure all required documentation makes it to a patient's medical record while at the same time supporting special data needs. The NCMT provides one of the best examples to date to meet this challenge. By using the EMR as the primary means of entry, and developing a data mart in collaboration with the enterprise data warehouse, the medical record is complete, the NCMT has access to the data it needs, and the entire MHS can benefit from some of the specialized data developed. NICoE should be proud of this achievement and we encourage other Centers of Excellence to learn from and follow their example."*
>
> ***– COL John Scott,***
> *Director of Clinical Informatics Policy, OSD HA*



CONTINUING TO SET THE STANDARD FOR IMAGING RESEARCH

The NICoE employs state-of-the-art diagnostic imaging modalities, including MRI, functional (f) MRI, diffusion tensor imaging (DTI), MRI spectroscopy, and PET/CT to detect central nervous system structural and functional deficits that occur in this patient population. The overall goal of the NICoE's imaging research is to be able to identify objective biomarkers of TBI through a combination of information from multiple image modalities. Much work also goes into both capturing and analyzing these images in order to optimize the mechanics of image processing. The NICoE's scanners are designed to provide detailed and complementary information about anatomical and functional irregularities in the brain.

Neuroimaging and radiology data require careful attention to how it is stored, archived, analyzed and made available to researchers and collaborators. With this in mind, the NICoE developed an automated process for error correction of raw imaging data in FY14. This automated process helps the NICoE researchers remove artifacts from the images, such as bone shadows, movements and metallic fragments, which often obscure the sensitive ability to detect abnormalities in these images.

The NICoE's imaging data was put through this automated process over an eight-month period in FY14 (January— September) using approximately 10 imaging personnel and 11 imaging modalities: MRI T1, T2, T2*, DTI, anatomy/FreeSurfer, susceptibility weighted imagining, perfusion, fMRI resting state, fMRI memory task, fMRI executive function task and PET fludeoxyglucose.

At the end of this extensive automated process, the NICoE is left with a large, uniform data set that can be confidently used for data analysis. For example, someone who is not a DTI expert can utilize the approved results without having to know the many, minute details about potential problems with data processing. This permits a large pool of researchers to use and combine the data across modalities in innovative ways. With this process, the NICoE is advancing the science of how imaging researchers acquire data on the TBI/PH patient population.

FIVE-YEAR STRATEGIC PLAN IMPACT

Strengthening infrastructure and processes

In FY14, the NICoE developed a comprehensive and robust automated process that streamlined the NICoE's process for analyzing and categorizing imaging data. This process allows the organization to conduct more effective and accurate data analysis in line with their research agenda.

ESTABLISHING A TBI SCIENTIFIC REVIEW COMMITTEE

In FY14, the NICoE Research Department established a scientific review committee that focuses exclusively on TBI/PH conditions. This committee of subject matter experts from the NICoE, USU, WRNMMC, WRAIR and other applicable institutions came together to ensure the NICoE's research projects have scientific rigor and integrity to make substantially relevant contributions to the MHS and scientific communities.

By developing a review committee of this nature, the NICoE has encouraged all researchers and providers in their facility to work together to develop state-of-the science protocols that have been reviewed and approved by their peers.

Due to the development of review committees such as this, the NICoE was able to exponentially increase their output of presentations, posters and publications. FY14 was the NICoE's most successful year to date as the organization was asked to offer

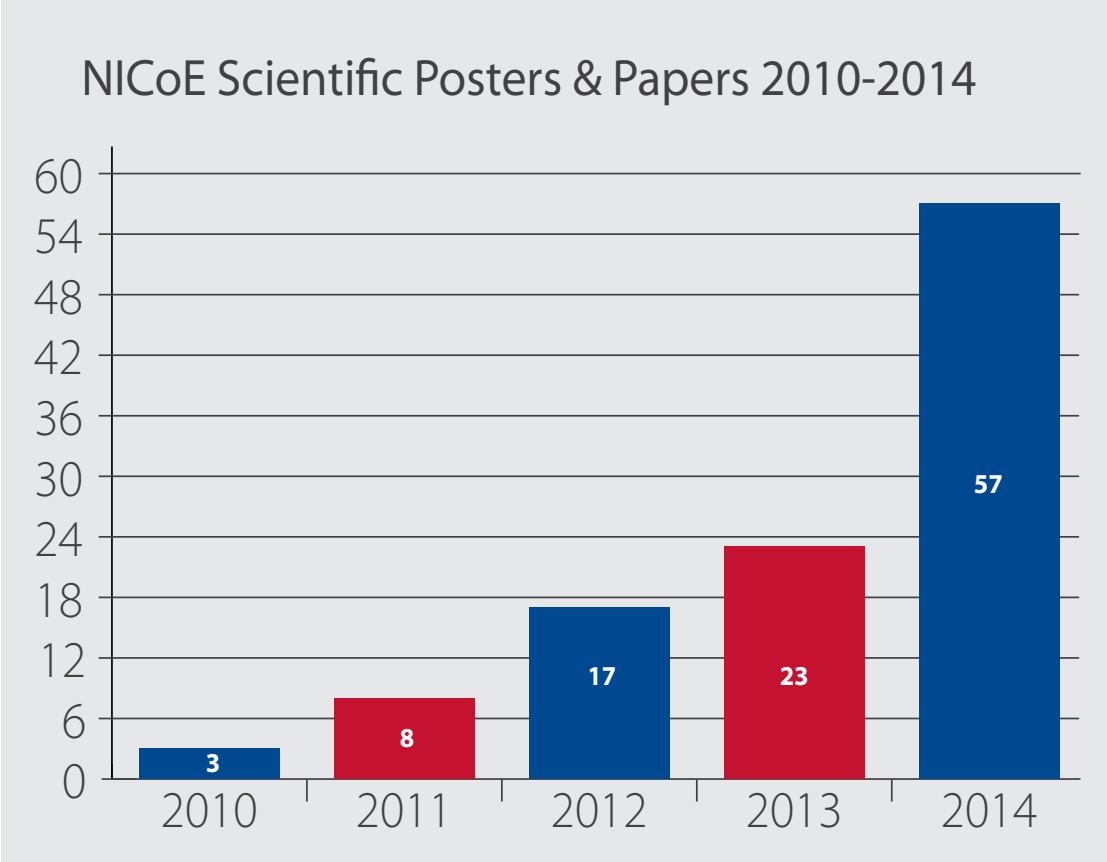
FIVE-YEAR STRATEGIC PLAN IMPACT

Research collaborations and information sharing

In FY14, the development of the Scientific Review Committee helped the NICoE collaborate with academic partners and associates to develop state-of-the-science protocols and research initiatives.

26 lectures and presentations at various conferences and professional gatherings nationwide, developed and presented 42 posters, and published 15 journal articles.

The NICoE presented posters and findings at five national scientific conferences and had a presence, via staff offering poster presentations, lectures or speeches, at every major conference associated with TBI in the country.



FY14 DATE	NAME OF CONFERENCE/EVENT	NUMBER OF NICOE POSTERS
January 2014	NCA TBI Research Symposium	18
	International Society of Magnetic Resonance in Medicine Conference	2
	American Association for Applied Psychophysiology and Biofeedback Conference	3
March 2014	10th World Congress on Brain Injury - International Brain Injury Association	1
April 2014	American Academy of Neurology Conference	2
	USU Amygdala Conference	2
May 2014	22nd Annual USPHS Nurse Recognition Day	1
	American Psychiatric Association Convention	4
June/July 2014	National Neurotrauma Symposium	4
August 2014	Military Health System Research Symposium	3
September 2014	DCoE Summit	
October 2014	Annual Neurological Association Conference	2
TOTAL		42

For a full list of all journal articles, posters, and lectures that the NICoE published or presenting in FY14, please refer to the addendum.

