

INTREPID VOICES

PUBLICATION OF THE DEFENSE INTREPID NETWORK FOR TBI & BRAIN HEALTH

A Story of Resilience - a Lt. Col.'s TBI Journey



*Lt.Col. Micheal Harrison
with his family.*

The NICoE's Intensive Outpatient Program (IOP) is a four-week program for active duty service members diagnosed with a traumatic brain injury (TBI). The treatment plan focuses on mind, body and spirit. Lt.Col. Michael Harrison was gracious enough to sit down with us to discuss his experiences with TBI and his experience with the IOP program.

NICoE: Tell us about your journey and what led you to the NICoE.

Lt.Col. Harrison: "I've been in the Army for 20 years. Over the course of that time, I was deployed overseas multiple times. I spent quite a bit of time in Afghanistan and I loved this Army journey. I love the people. I love the purpose, and I love the idea of service and being a part of a team, something greater than ourselves. What I came to realize is that I never really stopped to slow down and process. As I wind down my 20-year career, I'll be retiring in June, I have the special opportunity here at NICoE to really take some time to reflect on where I've been and what I've done. What I'm going through now I think can really help inform how I prepare for the future as a successful veteran, as someone who is continuing to give back and be much more of an involved and helping husband, father and contributor. NICoE has been one of those special opportunities for me. It's been a time to learn and reflect on my own emotional, physical, psychological scars and the journey I've been on. Through this incredible integrative medicine program they have here, I've been able to figure out how to align wellness with physical therapy, with nutrition, with mindfulness, with this idea of how to reframe what I've done in terms of how it informs my future. It's been a really cool place to be."

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March 2024 - Brain Injury Awareness Month



March is acknowledged by the Department of Defense as Brain Injury Awareness Month (#BIAMonth), dedicated to heightening awareness of traumatic brain injuries (TBIs) and enhancing the capability of health care providers to identify, manage, and treat service members and veterans impacted by TBIs. TBI, considered one of the signature wounds of war in the 21st century, presents complex and challenging problems for many service members. More than 485,000 service members have been diagnosed with a TBI since 2000 - 82.2% of which are categorized as mild TBI.

***A Story of Resilience - a Lt. Col.'s TBI Journey
Continued.***

NICoE: What can you tell us about your history with TBI?

Lt.Col. Harrison: "I spent quite a bit of time in Afghanistan. My first deployment was 2006-2007. I was in northeastern Afghanistan, up in the Kunar province, a pretty violent part of the country, and as a result we were a part of a lot of fire fights. Whether they were rocket-propelled grenades (RPGs) or they were our own fire fighting back at them, or enemy mortars, there were a lot of violent blasts that I was in close proximity to. And it's only by the grace of God that I'm here. We were there for about 16 months and over the course of that time we saw fire fights almost every other day. As a result, that cumulative effect that I didn't necessarily feel when I was 24 because I was young and healthy, as I've started getting older and older it's started catching up with me. In 2009 I was back in Afghanistan, and it wasn't the same intensity overall but there were periods of significantly intense fire fighting. I was blessed to come home. Not everybody did and there were certainly service members with much more serious injuries. But I think when I came home, I didn't process it and I never had the opportunity to seek as much medical attention as I would have liked while I was deployed. Because most of these exposures happened in the context of significant fire fights and missions that as a platoon leader and commander, those weren't situations that I could just pull away from and I didn't want to pull away from them, honestly. So coming back from that in 2010, that's when it started having much more of a pronounced effect on me: headaches, anxiety, anger issues, PTSD. But even then, I couldn't process it. I would block it. I would put it away. I would describe it as a hallway where you have all these doors and they're all just locked and compartmentalized. I would still have a short temper now and then. And I had a lot of sleep issues. But it wasn't until about two years ago when it all came to a head when I realized it was time for a new chapter in my life. I love the army but it was time for a new adventure for our family. I think that was the point in which I somehow gave myself permission to unlock the doors and let it all come out. It's been a lot of processing. The last two years have been really tough mentally for me and physically, specifically with headaches and lack of concentration and balance. All of that is a cumulative effect of this idea of emotional, psychological and physical, and how they all relate. My wife encouraged me to do this and that's how we really started this journey of self-reflection, self-assessment, understanding and the healing process."

