

WALTER REED  
NATIONAL MILITARY  
MEDICAL CENTER



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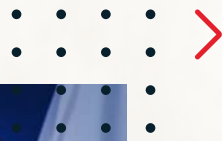
# EXCELLENCE IN CARE, INNOVATION IN ACTION



ANNUAL REPORT



THE NATIONAL INTREPID  
CENTER OF EXCELLENCE



# LETTER FROM THE DIRECTOR



## Dear Colleagues,

Since arriving at the National Intrepid Center of Excellence (NICoE) last summer, it has been a whirlwind of amazement and pride to be able to work with those who support NICoE's critical mission.

In 2024, the NICoE continued to excel in the delivery of patient-centered, interdisciplinary care to service members and veterans with TBI. Our efforts have been recognized across multiple fronts, most notably by our patients, who regularly share testimonials that our compassionate holistic approach heals warfighters and helps them overcome stigma and the challenges of moral injury.

One of the NICoE's greatest strengths is the partnership between our clinical services and research, which ensures that we are on the forefront of delivering high quality, compassionate care informed by the most recent data. In 2024, we launched the groundbreaking clinical Family Wellness Program (described on page 5), which was developed based on research demonstrating that family wellbeing impacts service members' recovery from TBI. The research underpinning the FWP was conducted through our collaboration with the Traumatic Brain Injury Center of Excellence on the Congressionally-mandated 15-year Longitudinal TBI Study.

In 2024, we were also pleased to receive funding to establish a blast exposure research database and apply advanced machine learning algorithms to more precisely identify the impact of blast exposure on brain health. Our researchers continue to lead, including in developing better understanding of the relationship between posttraumatic stress symptom severity and neurobehavioral functioning, as well as exploring how novel neuroimaging and blood-based biomarkers can predict long-term brain health outcomes.

In response to events at some U.S. military and diplomatic posts at home and abroad, the NICoE has also become a designated place of care for individuals reporting Anomalous Health Incidents (AHIs). Due to our unique footprint and organization, we are well-positioned to provide excellent clinical care for those affected by AHIs, conduct new research to improve the quality of life for those impacted, and contribute to understanding in this area.

We also marked another milestone for the Defense Intrepid Network (DIN), with the final Intrepid Spirit Center in Fort Bliss, Texas opening its doors in September.

This year's success was made possible due to the dedication of NICoE staff: our skilled clinicians, nurses, Navy hospital corpsmen, clinical researchers, and administrative teams. With the support of all of our partners, NICoE is well-positioned to lead the charge in delivering unparalleled care to those who serve – in 2025 and beyond.

Sincerely,



**Shannon C. Ford, MD, COL, MC**

Director, National Intrepid Center of Excellence  
Walter Reed National Military Medical Center



## OUR MISSION

We improve the lives of patients and families impacted by traumatic brain injury through excellence and innovation.



## OUR VISION

To be a global leader in TBI care, research, and education



## GUIDING PRINCIPLES

Excellence, Innovation, Compassion, Collaboration, Honor



The National Intrepid Center of Excellence (NICoE) stands at the forefront of advancing traumatic brain injury (TBI) treatment and brain health within the Military Health System (MHS). Through excellence in TBI clinical care, research, and education, we improve the lives of service members with TBI and other invisible wounds of war and ensure that they are able to return to service. The NICoE's interdisciplinary care model delivers patient-centered services that meet the whole person needs of warfighters. Our healthcare professionals work together across twenty disciplines to address the physical, emotional, psychological, and social needs of our patients. Furthermore, by educating and engaging families in patients' TBI care, NICoE's Intensive Outpatient Program fosters understanding and a positive home environment for sustained recovery. We continue to learn from our patients, our research, and our colleagues to continuously reinvent and refine how we deliver the best care possible.

## CLINICAL SERVICES

As a directorate of the Walter Reed National Military Medical Center, the NICoE has the unique mission of providing comprehensive and compassionate care to service members, veterans, and other beneficiaries affected by TBI through its state-of-the-art interdisciplinary program. The NICoE offers patients 20 specialties, all collocated in one building, to optimize recovery and improve quality of life.