GRANT FUNDING AND IMPROVED FINDINGS

Through more effective utilization of both personnel and infrastructure, the NICoE was able to facilitate enhanced grant execution in FY14. This development allowed the NICoE to expand their partnerships, launch new and innovative research protocols, and advance the state of the science for TBI/PH research.

In FY14, approximately $4.5 million was executed for the NICoE research grants. The breakdown and resulting research is as follows:

NICOE RESEARCH GRANTS

HBO2
$500,000

Brain injury and mechanisms of action of hyperbaric oxygen for persistent post-concussive symptoms after mild traumatic brain injury (BIMA)

The HBO2 project is a multi-site, multi-year project. The purpose of this study is to collect information about brain function and structure among active duty military personnel who have had a concussion and continue to experience symptoms at least three months after injury. NICoE's role is to perform the analysis for the medical imaging arm of the study. Subject enrollment closed in July 2014, with enrollment of healthy controls still ongoing. Analysis of the pre-treatment data has just commenced, so no results are currently available.

Team TBI
$599,000

The TEAM-TBI project is designed to create a transformative approach for assessment of TBI and to provide self-help strategies that war-wounded would be able to administer independently

The project entails a multi-institute clinical trial in which subjects will undergo a comprehensive 3-day intake evaluation, a variety of remotely performed tasks based on the intake evaluation, telemonitoring and telemedicine modalities, and a six-month in-person follow-up. As part of the initial and follow-up (6-month) evaluation, subjects will have advanced MRI scanning aimed at providing qualitative and quantitative assessments of the nature, location, and extent of brain injury. MRI sequences will include high-definition fiber tracking on a 3-Tesla (3T) machine, as well as standard clinical sequences.

Genomics
$150,000

Research Protocol Title: Genomic Determinants Patterns Pre and Post NICoE Skills Based Training: Measuring the Relaxation Response in Service Members with PTSD and TBI

In collaboration with researchers at Harvard Medical School, Benson-Henry Institute, and Beth Israel Deaconess Medical Center Genomics Center, NICoE researchers use multimodal assessment and outcome metrics to identify quantifiable, biological/physiological determinants of responsiveness to the four-week IOP. Central to assessment is genomic expression analysis to characterize the comorbid state on admission, and correlate changes in genomic markers with clinical response. Further analysis will compare clinical response with specific electrophysiological and neural network patterns measured by MEG, autonomic changes measured by heart rate variability with Actiheart, and cerebral vasoreactivity measured by Transcranial Doppler.

NICOE RESEARCH GRANTS (CONT.)

TMS
$361,358

A Study of bilateral prefrontal Transcranial Magnetic Stimulation (TMS) to treat the symptoms of mild TBI (mTBI) and PTSD
This work is a collaboration with investigators at USU and WRNMMC that is funded within the Center for Neuroscience and Regenerative Medicine. The purpose of this study is to investigate the efficacy and tolerability of TMS to enhance the rehabilitation of service members with symptoms consistent with mTBI with comorbid PTSD symptoms. Additionally, exploratory work will be done to look at the neuronal and biological changes that may occur over the course of TMS treatment. The overall objective of this project correlates the efficacy and tolerability of TMS for mTBI with PTSD symptoms and treatment response with anatomical and biological factors unique to each service member (SM).

Connectome
$730,000

Multi-modal connectome analysis of traumatic brain injury neuroimage data
One of the challenges of mTBI is the lack of sensitive and specific diagnostic measures. The purpose of this project is to identify clinically relevant biomarkers as diagnostic and prognostic indicators of military-related TBI by integrating multimodal neuroimaging and neurobehavioral measures. Through the use of existing technologies, information will be combined from multiple independent neuroimaging tests to characterize TBI in relation to a host of clinical observations and provide a useful diagnosis for an individual who has experienced a TBI. The major activities to date have focused on laying groundwork analysis, which includes systems development, personnel hires, equipment purchases, laboratory space development, and development of image analysis procedures. We are currently in the process of purchasing computer equipment required to support this project.

Hypoxia
$522,000

Potential Utility of Sleep and Hypoxia Evaluations for Assessment of mTBI Patients
Subtle, long-term mTBI-related deficits may be minimized under unstressed "normal" day-to-day circumstances of adequate sleep, and normal availability of oxygen. However, stressors are common in military performance (sleep-deprivation, hypoxia due to altitude and unpressurized air flight). This study explores whether stressors have disproportionate negative effects on persons with mTBI.

Findings indicate that persons with mTBI may appear normal when examined under low stress, such as during a clinical examination at low or moderate altitude, but may exhibit worrisome cognitive deficits when exposed to relatively mild and common stressors (e.g. 12,000 foot altitude is where Service Members fight, and skiers routinely reach that altitude - the top of the ski lift at Arapahoe Basin is 12,997 feet).

NICoE Network Research Program (NNRP)
$1.2 million

The National Intrepid Center of Excellence Clinical Research Database to Study the Natural History of Traumatic Brain Injury and Psychological Health Outcomes in Military Personnel
The primary objective of the NNRP project is to convert clinical information obtained from individuals evaluated and treated at the NICoE into a database with multiple dashboards that will facilitate research, clinical, and administrative evaluation. Key uses of this database will be the study of the natural history of TBI/PH issues in service members, the examination of trends of these conditions over time, determining the effectiveness of various treatments, the measurement of the availability and efficacy of services in the Military Health System, and the generation of new questions for future research on TBI and psychological health conditions. Collectively, this will entail the creation of a data registry with millions of data points, built-in applications to enable ongoing data collection from disparate sources, computational infrastructure and the development of a virtual layer interface between the end user and the source data.

Neuroimaging Core
$1.6 million

National capital consortium TBI neuroimaging core project
Neuroimaging is the primary objective measure of TBI, yet large gaps of knowledge still exist regarding imaging findings, traumatic brain injury and clinical outcomes. The purpose of this study is to close the gaps and develop a state of the art center for imaging TBI. The major activities of this project have focused on protocol development, regulatory affairs, personnel hires, equipment purchases, laboratory space development, data acquisition and development of image analysis procedures. Advanced neuroimaging data has been acquired on over 900 TBI subjects and 50 controls. We have found that the clinical MRI and PET scanners can provide a comprehensive set of neuroimages that allows for a superior diagnosis of TBI compared to CT or standard MRI radiological images. The methods developed for this project were adopted by the DCoE, DVBIC, and VA for the development of CPG for imaging of TBI in the military. The advanced MRI scans can be acquired in under 2 hours and is well tolerated by >99% of mTBI patients. Single subject analysis for TBI can be accomplished by comparing each subject's scans from a series of modalities to population-average templates created from healthy control subjects' scans for each modality. Statistically meaningful measures can be made regarding the likelihood that observed anomalies within each scan differ significantly from a healthy control population. It was also discovered that the most common brain lesion in patients with mTBI are punctuate T2 hyperintense regions.