NICoE: What were your expectations coming into the IOP program?

Lt.Col. Harrison: "I expected there to be world class doctors here. But I didn't understand how it all fit in together. I've just been amazed at how in touch everybody is. It's one team. It's clearly one integrated team that works together that loves each other and love this mission. It really is a special place to be."



Lt. Col. Harrison's art therapy mask that he created during his time in IOP at the NICoE. The bright colors depict important people and happy memories in his life, while the black specks represent the darker, challenging moments - including TBI.

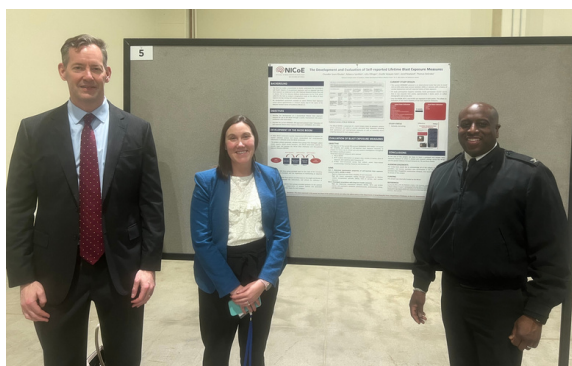
NICoE: How has your time at the NICoE been so far?

Lt.Col. Harrison: "This team is world class. I don't think there's anywhere else on earth like this with a team that has the heart and that has this shared purpose. They are incredible at what they do. What's most profound to me is how they tie in all the various aspects of interdisciplinary medicine from physical therapy, to neurology, to art therapy, to the pet [animal assisted] therapy, to nutrition. It's a very clear and deliberate approach towards how to align all the various domains of your life to optimize your health. It's OK to not be OK, but the goal is to help you get better and educate. This is an amazing team and I could not be more grateful to be here. And I'm only two weeks in, so I'm certainly excited for what's next."

The Defense Intrepid Network at the 2024 AMSUS

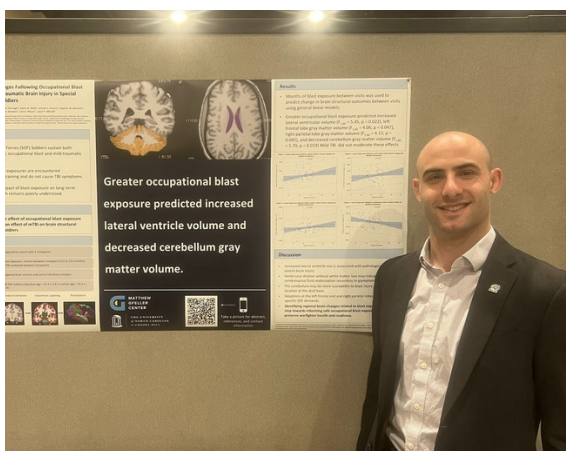
The Defense Intrepid Network presented several posters at the 2024 Annual Meeting of AMSUS, the Society of Federal Health Professionals, held at the Gaylord National Resort, National Harbor, Maryland, Feb. 12-15, 2024.

One study highlighted was a Cross-Walk Comparison of the DVBiC-TBiCoE and LiMBiC-CENC Combat-Related Concussion Prospective Longitudinal Study Datasets. The study described and compared cohorts from two large, longitudinal, federally-funded TBI studies (DVBiC-TBiCoE and LiMBiC-CENC prospective longitudinal studies) of service members and veterans across demographic, self-report, and neuropsychological variables. Their findings noted differences in demographics characteristics, military service branch, and symptom profiles. To find out more, [read here](#).