The full-spectrum of high-quality care is provided through one of two programs:

- **The Intensive Outpatient Program (IOP)**, a four-week coordinated patient schedule with individualized treatment plans focuses on specialized medical care, education, and mind-body wellness for patients with a history of TBI and other invisible wounds of war. Patients attend over 140 appointments in both individual and group settings in a compressed amount of time.
- **The TBI Outpatient Program** provides diagnostic evaluation, treatment, diagnoses, and follow-up care for TBI of all severities.



"NICoE (is) working like a well-oiled Special Operations Unit. The professionalism is astounding and the care we received is unmatched. Thank you!"

— From an IOP cohort



### CLINICAL SERVICES AND SPECIALTIES



#### BEHAVIORAL HEALTH

Psychiatry, Psychology, Social Work, Neuropsychology



#### MEDICAL SERVICES

Neurology, Neuro-optometry, Physiatry, Primary Care, Sleep Medicine, Sports Medicine



#### REHABILITATION AND WELLNESS

Audiology, Acupuncture, Animal Assisted Therapy, Creative Arts Therapies, Mind-Body Wellness, Nutrition, Occupational Therapy, Pain Management as part of comprehensive care, Physical Therapy, Speech-Language Pathology, Spiritual Wellness, Biofeedback



#### CLINICAL SUPPORT SERVICES

Advanced Diagnostics and Testing, Brain Fitness Center, Case Management, Referral Management, Medical Support, TBI Portal for Clinical Care Management, TBI Education and Training

*The NICoE's holistic approach includes a range of medical, behavioral health, rehabilitation and wellness, and related services.*

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4



**1,843**  
patients

*received  
services in*

**28,727**  
visits



**164**  
patients

*participated in  
the four-week IOP  
in a total*

**14,748**  
visits

*averaging*

**90**  
visits each

*Across the 13 sites that comprise the Defense Intrepid Network:*



**13,182**  
patients

*received  
services in*

**192,812**  
visits

## Pain Treatment

Centers for Disease Control and Prevention data indicate that military veterans aged  $\geq 20$  years old are more likely to have chronic pain than civilian nonveterans— 31.5% versus 20.1%. <sup>1</sup>

- To help warfighters with pain, the NICoE's care plan includes acupuncture, myofascial treatments, physical therapy, dance/movement therapy, yoga, and other treatments and modalities.
- NICoE has also expanded its relationship with the Walter Reed National Military Medical Center (WRNMMC) Pain Clinic. Stellate ganglion blocks (SGB) are offered as part of the NICoE treatment plan to address pain and chronic post traumatic brain disorder (PTSD) symptoms. NICoE is also working to expand access to care through WRNMMC's Telehealth Pain services.

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"I loved my time here and have recommended NICoE to everyone who's still active duty and will continue to do so after I leave."

— IOP patient

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## RESEARCH

NICoE researchers help deepen understanding of the effects of TBI and associated health conditions and support the translation of promising research into clinical practice across the MHS. Subject matter experts, researchers, and clinicians devoted to optimizing care for service members and veterans investigate TBIs, psychological health conditions, blast exposures, and therapeutic practices. Working in collaboration with partners across the MHS, the Department of Veterans Affairs, and academia, NICoE's studies focus on enhancing clinical care and optimizing long-term rehabilitation and military readiness. NICoE research supports the DHA mission and aligns closely with the Department of Defense's Warfighter Brain Health Research Strategy and the DHA TBI Strategic Plan.

## NICoE researchers submitted or conducted:



# 33

ABSTRACTS, ORAL PRESENTATIONS,  
AND POSTER SESSIONS



# 39

PEER REVIEWED PUBLICATIONS AND  
MANUSCRIPTS



# 1

BOOK CHAPTER

“

“...this program has provided us with tools and knowledge to continue serving the country and finding lifelong fulfillment. This program has undoubtedly changed our lives and set us on a track to heal...this is a very special program that is second to none anywhere else in the military...”