Due to the grants above and additional partnerships and collaborations, the NICoE has made headway in discovering and exploring new research findings in FY14, such as:

- MEG provides real-time assessment of neurologic function and stimulus processing. Through analysis of data collected to date, we have defined a previously undescribed neural pathway involved in visual sensory processing. This pathway behaves differently in patients suffering from PTSD and who also described difficulties with memory. This could represent a potential biomarker for PTSD and comorbid memory difficulties, and it suggests several hypotheses about the mechanism of action of these symptoms and potential treatments to correct the underlying dysfunction
- The NICoE uses the Transcranial Doppler with breath holding to measure cerebral vascular reactivity. Through the use of this modality the NICoE found that abnormalities of this breath hold index are associated with PTSD symptom severity. This potential biomarker for PTSD suggests dysfunction of the autonomic nervous system is central to symptomatology in many of these patients. This finding adds objective description for a disease state that has historically relied on subjective reporting of symptoms
- The Neuropsychological Symptom Inventory (NSI) is a measure of symptomatology in the TBI population. The NICoE found a subset of patients who have symptoms that are best attributed to post-concussive syndrome rather than being accounted for by PH conditions. This is in contrast to previously published literature that described morbidity of the mTBI population being due to mental health conditions. These findings add weight to the argument that subclassification of the mTBI/PH population is needed to best target treatment modalities and predict long-term prognosis
- DCoE recommended the NSI be used to monitor symptom severity in the mTBI population. They specifically identified a lack of standardization in both scoring techniques and repeat administration over time. The NICoE confirmed that current methods of scoring are valid regardless of which modality is used. The NICoE also showed that the NSI can be given at various points in time to demonstrate changes in symptom severity
- The NICoE collected a variety of standardized rating scales on over 400 patients and showed significant decreases in symptom severity across a variety of neurological and behavioral health parameters during the patients' NICoE stay. These findings demonstrate objective evidence of efficacy of the NICoE program for a patient population that has failed to respond to previous medical interventions. These valid metrics demonstrate program effectiveness and are consistent with recommendations from the Institute of Medicine's report on PTSD care within the DoD and United States Department of Veterans Affairs (VA) systems
- The NICoE found that invalidation of neuropsychological testing did not obscure improvements in self-report symptom scales. Invalidation of testing can occur in up to 50% of patients but does not exclude use of the data to assess symptom response to treatment

DEVELOPING AND EXPANDING RESEARCH COLLABORATIONS

In FY14, the NICoE expanded upon its key existing partnerships to further its mission in understanding and treating comorbid TBI/PH conditions:

FIVE-YEAR STRATEGIC PLAN IMPACT
Research collaborations and information sharing
In FY14, the NICoE continued to foster research collaborations and information sharing with key organizations and Intrepid Spirits, as well as collaborations, partnerships and protocols with key affiliates, including 12 federal and six academic partners.

GOVERNMENT AND MILITARY PARTNERS	DESCRIPTION
Center for Neuroscience and Regenerative Medicine	Working together on investigator-initiated research projects and database management for clinical research studies
Uniformed Services University of the Health Sciences	Collaboration exists through multiple studies exploring exposure-based therapy and treatment for PTSD, autonomic assessment and physiological assessment with patient with PTSD, PH outcomes, intimacy and family interactions, canine assisted therapy efficacy and biomarkers, and Transcranial Magnetic Stimulation PTSD study
Defense and Veterans Brain Injury Center	Working together to develop a mechanism to collect and track longitudinal outcomes in the NICoE patients by using Regional Care Coordinators to reduce redundancies and enhance efficiencies in collecting this data; monthly teleconferences with DVBIC and partners to provide updates
The Walter Reed Army Institute of Research (WRAIR)	The NICoE MEG director is a part-time asset from WRAIR
Naval Medical Research Center	Collaboration on MEG research

ACADEMIC PARTNERS	DESCRIPTION
Drexel University	Seeking funding and developing protocols for music and art therapy
Harvard University	Study evaluating the relationship of genomic expression with integrative medicine
The National Endowment of the Arts	Memorandum of Understanding to support Operation Homecoming, a writing workshop for wounded warriors (the memorandum expanded to support music therapy or WRNMMC)
The University of Pittsburgh	Serving as a pilot site for the TEAM-TBI project led by the University of Pittsburgh focused on new cutting-edge imaging modalities
The University of North Carolina	Autonomic assessment and canine assisted therapy efficacy and biomarkers
University of Colorado	Collaborating on the HBO2 study with both institutions
University of Utah	Collaborating on the HBO2 study with both institutions

RESEARCH ACCOMPLISHMENTS AT A GLANCE

- Had its most successful year yet, with nine requests for presentations, production of 42 posters, 15 published journal articles, posters and findings presented at five national scientific conferences, and a presence at every major TBI-related conference in the country
- Developed and launched the NCMT to improve the collection, standardization and analysis of TBI clinical data. The NICoE was one of 10 public sector IT projects to win an award at the annual Government Computer News gala for excellence in "Big Data" IT innovation and teamwork
- Created a module within the NC COSC WIIR system to collect follow-up data from service members who have been treated at the NICoE to track their progress after leaving the program
- Developed an automated process for error correction of raw neuroimaging and neurology data
- Established a scientific review committee that focuses exclusively on TBI/PH conditions and ensures that the NICoE's research projects have scientific rigor and integrity to make substantially relevant contributions to the MHS and scientific communities
- Facilitated enhanced grant execution through more effective utilization of personnel and infrastructure. This development allowed the NICoE to expand its partnerships, launch new and innovative research protocols, and advance the state of the science and execute approximately $4.5 million in NICoE research grants
- Established new and innovative research findings through collaboration and partnership with 12 federal and six academic partners

> *"I was especially impressed by the expertise, teaching, and professionalism afforded to me by the NICoE staff in support of my elective. As a result of the 4-week elective I produced a case-report abstract (co-authored by NICoE staff) which was accepted for resident poster presentation at the American Psychiatric Association Annual Conference 2015 in Toronto, Canada."*
>
> ***– Nicholas Tamoria,***
> *MD, Psychiatry Chief Resident*
> *WRNMMC*

VI. EDUCATING AND COMMUNICATING TO THE MHS

Beyond patient care, the NICoE is committed to ongoing intellectual exchange with the MHS, private health care facilities and academic organizations by sharing best practices focused on this patient population. Serving as a hub for developing and sharing knowledge related to comorbid TBI/PH research and treatment, the NICoE welcomes visitors year-round and has hosted numerous conferences, symposiums and events.

> *"I found the NICoE Academic Program to be fundamental as an introduction to my current field of work and a great process through which I was able to establish a solid entry level skill set necessary in the transition between having solely academic experience and being able to contribute to an actual work environment. The program had a very real effect: my entire current professional forward progress and planning is a consequence of my work as a NICoE Red Cross neuroimaging Research Assistant."*
>
> ***– Alex Kubli,***
> *Former NICoE student*

THE NICOE ACADEMIC PROGRAM

The NICoE Academic Program provides experiential learning opportunities for a host of students from high school and undergraduates to medical students and residents. For the high school and undergraduate students, spending time with accomplished healthcare professionals can instill interest in the study of TBI, healthcare careers and future service in military medicine. For medical students and residents, it is a chance to learn about integrative medicine, including medical acupuncture, as well as the fundamentals of research methodology from renowned medical researchers.

In FY14, the NICoE sponsored 14 medical residents, three USU medical students, 13 graduate students and 10 undergraduate and high school students.

Scholarly activities by the residents included:

- Assistance in the publication of two abstracts and five posters that were accepted to national conferences and symposiums
- Facilitation of data collection process for an upcoming biofeedback protocol
- Participation in a new integrative medicine clinical rotation

FIVE-YEAR STRATEGIC PLAN IMPACT

Maximizing use of the NICoE's talent

In FY14, the NICoE maximized the use of the NICoE's talented providers and staff through the medical education elective rotations for the NICoE's residency trainees and students. Programs such as these help both the students and the staff to learn and grow in their profession and field.

By engaging students at all levels, the NICoE is helping to prepare future researchers and clinicians to understand the complexities of TBI and to engage with this patient population in the future. One of the NICoE's former healing arts interns became a healing arts therapist at the Intrepid Spirit at Fort Belvoir, and a former NICoE speech-language pathology student was hired for a fellowship year at WRNMMC.

PROJECT ECHO

The Extension for Community Healthcare Outcomes, or Project ECHO, is a bi-monthly video tele-education (VTE) forum created in collaboration with the University of New Mexico. It invites attendees to share clinically significant case studies from the larger TBI/PH medical community. As many as 25 locations participate, allowing for discussion around emerging best practices and subsequent implementation in treatment.