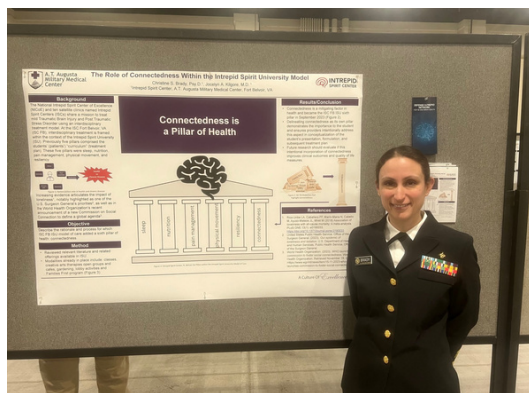
NiCoE at AMSUS - from left to right - Dr. Treven Pickett, research department chief; Dr. Chandler Rhodes, service chief of research, treatment and rehabilitation; and Capt. Carlos Williams, director of NiCoE.

NiCoE researchers also presented work on the development of a self-reported lifetime blast exposure measure called the NiCoE Blast Ordnance and Occupational Exposure Measure (BOOM), as well as a description of current research assessing the psychometric properties of the BOOM and other self-reported blast exposure measures. The goal of this line of work is to provide one or multiple psychometrically validated assessments that can be used to collect standardized lifetime blast information in the NiCoE and across the greater Defense Intrepid Network. To find out more, [read here](#).



NiCoE's Dr. Jake Powell presenting his study on "Neurostructural Changes Following Occupational Blast Exposure and mildTBI in special operation forces soldiers"

Another work showcased was the study that investigated the effect of occupational blast exposure and mild traumatic brain injury (mTBI) on brain structural changes in Special Operations Forces soldiers. Lower cerebellum gray matter and larger lateral ventricles were related to greater occupational blast exposure but not mTBI history. Identifying brain structures susceptible to blast exposure may inform safer occupational exposure levels and targets for clinical examination.



Lt. Cmdr. Christine Brady, director of the Intrepid Spirit Center at Fort Belvoir, presenting "Role of Connectedness within the Intrepid Spirit University Model"

A presentation on the "Role of Connectedness within the Intrepid Spirit University Model" was presented by the Defense Intrepid Network member, the Intrepid Spirit Center at Fort Belvoir. This poster presentation describes the center's interdisciplinary treatment model of the Intrepid Spirit University, where patients are "students" and providers are "teachers" imparting knowledge to assist the student in making lifestyle changes to address the presenting ailments of patients. This model of care reduces variation in the overall process while creating individualized patient care, and destigmatizes health care for patients with mild TBI and PTSD.

A literature review that examined current metrics being used to quantify job satisfaction was also presented. The literature identified that job title and responsibilities, professional relationships, and socio-economic factors all contribute to workplace satisfaction. The review concluded that more research is necessary to develop and validate a measure to capture workplace satisfaction with the military healthcare system with its unique barriers and challenges. Ultimately, identifying workplace satisfaction barriers may lead to better mitigation by management and thereby lessen employee turnover, prevent staffing gaps, and ultimately improve quality of patient care.

The Defense Intrepid Network staff gained valuable insight on DHA healthcare policy and current challenges, and prioritized networking opportunities to facilitate potential collaborations with other government agencies. Following the meeting, the NiCoE research department is focused on following up on connections made over the four days to initiate stronger organizational partnerships.

The Crucial Role of Military Family Caregivers

Highlights from the 15 Year Longitudinal TBI Caregiver Study

There are more than 40 million caregivers across the country who sacrifice to improve the quality of life for their loved ones. Military family caregivers are vital in supporting our armed forces and contributing to their mission. The month of November is National Family Caregivers Month, dedicated to celebrating service members' loved ones and recognizing their sacrifices in service to the country.



In 2006, Congress mandated that the DoD conduct a longitudinal study on the effects of TBI on service members returning from Operation Iraqi Freedom and Operation Enduring Freedom. The mandate also required conducting studies on the effect TBI has on the families of those injured. The Traumatic Brain Injury Center of Excellence, formerly the Defense and Veterans Brain Injury Center, started the 15 Year Longitudinal TBI Caregiver study in 2010. The National Intrepid Center of Excellence (NICoE) serves as the study's lead site. The study is now in its 13th year and will conclude in 2025.