— From an IOP cohort

”





## Family Wellness Program

In July 2024, NICoE launched the Family Wellness Program (FWP), a novel clinical program to support the families of service members and veterans being treated in the IOP. The program was developed based on the findings of the Caregiver and Family Member Study – a component of the 15-year study described at right – which indicated that family members caring for service members and veterans with TBI often report poor quality of life across physical, psychological, social, caregiving, and economic domains. Caregivers' efforts are often invisible, and their needs go unmet. Moreover, service members' neurobehavioral symptoms both influence and are influenced by family distress. Addressing family distress has the potential to significantly improve warfighter recovery and readiness after a TBI.

The FWP integrates care for intimate partners in the last week of the four-week IOP. Staff provide clinical assessments and recommendations, information about treatment options, referrals, and community-based resources. Intimate partners participate in educational sessions and clinical visits with their partners to better understand their experience and support their recovery.

Due to the initial success of the FWP at the NICoE, Intrepid Spirit Centers (ISCs) at Fort Carson and Camp Pendleton plan to implement the program in 2025. Additional DIN sites are exploring incorporating the FWP in coming years. The program's successful implementation was based on years of research and demonstrates the strength of the DIN to translate promising research into clinical programs that improve the quality of life for service members and their families.

## TBI 15-Year Longitudinal Study

Congress passed the 2007 National Defense Authorization Act which called for a 15-year longitudinal study of the effects of TBI on members of the armed forces serving in Operation Iraqi Freedom or Operation Enduring Freedom. Under the Traumatic Brain Injury Center of Excellence's leadership, NICoE, along with other collaborators, worked on the Natural History of TBI and the Caregiver and Family Member studies. These studies examined questions relating to the physical and mental health effects of TBI, health care and rehabilitation needs, availability of long-term care and rehabilitative programs, and the impact on family members and caregivers. The research began in 2010, and a final report will be issued in 2025.

## The Caregiver and Family Study



**50+**

peer-reviewed  
publications

**50+**

conference  
presentations



## The Natural History of TBI study



**50+**

peer-reviewed  
publications

**153+**

conference  
presentations



## New Blast Exposure Initiative

Recent public and congressional interest has focused on the potential negative impact of low-level blast exposure from weapon systems on brain health. As a leader in this research, NICoE and collaborators obtained funding through the Medical Technology Enterprise Consortium to study the relationship between repeated blast exposure, and clinical and subclinical indicators of brain dysfunction. Data from military sources will be compiled into the new BLAsT injury clinical Threshold scale (BATTLE) database.

Artificial intelligence and machine learning will be leveraged to develop a deeper understanding of the impact of different levels of blast-related exposures. The BATTLE database will be a useful resource for developing more precise guidelines for blast exposure. It will also facilitate monitoring of the intensity and frequency of blast exposure during training and combat operations, based on measurable clinical markers. Clinical and operational recommendations will be developed based on findings.

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**All [providers] were amazing.  
Literally all of them. You can tell they  
care and are committed!**

— IOP patient

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## Imaging Capabilities

The NICoE maintains brain imaging capabilities, including magnetic resonance imaging (MRI). The NICoE routinely obtains imaging, including functional MRI, and diffusion- or perfusion-weighted images. Nearly 3,000 service members have participated in neuroimaging research at the NICoE through involvement in projects studying structural and functional changes in the brain after TBI, vascular dementia risk, the impact of sleep restriction, and more. The data collected through neuroimaging studies at the NICoE are paving the way for future collaboration with military, civilian, and academic partners— positioning the NICoE as a leader in cutting-edge neuroimaging biomarker discovery.

## Brain Fitness Center: Computer Based Cognitive Rehabilitation Database

Cognitive issues related to TBI or other causes can significantly impact a service member’s abilities and quality of life. The NICoE Brain Fitness Center provides computer-based cognitive rehabilitation tools which offer an important addition to the limited treatment options currently available. These tools are being studied in the military population for performance optimization, recovery from injury, and maintenance of cognitive function. The Brain Fitness Center research aims to improve understanding of computer-based cognitive rehabilitation tools through the development and use of a data repository of demographic information, cognitive assessments, self-report questionnaires, and variables describing the frequency and type of tools used.