During FY14, the NICoE facilitated five Project ECHO TBI sessions, providing over 265 Continuing Education Units (CEUs) to physicians and registered nurses throughout the MHS. Through lessons learned and information sharing, Project ECHO positively influences TBI care delivery and fosters an integrated team approach to care.

To reach a wide audience for professional TBI education, the NICoE transitioned Project ECHO TBI in partnership with the U.S. Department of Veterans Affairs (VA) and DVBIC to launch a new quarterly TBI Clinical Grand Rounds VTE using advanced technology through Adobe Connect. This series covers a broad range of TBI related topics and includes speakers and participants throughout the VA and MHS. The TBI Clinical Grand Rounds VTE offers CEUs for most healthcare disciplines which directly support the MHS's educational outreach efforts. The September kick-off event logged over 75 participating locations.

FIVE-YEAR STRATEGIC PLAN IMPACT
Maximizing use of the NICoE's talent
In FY14, the NICoE developed additional professional opportunities for the NICoE staff through the pursuit of additional Continuing Education Units from the Project ECHO program. This program allows providers to hear case studies from partnering organizations on TBI/PH related topics.
Effectively communicating the NICoE's distinct mission
Opportunities like Project ECHO help the NICoE share its mission and accomplishments with participating organizations. By being at the forefront of an information sharing opportunity like this, the NICoE is able to share emerging best practices with a large number of TBI/PH professionals.

THE NICOE IN THE NEWS

The NICoE drew significant media attention in FY14, especially focusing on the opening of the Intrepid Spirits and the NICoE's integration of alternative and oftentimes ground-breaking therapies into each patient's evaluation and treatment.

Intrepid Spirits

- **"New Brain/PTSD Center Opens", *NBC News*:** Many local news outlets announced the opening of the Intrepid Spirit at Fort Hood in June, and in September the Fort Campbell opening made national news on NBC News.

Virtual Reality

- **"A 21st-century method for fighting PTSD", WTOP:** Virtual Iraq puts service members back in the war zones they left behind, complete with the smells and vibrations of their experiences at war in the Middle East. While it may seem counterintuitive to make service members remember the very things that caused their TBI or PTSD, a nurse working with the service members said, "Reliving that will enable them to get past it."

Alternative Modalities

- **"Navy psychiatrist's acupuncture, meditation methods embraced by special operators", *Navy Times*:** In May, Navy Times interviewed CAPT Robert Koffman, a U.S. Navy psychiatrist working at the NICoE, about his unconventional methods for treating PTSD. The article noted that "Talk therapy and medication have their place…but he's seen firsthand how alternative treatments such as acupuncture and meditation have helped troops manage their anxiety and chronic pain."

FIVE-YEAR STRATEGIC PLAN IMPACT

Effectively communicating the NICoE's distinct mission

In FY14, the NICoE had the opportunity to participate and share its mission through a number of media events and stories. The utilization of this medium shares the NICoE's accomplishments and value with a wide audience, including stakeholders and potential future patients and referring providers.

Healing Arts

- **"War's Elite Tough Guys, Hesitant to Seek Healing", *New York Times*:** The New York Times recognized the NICoE's Art Therapy Program in June, quoting a former NICoE patient as saying, "The point of all this therapy is, now you see your demon coming and you say, 'Good morning. How you doing?' Your demons will be on the street. You don't have to embrace them. But you have to be able to say, 'Good morning,' and let them go."

- **"Words of war, peace of mind: The Veterans Writing Project", *The Virginian-Pilot* (reprinted in *Stars and Stripes*):** In July, The Virginia-Pilot and Stars and Stripes published a story about the Veterans Writing Project, a workshop at the NICoE that encourages patients to write down their stories with no concern about grammar or spelling. A patient who feels he has deployed more times that he wants to remember explained "writing has helped him make sense of what happened and the person he is now. It's quieted his self-criticism, eased his depression and shown him meaning."

- **"Music Therapy and Military Populations: An Update", *The Huffington Post*:** In March, the National Endowment of the Arts' partnership with the NICoE was spotlighted in The Huffington Post after the release of the report Music Therapy and Military Populations: A Status Report and Recommendations on Music Therapy Treatment, Programs, Research, and Practice Policy. Shep Crumrine, a music therapist at the Milwaukee VA Medical Center, said, "Music and creative arts therapies don't just help with the initial momentum needed for effective treatment; they keep veterans engaged for sustainable recovery."

Warrior Canine Connection

- **"Canines Help Soldiers Connect and Heal in Counseling", *ABC News with Diane Sawyer*; "Power of dogs to help heal our veterans", Fox News, *The Real Story*; "Researchers try to verify whether canines help patients with TBI, PTSD", *Marine Corps Times*:** The Warrior Canine Connection's new litter of puppies made the news in various local and national markets, including ABC News with Diane Sawyer and Fox News' The Real Story. The NICoE patients with PTSD trained some of the puppies to be service dogs for mobility-impaired veterans, and in the process they received timely help for themselves. One service member recounted, "I could tell a story. I could cry. I could do anything and she's not going to judge me."

EDUCATION AND COMMUNICATION ACCOMPLISHMENTS AT A GLANCE

In FY14, the NICoE:

- Sponsored and provided experiential learning opportunities for 14 medical residents, three medical students, 13 graduate students and 10 undergraduate and high school students
- Facilitated five Project ECHO TBI sessions, providing over 265 CEUs to medical personnel across the MHS
- Transitioned NICoE ECHO TBI, in cooperation with the VA and DVBIC, to launch a new quarterly TBI Clinical Grand Rounds VTE using Adobe Connect technology
- Associated with two more Intrepid Spirit locations that reached important milestones. In Texas, ground was broken at the Intrepid Spirit Fort Hood location, and in Kentucky, Intrepid Spirit Fort Campbell opened its doors
- Utilized personnel and programs, such as integrative medicine, the Warrior Canine Connection, healing arts and alternative modalities, which were featured in the media throughout FY14. Outlets that covered these stories include: *ABC News with Diane Sawyer*, Fox News' *The Real Story*, the *New York Times*, *the Virginia-Pilot*, *Stars and Stripes*, *The Huffington Post*, *Navy Times* and WTOP radio

VII. MHS TBI PATHWAY OF CARE

The NICoE experienced a significant transition at the end of FY14 that clarified the NICoE's alignment to WRNMMC and the organization's role within the MHS TBI Pathway of Care (the Pathway). This clarification came from the signing of "The Military Health System Traumatic Brain Injury Pathway of Care and Alignment of the National Intrepid Center of Excellence within that Pathway" memorandum by Assistant Secretary of Defense for Health Affairs, Dr. Jonathan Woodson, in September 2014. The memorandum solidified the NICoE's alignment under WRNMMC with research support from USU.

The Pathway development began in January 2014 when Dr. Woodson established an Integrated Process Team to define the Pathway and the NICoE's alignment within it. The Pathway provides the MHS with a cohesive standard for TBI treatment practices and care, dissemination of information, and implementation and oversight of established protocols. Led by the Defense Health Agency (DHA) to officially unite DoD TBI organizations and provide specialized healthcare services for service members with TBI, the Pathway greatly advanced the integration of the NICoE into WRNMMC and the MHS.