The study looks at the health and service needs of family caregivers of active-duty service members or veterans who served after October 2001 and were diagnosed with TBI. Unsurprisingly, the challenges for caregivers aren't easy. The caregiver can be affected mentally, physically and financially.

"What we found is that a lot of people that are in that role are neglecting their health. They're in a lot of emotional turmoil. It feels as if their relationship is unsatisfactory. Some feel trapped," said Dr. Louis French, Deputy Director at the NICoE and principal investigator for the 15-year study.

A recent manuscript published from the [study](#)* looked at 290 caregivers from two programs within the U.S. Department of Veterans Affairs (Caregiver Support Program and General & Comprehensive Programs) as well as caregivers not enrolled in either of the VA programs. The study measured military family caregivers' health-related quality of life (HRQOL).

"Many caregivers reported clinically significant concerns across physical [sleep-related impairment and fatigue], psychological [anxiety, depression, perceived stress, general life satisfaction, and resilience], social [ability to participate in social roles and activities, social isolation, emotional support, perceived rejection, and companionship], and caregiving [strain, vigilance, feeling trapped, anxiety, feelings of loss, and military health care frustration] HRQOL domains," the study found.


Yet there are instances where there are positives to being a service member family caregiver. Dr. French notes that there are family caregivers who have not done poorly. Some feel the role has given them new emotional and psychological insights that have helped them feel fulfilled despite the challenges. "So, it's not all a sad story."

The wellbeing of caregivers and family members is a critical aspect of the patient centered interdisciplinary health care model implemented in the Defense Intrepid Network and its NICoE headquarters. The Intensive Outpatient Program (IOP) provides tailored treatment plans with patient, family, and provider input that focus on the mind, body and spirit. Patients learn self-management skills to increase resilience, manage symptoms, and enhance their well-being long-term. In the last week of the program, service members' families join so that they can better learn how to help their loved one in their recovery process. Caregiver support programs exist so that caregivers understand they are not alone and have support networks that can help them.

"If you're in a supportive family, you're more likely to have a better recovery from what happened to you," Dr. French said.

**Health Outcomes in Caregivers of Service Members and Veterans with Traumatic Brain Injury Enrolled in the U.S. Veterans Affairs Caregiver Support Program - Brickell, T. A., Wright, M. M., Sullivan, J. K., Varbedian, N. V., Byrd, A. M., French, L. M., & Lange, R. T.*

mTBI Associated with Lower Brain Network Resilience in Soldiers



The journal *Brain Communications* published an article providing evidence that graph theory measures of brain network resilience, but not efficiency, were lower in special operations forces soldiers with mild traumatic brain injury (mTBI) history compared to those without a history of mTBI.

Special operations forces (SOF) combat soldiers sustain frequent blast and blunt neurotrauma, most often classified as mild traumatic brain injuries. Between 2000 and 2020, the Traumatic Brain Injury Center of Excellence reported 430,720 TBI diagnoses among the U.S. Armed Forces, of which 354,991 (84.4%) were classified as 'mild.' Given the growing reliance on SOF combat soldiers to intervene in global conflicts, brain injuries may be more frequent in this population, with 25–55% reporting mild TBI (mTBI) history in past studies. Despite the designation 'mild' in mTBI, service members can suffer longterm effects. Exposure to repetitive mTBI has been associated with persistent emotional, cognitive, behavioral and neurological symptoms later in life in some individuals. Research linking the physiological consequences following acute mTBI to chronic adverse brain health is needed. Advancements in graph theory and functional magnetic resonance imaging have offered novel ways to analyze complex whole-brain network connectivity.