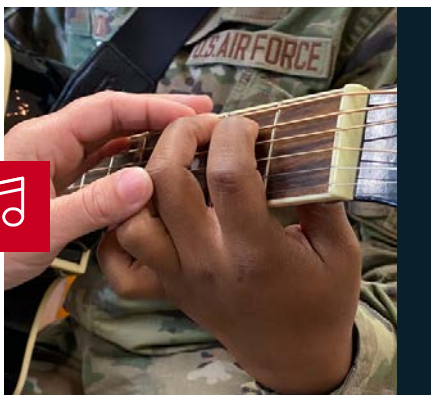




**3,100+**

**art , music, and dance/movement therapy clinical encounters for patients and their families**

Through a collaboration with the Creative Forces®: National Endowment for the Arts Military Healing Arts Network, some DIN sites embed creative arts therapists within their interdisciplinary clinical teams to promote the health, well-being, and quality of life for service members, veterans, their families, and caregivers. The NICoE received \$10 million in Congressional funding to improve understanding of the clinical impact of creative arts therapies and develop evidence-based guidelines for selected interventions and directives. Through a partnership with the Center for Deployment Psychology at the Uniformed Services University of Health Services, nine research projects were funded across DIN sites in 2024. Additional collaborators include the Department of Veterans Affairs, Drexel University, Towson University, the University of Florida, and the University of Pennsylvania.



## Creative Arts Therapies

The Creative Arts Therapies program at the NICoE plays a vital role in the interdisciplinary treatment of service members with TBI and psychological health conditions. At the NICoE, creative arts therapists deliver care through three distinct disciplines: art therapy, dance/movement therapy, and music therapy. Through individual, group, and family sessions, creative arts therapists assess functional and psychological needs, address trauma-related symptoms, and engage patients in creative processes that align with personalized treatment goals. These therapies provide both verbal and nonverbal pathways to care through intentional interventions, which help patients to process difficult experiences, gain insights, build resilience, and achieve treatment goals.





Distinguished visitors from the U.S. and international military, government, clinical, academic, and research entities visited the NICoE to learn about our innovative model of delivering TBI care.

## Top Reasons for Visits

- **Knowledge sharing** about TBI recovery and best practices
- **Understanding** NICoE programs
- **Communicating** about our interdisciplinary model for care

## Snapshot



### INTERNATIONAL VISITORS

delegations from Ukraine, Taiwan, Japan, and the United Kingdom



### U.S. MILITARY VISITORS

7 delegations



### ACADEMIC AND NONPROFIT ORGANIZATIONS

34 visitors representing five organizations



### MEMBERS OF CONGRESS AND STAFF

16 visitors

## TRAINING

NICoE staff trained healthcare providers in TBI-related care through:



**13** DIDACTIC LECTURES



**1** GRAND ROUNDS PRESENTATION

NICoE training covered a **range of topics**, such as:

- neuroimaging in TBI
- how virtual realities and other novel therapies can improve care for PTSD
- cognitive performance optimization after brain injury
- tinnitus
- the audiologist's role in TBI; acute concussion management
- long-term effects of TBI and blast exposure; concussion/TBI clinical phenotypes and
- the connections between orofacial pain, TBI, and PTSD



The DIN sites provide interdisciplinary care for TBI and other invisible wounds of war with support from the Intrepid Fallen Heroes Fund. This collaboration advances Congressional and Department of Defense directives and initiatives to maximize the DIN's ability to meet the needs of service members, veterans, and their families. In addition to the NICoE, the DIN includes 10 Intrepid Spirit Centers (ISCs) and two TBI Clinics outside the continental United States.



## Fort Bliss Intrepid Spirit Center Opening

The last planned ISC opened in Fort Bliss, TX  
in September 2024



## Looking Ahead with Purpose

In 2024, the NICoE continued our research to deepen understanding of TBI and brain health and translated findings to clinical practice to further improve our state of the art care. We prepared our warfighters to return to service quickly and ready to serve. Thank you to our stakeholders for your critical support. We look forward to continuing our mission with compassion and excellence.





## THE NATIONAL INTREPID CENTER OF EXCELLENCE

4860 South Palmer Road  
Bethesda, MD 20889

Phone: (301) 319-3710

For more information about NICoE, please visit our website:  
<https://health.mil/Military-Health-Topics/Centers-of-Excellence/NICoE>