DVBIC, in collaboration with an advisory committee with stakeholder representatives from the DHA, Services, DCoE, NICoE, USU, VA and Army Medical Research and Materiel Command, is the appointed manager of the Pathway for clinical, research, and education and training activities for standardized TBI care across the MHS. All sites of TBI care, including the Intrepid Spirit Centers, will come under the command of their local MTF. However, the Pathway will operate from a collective, principal clinical mission, and DVBIC will assist with and have clinical and research oversight of MHS-funded TBI research. The NICoE fulfills a critical role within the Pathway by:

- Addressing the most complex diagnostic and treatment challenges for patients with TBI and complex psychological and social challenges who have persistent impairment of function despite intensive treatment
- Conducting complex diagnostic evaluations and holistic intensive day treatment to clarify diagnoses, begin long-term recovery and instill hope for both patients and families
- Act as the primary site for conducting translational research to foster improved outcomes across the enterprise and beyond

VIII. WHAT'S NEXT

Over the next year, the NICoE will have many opportunities to excel and become more fully integrated within WRNMMC and the Pathway community. The NICoE leadership plans to adapt to these changes by executing their newly defined FY15 Strategic Plan with goals, objectives and priorities that meet the new set of standards set by the Pathway to achieve the desired future impact and operation of the NICoE as a world-class clinical research institute. The NICoE leadership will continue to improve the alignment of day-to-day operations and long-term priority execution to achieve accomplishments in areas of research, education, partnerships, clinical care and contributions to the Pathway and the WRNMMC campus in FY15.

The NICoE's continuous efforts are directed to support four main goals:

1. **Clinical care:** Become recognized for its value and clinical proficiency by local and national entities
2. **Research discoveries:** Advance the understanding of the TBI/PH disease state and patients' responses to treatment
3. **Impact to the MHS:** Be recognized as a national TBI/PH resource
4. **Infrastructure and staff:** Align and sustain the NICoE's resources for mission success within the local and national TBI Pathway of Care

Clinical Care

The NICoE will be evaluating its programs with respect to the required length of stay in order to extend treatment to new patients. The expansion of non-cohort service offerings will increase the NICoE's capability to support a broad patient base with varying needs and allow for the organization to say yes to more MHS patients.

The NICoE leadership is prepared to identify the NICoE's best practices and communicate those findings with DVBIC to better serve patients across the MHS. The NICoE and DBVIC leadership will maintain open lines of communication and facilitate sharing of materials and information to provide continuity of TBI care.

Research Discoveries

Through the exploration of current and future research and academic collaborations, the process for research will be fine-tuned in FY15 to facilitate discoveries that impact the NICoE patient cohort, even beyond combat-related TBI. The NICoE will refine the research infrastructure, improve methods of data capture, increase the bandwidth for manuscript preparation, develop standard operating procedures and integrate the imaging research agenda into the broader research program. More significant results can be achieved and analyzed through the new Research Synergy Board with CNRM and USU. By pooling funds, resources and personnel with an integrated and unified front, the NICoE and fellow Pathway researchers will be able to offer more value to patients.

Impact to the MHS

The NICoE will continue to make strides in research advances and provide exceptional care for its patients while serving as a resource to DVBIC, the Intrepid Spirits and the other Pathway organizations. The NICoE strives to be a leading source of information and best practices on TBI/PH aiding partner organizations in their research, treatment and education. Partnering and aligning with WRNMMC, CNRM and USU and DVBIC on the NICoE's strategic communications will extend the NICoE's reach to those who need its offerings and reinforce its unity with the MHS.

> *"The team approach and provider to patient ratio was the determining factor in providing such a high level of care. The quality that results sets an environment in which substantive, permanent change and symptom resolution can occur."*
>
> ***– NICoE Patient***

Infrastructure and Staff

The recently signed MHS TBI Pathway of Care memorandum dictates realignment and reevaluation of the NICoE's resources. The NICoE will examine its resource allocation to share with other organizations within the Pathway and seek help filling gaps with resources across the MHS, contributing to the cooperative spirit of the coalition. Through these cooperative efforts, the NICoE will strengthen the MHS, helping service members with TBI/PH conditions by partnering with other Pathway organizations to share best practices and find solutions to complex problems.

Appreciating that the staff at the NICoE are the organization's most valuable resource, efforts will be made to continue to build on an already positive work environment. Ensuring professional development opportunities and work-life balance initiatives are actively explored and implemented when feasible will remain priorities in FY15.

The NICoE's achievements in FY14 have contributed to advancements in the research, clinical and education segments of the organization. Continued efforts driving the NICoE's areas of concentration will focus on integration and seamless leveraging of campus resources with WRNMMC, USU, DVBIC and entities within the DoD and the Pathway.

IX. ADDENDUM

In FY14, the NICoE staff was actively involved in publishing journal articles and papers and giving presentations and lectures on various clinical research findings. The full list is provided below.

JOURNAL ARTICLES

Dretsch, M., Coldren, R.L., Kelly, M.P., Parish, R.V., & Russell, M.L. (2014). **Eight day temporal stability of the Automated Neurological Assessment Metric (ANAM) in a deployment environment.** *Applied Neuropsychology, in press.*

Dretsch, M., Bleiberg, J., Williams, K., Caban, J., Kelly, J., Grammer, G. & DeGraba, T. (2014). Three scoring approaches to the Neurobehavioral Symptom Inventory for measuring clinical change in service members receiving intensive treatment for combat-related mTBI. *Journal of Head Trauma & Rehabilitation,* in press.

DeGraba TJ., Williams K., Caban J., Bleiberg J., Grammer G., & Kelly J. (2014, October). **Persistent Symptom Severity in Service Members with Combat Related TBI with and without PTSD.** *Annals of Neurology,* 76(S18):134.

Ghahramanlou-Holloway, M., Brown, G.K., Currier, G.W., Brenner, L., Knox, K.L., **Grammer, G.,** … Stanley, B. (2014, September). **Safety Planning for Military (SAFE MIL): Rationale, design, and safety considerations of a randomized controlled trial to reduce suicide risk among psychiatric inpatients.** *Contemporary Clinical Trials,* 39(1), 113-22.

Nathan, D., Yeh, P., French, L., **Harper, J., Liu, W.,** Wolfowitz, R., **… Riedy, G.** (2014, September). **Exploring Spatial Variations in Resting State Default-Mode Networks in Mild Traumatic Brain Injury.** *Journal of Neuroengineering and Rehabilitation,* in press.

Grammer, G., Green, V., Amin, R. & **Alampay M.** (2014, June). **The role of rTMS in psychiatric disorders other than major depression.** *Psychiatric Annals,* 44(6), 293-298.

Yeh, P., Wang, B., **Oakes, T.,** French, L., Pan, H., **Graner, J., … Riedy, G.** (2014, June). **Postconcussional disorder and PTSD symptoms of militarily-related traumatic brain injury associated with compromised neurocircuitry.** *Human Brain Mapping,* 35(6), 2652-2673.

Kochanski-Ruscio, K., Carreno-Ponce, J., DeYoung, K., **Grammer, G.,** Ghahramanlou-Holloway, M. (2014, April). **Diagnostic and psychosocial differences in psychiatrically hospitalized military service members with single versus multiple suicide attempts.** *Comprehensive Psychiatry,* 55(3), 450-456.

Dretsch, M., Johnston, D., Bradley, R., Macrae, H., Deuster, P., Harris, W. (2014, April). **Effects of omega-3 fatty acid supplementation on neurocognitive functioning and mood in deployed U.S. Soldiers: a pilot study.** *Military Medicine,* 179, 396-403.

Roach, E., **Bleiberg, J.,** Lathan, C., Wolpert, L., Tsao, J. & Roach, R. (2014, April). **AltitudeOmics: Decreased reaction time after high altitude cognitive testing is a sensitive metric of hypoxic impairment.** *Neuro Report,* 25 (11), 814-818.

George, M., Raman, R., Benedek, D., Pelic, C., **Grammer, G.,** Stokes, K., … Stein, M. (2014, March). **A two-site pilot randomized 3 day trial of high dose left prefrontal repetitive transcranial magnetic stimulation (rTMS) for suicidal inpatients.** *Brain Stimulation,* 7(3), 421-431.

Byrnes, K., Wilson, C., Brabazon, F., von Leden, R., Jurgens, J., **Oakes, T.,** & Selwyn, R. (2014, January). **FDG-PET imaging in mild traumatic brain injury: a critical review.** *Frontiers in Neurogenergetics,* 5, 13.