The study - Mild Traumatic Brain Injury History is Associated with Lower Brain Network Resilience in Soldiers* - set out to determine how mTBI history, lifetime incidence and recency of TBI affected whole-brain graph theoretical outcome measures. This cross-sectional study utilized data collected over six years (2015–21) at the University of North Carolina at Chapel Hill. This study sample included 152 healthy, asymptomatic, male, SOF combat soldiers. All participants had clinically recovered from any prior mTBI at time of visit.

SOF soldiers with a history of mTBI injury had less resilient brain networks. This finding underscores a lack of physiological recovery from mTBI in patients who otherwise demonstrate clinical recovery. Less resilient brain networks may increase vulnerability to future brain injury and increase risk for accelerated age-related neurodegenerative changes.

To learn more, access the full journal article: [here](#)

- Jacob R Powell, Joseph B Hopfinger, Kelly S Giovanello, Samuel R Walton, Stephen M DeLellis, Shawn F Kane, Gary E Means, Jason P Mihalik

The Duality of a Combat Veteran

The lobby of the Intrepid Spirit Center at Camp Lejeune displays an important aspect of the Defense Intrepid Network's interdisciplinary care model - the very personal, healing and creative works of art that are part of the center's art therapy program. These works provide a "visual voice" to TBI patients using imagery, symbolism and metaphor to externalize emotions and experiences that they may not be able to express in words.

One project on display is a mask installation created by a U.S. Marine who reflects on an aspect of himself that he feels comfortable showing and another aspect he keeps hidden. Below is the creative work explained in the Marine's own words.

The dual masks best depict the dichotomy of my personalities, post combat experiences. While the gray mask, mute and somber in color, represents the lack of emotion and loss for expression, it is also partially exposing itself for fear of missing out on its surroundings. The reason it is not fully uncovered is due to the anxiety of being nude and vulnerable in its total weakness and flawed self-perception. This mask is centered inside a cell, unable to escape the realities of dejection and as a means of security, preventing anyone or anything from getting too close.

The yellow mask, bright and loud, is breaking out of the cell. This represents my humorous and boisterous outlook on life in general and is the outside shell presented to the public. Nothing can hinder or trap the joys of life, hence breaking out of the cell. As this represents my humorous side of life, this mask is also wearing a mask. The glasses, eyebrows, and nose are similar to the novelty masks worn by youths for many years. This is a mask amongst a mask.

When uncomfortable situations arise that are difficult to talk about, I find myself deflecting the conversation extensively through obnoxious behavior and comments just as a magician controls the viewers eyes to direct them away from the sleight of hand, allowing them to see only what I want them to see.

The umbilical cord serves two purposes. One is the obvious purpose of nourishment. The two personalities feed one another and need each other for survival. The second purpose is to serve as a tether between my personalities. If there was nothing limiting its advancement, one mask would get away from the other, leaving it exposed and defenseless. Without the other mask, there would be a lack of balance and an overwhelming sense of exposure, resulting in absolute self-destruction. These two masks serve their own very specific purposes. One cannot survive trapped in a cell nor can anyone thrive without being grounded. There must be reciprocity between the two in order to obtain peace and prosperity.



The artwork is a part of the Creative Forces: Healing the Invisible Wound of War digital exhibition.

Intrepid Spotlights

A Chat with our Animal Assisted Therapy Instructor



"I love seeing patients make genuine connections with the dogs, and their excitement to share that connection and everything they've learned with their families. It's also incredibly rewarding to see someone realize how much they could benefit from having a service dog of their own and being able to walk them through the process of applying for one."

Name: Cathlene Holloran

What do you do at NICoE? I teach patients how to train service dogs that will one day be paired with future veterans. While training we work on concepts of mindfulness, patience, and positivity that can be applied in their everyday life.

Interesting facts about your career: Before coming to NICoE, I worked as a professional service dog instructor and trained around 200 dogs to become service and facility dogs. I've placed facility dogs in hospitals across the Southeast such as Vanderbilt and Johns Hopkins.

What do you find rewarding working at NICoE?

This program combined many of my passions into one. I love being able to see the human-animal bond in action and seeing the change it brings to the patients here. I also love getting the opportunity to educate people on the differences between service, therapy, and emotional support animals. Service dogs are more than a vest and require years of training in order to be comfortable and confident in public as well as utilize their trained tasks to mitigate a disability.

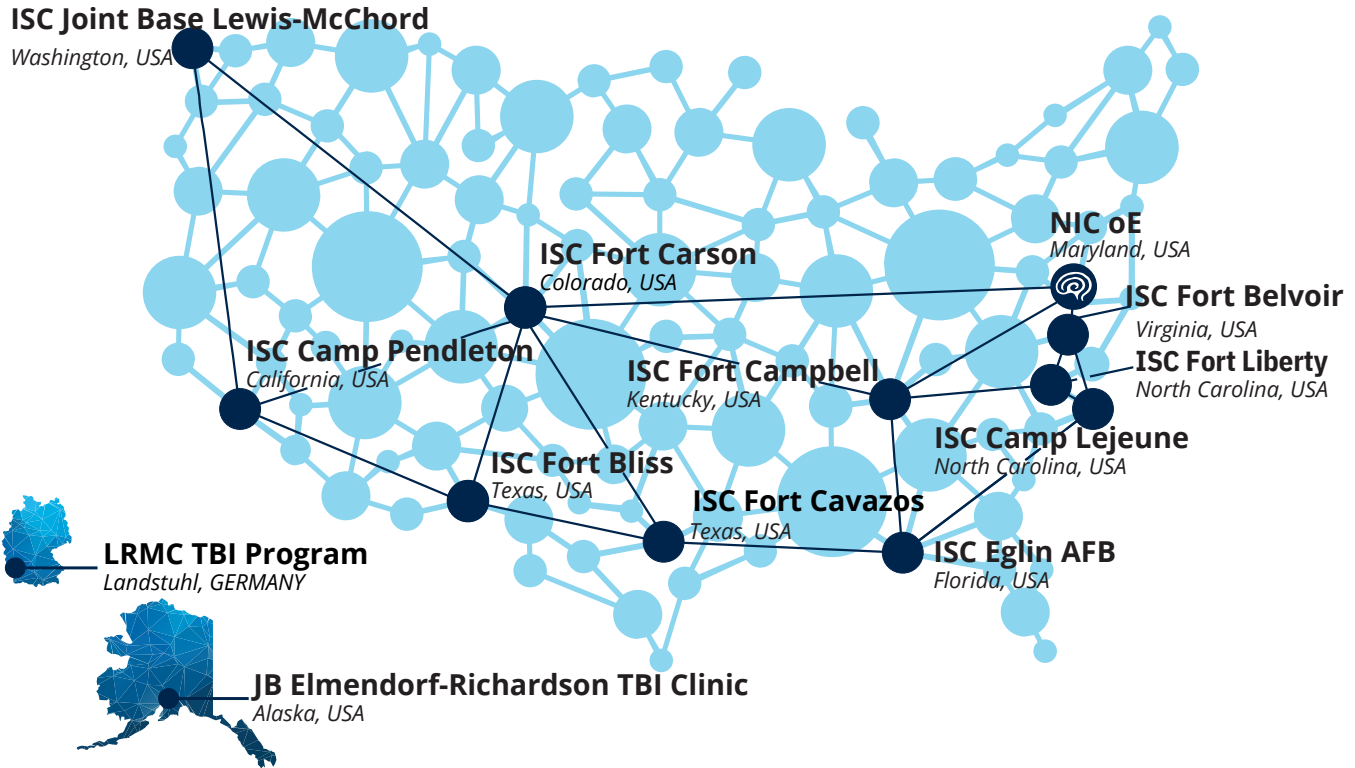
What is something people don't know about you?

I'm a big foodie! I love cooking and trying new cuisines and restaurants wherever I go.

“There's such great communication between the team of care providers. You mention something to your nurse then the art therapist brings it up in therapy. It's great that there's almost seamless communication between the team. I thought that was awesome.”

NICoE patient

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