Little, D., Geary, E., Moynihan, M., **Alexander, A., Pennington, M., Dretsch, M.,** … Huang, J. (2014, January). **Imaging chronic traumatic brain injury as a risk factor for neurodegeneration.** *Alzheimer's and Dementia,* 10(3), S188-S195.

Dretsch, M., Coldren, R.L., Kelly, M.P., Parish, R.V., & Russell, M.L. (2013, June). **No effect of testing environment on neurocognitive functioning in deployed U.S. Soldiers.** *Applied Neuropsychology: Adult,* 4, 272-276.

LETTERS TO EDITOR

Grammer, G. & Perera, T. (2014, June). **Transcranial Magnetic Stimulation and Neuromodulation.** Psychiatric Annals, 44(6), 270–272.

POSTER PRESENTATIONS

Rangaprakesh, D., Deshpande, G., Daniel, T.A., Katz, J.s., Deney, T., Traynham, S., **Dretsch, M. (2014, August). Functional MRI Investigation of the Neural Correlates of Compromised Memory in Soldiers with Postconcussion Syndrome and Posttraumatic Stress Disorder.** Poster presented at the *Military Health System Research Symposium,* Fort Lauderdale, Florida.

Neuges, D., Grammer, G., Yam, P., Wiliams, K., Dretsch, M., Razumovsky, A., & **DeGraba, T.** (2014, August). **Trancranial Doppler Measure of Persistent Cerebral Vasomotor Reactivity Abnormality in Service Members With Chronic mTBI.** Poster presented at the *Military Health System Research Symposium,* Fort Lauderdale, Florida.

Soderlund, K., **Liu, W., Senseney, J.,** Joy, D., **Yeh, P., Graner, J., Ollinger, J.,** Liu, T., **Wang, Y., Oakes, T., & Riedy, G.** (2014, August). **Imaging Cerebral Microhemorrhages in Military Service Members with Traumatic Brain Injury with Susceptibility Weighted Imaging and Quantitative Susceptibility Mapping. Poster presented at the** *Military Health System Research Symposium,* Fort Lauderdale, Florida.

Crawford, F., Emmerich, T., Abdullah, L., Mouzon, B., Evans, J, **Dretsch, M.,** & Mullan, M. (2014, July). **Plasma Lipidomic TBI Biomarker Profiles – Translation from Mouse to Human.** Poster presented at the *National Neurotrauma Symposium,* San Francisco, California.

DeGraba, T., Brooks, P., Casagrande, G., Caban, J., & Hoover, P. (2014, July). **Neuroendocrine and Nutrition Status in Active Duty Service Members with mTBI and Psychological Health Diagnosis.** Poster presented at the *National Neurotrauma Symposium,* San Francisco, California.

DeGraba, T., Popescu, M., Popescu, A., Balbir, A., Bleiberg, J., Riedy, G., Balkin, T., & **Merrifield, W.** (2014, July). **Resting-state Brain Activity in Mild TBI Patients with High Versus Low Post-Traumatic Stress Disorder Symptom Severity.** Poster presented at the *National Neurotrauma Symposium,* San Francisco, California.

DeGraba, T., Williams, K., Caban, J., Bleiberg, J., Grammer, G., & Kelly, J. (2014, July). **Differences in Symptom Severity in mTBI Patients with and without PTSD.** Poster presented at the *National Neurotrauma Symposium,* San Francisco, California

Dretsch, M., Wood., K., Daniel, M., Goodman, M., Katz, J., & Knight, D. (2014, July). **Disrupted Neural Circuitry Associated with Emotional Threat in U.S. Soldiers with PTSD.** Poster presented at the *9th Annual Amygdala, Stress and PTSD Conference,* Bethesda, Maryland.

DeGraba, T., Popescu, M., Popescu, A., Balbir, A., Bleiberg, J., Riedy, G., Merrifield, W. (2014, June). **Resting-State Brain Activity in mild TBI Patients with High Versus Low Post-Traumatic Stress Disorder Symptom Severity.** Lecture presented at 32nd *Annual National Neurotrauma Symposium,* San Francisco, California.

Crosby, D., Grammer, G., Popescu, M. Liu, W., Popescu, A., (2014, May). **Assessment of TMS interference on MRI and MEG acquisition.** Poster presented at *Clinical TMS Society Annual Meeting,* New York, New York.

Grammer, G., Kuhle, A., Scacca, C., Dretsch, M. (2014, May). **Transcranial Magnetic Stimulation Treatment Frequency During Induction Is Associated with Higher Rates of Remission In Patients with Depression.** Poster presented at *Clinical TMS Society Annual Meeting,* New York, New York.

Livornese, K., Vedder, J., & Brads-Pitt, T. (2014, May). **Using an Integrated Collaborative Approach to Treat Comorbid mTBI and Psychological Health Conditions.** Poster presented at the 22nd *Annual USPHS Nurse Recognition Day,* Bethesda Maryland

Green, V., Bleiberg, J., Caban, J., DeGraba, T., Grammer , G., Kinsman, E., & Wolf, J. (2014, May). **Modality Satisfaction in Service Members with Treatment Resistant PTSD and mTBI Undergoing Interdisciplinary Treatment at the NICoE.** Poster presented at the *American Psychiatric Association Annual Meeting,* New York, New York

Kinsman, E. Green, V., Bleiberg, J., Caban, J., Grammer, G., DeGraba, T. (2014, May). **Symptom Validity and PCL-M Scores in Service Members with mTBI and Comorbid Disorders in an Interdisciplinary Intensive Outpatient Treatment** Program. Poster presented at the *American Psychiatric Association Annual Meeting,* New York, New York.

Stewart, F., Yates, B., **Staver, T., Dretsch, M., DeGraba, T., Caban, J.** (2014, May). **Hyperventilation in Military Personnel with Mild TBI.** Poster presented at the *American Psychiatric Association Annual Meeting,* New York, New York.

Winn, A., **Garrison, J.,** Green, V., Slye, A., Williamson, D. (2014, May). **Musical Mnemonics Training in a Patient with Anterograde Amnesia.** Poster presented at the *American Psychiatric Association Annual Meeting,* New York, New York.

DeGraba, M., Merrifield, W., Mattingly, E., Mikola, J., Popescu, M., Popescu, A., Balbir, A., Balkin, T., **Bleiberg, J., & DeGraba, T.** (2014, April). **MEG Findings Correlate to Speech-Language Pathology Deficits in Combat-Related mTBI and PTSD.** Poster presented at the *American Academy of Neurology Conference,* Philadelphia, Pennsylvania.

Katz, J., Daniel, A., Goodman, A., Denney, T., Deshpande, G., Iverson, G. & **Dretsch, M.** (March, 2014). **Functional MRI Correlates of Emotional Dysregulation in U.S. Soldiers with Post-Concussion Syndrome.** Poster presented at the *10th World Congress on Brain Injury,* San Francisco, CA.

Pape, M., Snyder, J. (2014, February). **An Interdisciplinary Approach to Vestibular Disturbances: A Case Study.** Poster presented at the *American Physical Therapy Combined Sections Meeting,* Las Vegas, Nevada.

Alampay, M., Bleiberg, J., Fren, V., **Kinsman, E., Grammer, G.** (2014, January). **Potential Cause for False Worsening of PCL-M Scores: A NICoE Case Series.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Bleiberg, B., Senseney, J. & Caban, J. (2014, January). **Adaptive Controller for Volumetric Display of Neuroimaging Studies.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Brooks, P., Casagrande, G., Caban, J., Hoover, P. & DeGraba, T. (2014, January). **Neuroendocrine and Nutrition Related Laboratory Test Results from an Outpatient Clinic Providing Interdisciplinary Evaluation for Active Duty Service Members with mild Traumatic Brain Injury and Psychological Health Diagnoses.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

DeGraba, T., Bleiberg, J., Grammer, G., Caban, J., Koffman, R., Bell, J., Dretsch, M., Williams, K., & Kelly, J. (2014, January). **Interdisciplinary Assessment and Care in Service Members with Combat Related mTBI and PTSD.** Poster presented at the *American Academy of Neurology Conference,* Philadelphia, Pennsylvania.

DeGraba, T., Caban, J., Bleiberg, J., Grammer, G., Kelly, J. (2014, January). **Utility of the Neurobehavioral Symptom Inventory to Assess Efficacy of an Interdisciplinary Treatment Program for Service Members with Combat-Related mTBI.** Poster presented at the *NCA TBI Research Symposium***,** Bethesda, Maryland.

Gager, P., Hoover, P., Brooks, P. (2014, January). **Multiple Mild TBI and Repetitive Blast Exposure in US Military Special Operations Commandos: Neuropsychological, Emotional, and Physical Consequences.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Graner, J., Gager, P., Brooks, P., Oakes, T.R., Kubli, A. & Riedy, G. (2014, January). **Exploring Functional MRI Correlates of Impaired Attention in Military TBI.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Kruger, S., Kodosky, P. & Pape, M. (2014, January). **Utilization of the Computer Assisted Rehabilitation Environment as a Physical Therapy Modality for Service Members with Common Post-Concussive Limitations.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Liu, W., Soderlund, K.**, Senseney, J.S., Yeh, P., Graner, J., Ollinger, J. … Riedy, G., &** (2014, January). **Longitudinal Imaging of Cerebral Microhemorrhages using Qualitative and Quantitative Susceptibility Imaging in Military Service Members with Traumatic Brain Injury.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Mattingly, E., Caban, J. & Mikola, J. (2014, January). **Speech-Language Pathology Findings from Standardized Cognitive Evaluation of 485 Service Members with Traumatic Brain Injury and Psychological Health Comorbid Diagnoses.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Moorer, C., Reinsfelder, A. & Lindholm, M. (2014, January). **The Role of Cognitive and Visual Assistive Technologies in the Rehabilitation Process for Service Members with Mild Traumatic Brain Injury.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Popescu, M., Popescu, A., DeGraba,T., Balbir, A., Bleiberg, J., Riedy, G., Balkin, T. **& Merrifield, W.** (2014, January). **Resting state brain activity in mild TBI Patients with High Versus Low PTSD Symptom Severity.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Roy, M., Costanzo, M., Leaman, S., Law, W., Taylor, P., **Ndiongue, R.….Wassermann, E.** (2014, January). **Identification of Predictors of Post-Deployment Neurocognitive Syndromes in Combat Veterans.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Senseney, J., Oakes, T. & Riedy, G. (2014, January). **VisN: Neuroimaging Toolkit for Medical Image Visualization.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Snyder, J., Caban, J. & Nousak, J. (2014, January). **The Effects of Interdisciplinary Treatment on Tinnitus in Active Duty Service Members with mTBI/PH : A Four Week Diagnostic Approach.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Staver, T., Stewart, F. & Caban, J. (2014, January). **Improvements in Heart Rate Variability after Four Weeks of Interdisciplinary Care.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Stewart, F., Yates, B. & Staver, T. (2014, January). **Prevalence of Hyperventilation in Military Personnel with mild TBI.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Williams, K., Caban, J., Bleiberg, J. & DeGraba, T. (2014, January). **Differences in Neurobehavioral Symptom Inventories (NSI) in mTBI patients with and without PTSD.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Yeh, P., Ollinger, J., Wang, B., Joy, D., Liu, W., Oakes, T. & Riedy, G. (2014, January). **Multimodal Neuroimaging of Military-related Traumatic Brain Injury.** Poster presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Yeh, P., Jouge, E., **Morisette, J.,** Kuo, L., Yeh, F., **Liu, W. …Riedy, G.** (2014, January). **Tractography of Richardson-Lucy Spherical Deconvolution under Rician Noise of Sparse Multiple q-Shell Diffusion Imaging.** Poster presented at the *2014 International Society of Magnetic Resonance in Medicine Conference,* Milan, Italy.

Yeh, P., Lee, N., **Morissette, J.,** Kuo, L., Yeh, F., Jouge, E. **…Riedy, G.** (2014, January). **Evaluation of Diffusion Spectrum Imaging Reconstruction with Trained Dictionaries Use of 3T MR.** Poster presented at the *2014 International Society of Magnetic Resonance in Medicine Conference,* Milan, Italy.

Stewart, F., Garrison, J. & DeGraba, T. (2014, January). **The Influence of Music Therapy on Heart Rate Variability at the National Intrepid Center of Excellence.** Poster presented at the *American Association for Applied Psychophysiology and Biofeedback Conference, Savannah,* Georgia.

Stewart, F., Staver, T., Lucie, A. & Moorer, C. (2014, January). **Biofeedback Use in the Interdisciplinary Treatment of Combat-Related PTSD and TBI at the National Intrepid Center of Excellence.** Poster presented at the *American Association for Applied Psychophysiology and Biofeedback Conference,* Savannah, Georgia.

Stewart, F., Yates, B. & **Staver, T.** (2014, January) **Prevalence of Hyperventilation in PTSD.** *Poster presented at the American Association for Applied Psychophysiology and Biofeedback Conference,* Savannah, Georgia.

LECTURES

Grammer, G. (2014, September). **Depression in Primary Care,** Lecture presented at the *DCoE Summit,* Bethesda, Maryland.

Mikola, J. (2014, September). **Deficits Not Diagnoses: Symptom-Based Cognitive Treatment.** Lecture presented at *The Defense and Veterans Brain Injury Center 2014 TBI Global Synapse,* Bethesda, Maryland.

Kelly, J. (2014, September). **Concussions.** Lecture presented at the *Department of Neurosurgery Grand Rounds,* University of Colorado School of Medicine, Denver, Colorado.

Kelly, J. (2014, September). **Sport Concussion Update.** Lecture presented at the *2014 Defense and Veterans Brain Injury Center TBI Global Synapse,* Arlington, Virginia.

Caban, J. (2014, August). **A Large-scale Informatics Database fostering Innovation, Research and Development for mTBI/PTSD.** Lecture presented at the *Military Health System Research Symposium,* Fort Lauderdale, Florida.

DeGraba, T. (2014, August). **Differences in Symptom Severity in mTBI Patients With and Without PTSD.** Lecture presented at the *Military Health System Research Symposium,* Fort Lauderdale, Florida.

Dretsch, M., Silverberg, N., Iverson, G. (2014, August). **Multiple Past Concussions Are Associated with Ongoing Symptoms but not Cognitive Impairment in Active Duty Army Soldiers.** Lecture presented at the *Military Health System Research Symposium,* Fort Lauderdale, Florida.

Riedy, G. (2014, August). **Neuroradiology Findings in a Cohort of Military Service Members with Traumatic Brain Injury.** Lecture presented at the *Military Health System Research Symposium,* Fort Lauderdale, Florida.

Kelly, J. (2014, July). **Keynote Address.** Lecture presented at *The Sports Concussion Conference, American Academy of Neurology,* Chicago, Illinois.

Grammer, G. (2014, June). **Transcranial Magnetic Stimulation (TMS) Use for Pain Disorders.** Lecture presented at the 2014 Kenneth L. Artiss Symposium on Psychiatry and Pain Management. Bethesda, Maryland.

Kelly, J., DeGraba, TJ., Wolf, J., & Grammer, G. (2014, May). **1. The National Intrepid Center of Excellence Model of Care. 2. Multiaxial Model of TBI and Sequelae. 3. Comorbid Substance Use Considerations in the TBI and PTSD Populations. 4. Research Platform and Preliminary Findings from the NICoE.** Lectures presented at the *American Psychiatric Association.* New York, New York.

Kelly, J. (2014, May). **Concussion in the Military and in Sports.** Lecture presented at the 2014 *Annual American Academy of Neurology Meeting,* Philadelphia, Pennsylvania

Kelly, J. (2014, May). **Advances in Assessment and Treatment of MTBI.** Lecture presented at the *American Psychiatric Association,* New York, New York.

DeGraba, T, (2014, May). **A Model of Interdisciplinary Holistic Care in Complex Service Members with TBI and PHI at the National Intrepid Center of Excellence.** Lecture presented at the *American Psychiatric Association Annual Meeting,* New York, New York.

DeGraba, T. (2014, May). **Use of Advanced Technology to Identify Pathophysiological Changes in Service Members with Co-Morbid TBI and PH conditions.** Lecture presented at the *American Psychiatric Association Annual Meeting,* New York, New York.

Walker, M. (2014, May). **Multimodal Approaches to PTSD Treatment.** Lecture presented at *American Psychiatric Association Annual Meeting,* New York, New York.

DeGraba, M., Merrifield, W., Mattingly, E., Mikola, J., Popescu, M., Popescu, A., … DeGraba T. (2014, April). **MEG Findings Correlate to Speech-Language Pathology Deficits in Combat-Related mTBI and PTSD.** Lecture presented at *American Academy of Neurology Conference,* Philadelphia, Pennsylvania.

DeGraba, T., Kelly, J., Bleiberg, J., Grammer, G., Caban, J., Bell, J., Koffman, R. (2014, April). **Interdisciplinary Assessment and Care in Service Members with Combat Related TBI and PTSD.** Lecture presented at *American Academy of Neurology Conference,* Philadelphia, Pennsylvania.

Kelly, J. (2014, April). **Concussions.** Lecture presented at the 82nd American Association of *Neurological Surgeons Annual Scientific Meeting,* San Francisco, California.

Kelly, J. (2014, April). **NICoE Overview.** Lecture presented at the *Department of Defense/Veterans Affairs Auditory Research Working Group (ARWG) Discussions,* Bethesda, Maryland.

Walker, M. (2014, April). **Alternative Therapies for Wounded Warriors: Art Therapy.** Lecture presented at *Second Annual Walter Reed National Military Medical Center Trauma Symposium,* Bethesda, Maryland.

Kelly, J. (2014, March). **The National Intrepid Center of Excellence: An Instrument of Hope, Healing, Discovery, and Learning** Lecture presented at the *Healthcare Design Academy Conference,* Bethesda, Maryland.

Kelly, J. (2014, March). **Returning to Work: Making Headway after Brain Injury.** Lecture presented at the *Congressional Brain Injury Task Force on Capitol Hill,* Washington, DC.

Kelly, J. (2014, February). **Chronic Traumatic Encephalopathy (CTE).** Lecture presented at the *Navy Medicine Professional Development Center and National Intrepid Center of Excellence (NICoE) ECHO TBI,* Bethesda, Maryland.

Caban, J. (2014, January). **A Large Scale mTBI Informatics Database: Fostering Innovation, Research and Development for mTBI/PTSD.** Lecture presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

DeGraba, T. (2014, January). **Utility of the Neurobehavioral Symptom Inventory to Assess Efficacy of an Interdisciplinary Treatment Program for Service Members with Combat Related mild TBI.** Lecture presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Dretsch, M. (2014, January). **Disrupted Neural Circuitry Associated with an Emotional Threat Task in U.S. Soldiers.** Lecture presented at *9th Annual Amygdala, Stress and PTSD Conference,* Bethesda, Maryland

Riedy, G., Senseney, J., Caban, J., Liu, W., Harper, J., Sham, E. …Oakes, T.R. (2014, January). **Neuroradiology Findings in a Cohort of Military Service Members with Traumatic Brain Injury.** Lecture presented at the *NCA TBI Research Symposium,* Bethesda, Maryland.

Walker, M. (2013, December). **NICoE Healing Arts Program.** Lecturer presented at *The German School of Washington, D.C.,* Potomac, Maryland.

Walker, M. (2013, October). **The Art Therapy Program at NICoE,** Lecture presented for *The Arts & the Military Course, University of Maryland,* College Park, Maryland.

X. ADDENDUM II

In FY14, the NICoE staff held various positions on a number of working groups and advisory committees in the TBI/PH community. Additionally, the NICoE staff were asked to be peer reviewers on over a dozen scientific Journals throughout FY14. An abbreviated list of these working groups, advisory committees and Journals can be found below.

WORKING GROUPS & ADVISORY COMMITTEES

Bob Woodruff Foundation: Convening on Animal Assisted Therapy in Service Members with Post Traumatic Stress. Expert Panel and Lecturer

Brain Trauma Foundation mTBI Definition Group and Concussion Definition Consortium Task Force 2014

Centers for Disease Control and Prevention Advisory Committee

Clinical TMS Society Research Committee Chief and Member of Board of Directors

Combat Casualty Care Research Program, Joint Program Committee-6 Member

Data Safety and Monitoring Board Member for the National Institute of Disability and Rehabilitation Research

DCoE/DVBIC: Concussion Health Outcomes Standardization Initiative: Outcome Metrics Committee

DoD Blast Injury Research FY13 and FY12 Reports to the Executive Agent on Science and Technology Efforts and Programs Relating to the Prevention, Mitigation, and Treatment of Blast Injuries Contributor

DoD Center of Excellence Research Directorate Member

Department of Defense, PH/TBI Registry Working Group

DoD and Department of Veterans Affairs, Expert Committee on the Management of Headache Following Concussion/Mild Traumatic Brain Injury

DICOM Medical Imaging Standard Working Group

DVBIC Headache Expert Working Group

DVBIC committee to select DOD-wide TBI outcome assessment procedures, for the Office of Outcomes and Assessments

Federal Interagency Traumatic Brain Injury Research National Database: Strategic Vision Steering Committee

Human Performance Optimization Working Group

International TBI CDE FDA Compliance Working Group

National Center for Injury Prevention and Control Advisory Committee

National Collegiate Athletic Association-Department of Defense (NCAA-DoD) Grand Alliance - Concussion Assessment, Research, and Education (CARE) Consortium Scientific Advisory Board

National Institute of Neurological Disorders and Stroke, Common Data Elements - National Board Steering Committee

Telemedicine and Advanced Technology Research Center, Panel Member Trauma and Resuscitation Technology

U.S. Army Medical Research Material Command, Combat Casualty Care Directorate, Expert Panelist Neuroprotection Review and Analysis

JOURNAL REVIEWERS

Annals of Sports Medicine and Research

Archives of Clinical Neuropsychology

Archives of Physical Medicine and Rehabilitation

British Journal of Medicine and Medical Research

European Journal of Neurology

Frontiers in Neuroscience

Institute of Electrical and Electronics Engineers (IEEE) Transactions on Medical Imaging

International Journal of Nonlinear Dynamics in Psychology and Life Sciences

Journal of Athletic Training

Journal of Cerebral Blood Flow and Metabolism

Journal of Magnetic Resonance Imaging

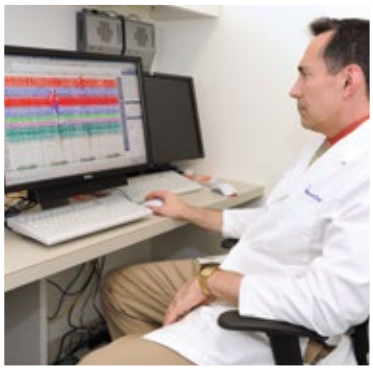
Journal of Neuroengineering and Rehabilitation

Journal of Neurosciences in Rural Practice

Magnetic Resonance in Medicine

NeuroImage

NMR in Biomedicine



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