

The background of the entire page is a photograph of three soldiers in camouflage uniforms climbing a large, dark rope net. The soldiers are positioned at different heights and angles, with one in the upper left, one in the lower left, and one in the lower right. The net is made of thick, dark ropes woven into a grid pattern. The background behind the net is a clear blue sky with some green foliage visible at the bottom. The image is framed by large, white, geometric shapes that create a modern, abstract design.

# CHAMP



**2024** Annual Report

## **Consortium for Health and Military Performance**

*Advancing Warrior Readiness  
and Human Performance*





*Advancing Warrior Readiness  
and Human Performance*

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# EXECUTIVE DIRECTOR'S LETTER

It's a privilege to lead CHAMP and guide our efforts in helping Warfighters meet the DoD mission worldwide. Through accomplishments in Human Performance Optimization (HPO) research, education, training, and leadership, we're supporting military readiness on multiple fronts.

We strengthened our leadership with the addition of CAPT Jeffrey Repass as Deputy Director and Elinor Harel as Director of Operations. Also, we congratulate Dr. Gabriel Paoletti on becoming the Director of Human Performance Resources by CHAMP (HPRC) and HPO Integration. Their leadership, alongside our dedicated subject-matter experts, researchers, and support staff, is instrumental in our aim to increase the performance and readiness of our military community.

CHAMP's educational initiatives remain a cornerstone of our impact as we increase collaborations and expand partnerships to advance HPO initiatives across DoD. Notably, over the next five years, the HPRC team will lead the development and delivery of essential HPO training for half of the U.S. military. The Operation Supplement Safety (OPSS) team expanded its mission to include the topic of performance enhancing substances (PES). They co-hosted the inaugural PES Summit with Major League Baseball, bringing together federal, military, and corporate stakeholders to address prohibited substance use. In addition, in the FY 2025 National Defense Authorization Act, Congress recognized OPSS as a critical educational initiative, commending the Secretary of Defense for driving its implementation across all military branches. Remarkable!

Our research teams are pushing the boundaries of what's possible across key domains of human performance. The Injury Prevention Research Lab is focusing on practical applications to reduce the risk of injuries in Service Members—one of the leading causes of lost-duty time and the top threat to military readiness—through key partnerships, innovative predictive models, and rehabilitation education for providers and Service Members. The Military Nutrition Environment team is providing technical support and consultation to the DoD community with recommendations to improve the DoD food program and an updated mNEAT app, a tool installations use to assess and improve their local military eating environments. The Psycho-Social-Spiritual fitness team continues to map individual- and team-based characteristics of human performance, focusing on measuring social and spiritual fitness—vital yet often overlooked components in Warfighter performance models. Publication of the Warrior Heat- and Exertion-Related Events Collaborative's "Clinical Practice Guideline for the Prevention, Diagnosis, and Management of Exertional Heat Illness" is set to save lives and ensure Warfighters' quick return to duty.

Looking ahead, CHAMP will remain steadfast in our core mission to enhance Warfighter readiness and performance. With the dedication of our talented team and the support of our invaluable partners, we'll continue to make a profound impact on the mission readiness of those who serve.

**Jeff Leggit, MD, CAQSM**

Acting Executive Director  
Consortium for Health and Military Performance



# CHAMP LEADERSHIP



**Jeff Leggit+, MD, CAQSM**

Interim Executive Director



**Francis O'Connor\*, MD, MPH, FACS**

Chief Medical Officer



**CAPT. J. Russell Linderman+, PhD**

Deputy Director



**LCDR Maile Richert+, PhD**

Interim Deputy Director



**Kyung "Nancy" Kwon, MSN, RN, CRNP**

Director of Research



**Gabriel Paoletti\*, EdD, MAPP**

Director of Human Performance Optimization (HPO) Integration and HPRC



**Sarah de la Motte\*, PhD, MPH, ATC**

Director of Fitness and Injury Prevention



**Andrea Lindsey\*, MS**

Director of Operation Supplement Safety and Senior Nutrition Scientist



**Gloria Park\*, PhD, MAPP, CMPC**

Director of Performance Psychology



**Ayanna Shivers\*, MPH**

Director of Strategic Communications



**Jonathan Scott\*, PhD, RD, CSSD, LD, FAND**

Associate Professor and Military Nutrition Environment Principal Investigator

\* Staff who have been with CHAMP more than 5 years

+ Staff with current or prior military service



# CHAMP TEAM

**Zina Abourjeily**, Clinical Research Coordinator II

**Daniel Abrams**, Scientist

**Misty Adams**, Technical Editor III

**Emma Alitz**, Research Coordinator

**Camila Almeida\***, Staff Scientist II

**Cindy Astorino\***, Senior Research Associate

**Amelia Barrett\***, Project Manager II

**Stephanie Barrientos**, Clinical Research Coordinator

**Maria Canino**, MSK Injury Research Scientist

**Stacy Cappadona**, Performance Dietician

**Francesca Cariello+**, Staff Research Nurse

**HaoPing (H.P.) Chai+**, Program Manager III

**Rachel Chamberlin\***, Senior Anthropologist

**Yifan Chen\***, Scientist

**Daniel Clifton\***, Research Scientist II

**Kristen Cofer**, Research Associate

**Micaiah Corley**, Education Specialist/Exercise Physiology

**Gabrielle Couture\***, Nutrition & Dietary Supplement Education Specialist

**Carolyn Dartt\***, Project Manager II

**Shannon Davi**, Health and Exercise Coordinator

**Yasmin Deausen**, Program Manager

**Patricia Deuster\***, Professor

**Elaine Dela Peña**, Digital Multimedia Content Specialist

**Alana Solomon-Dodson**, Clinical Research Assistant II

**Daniel Edgeworth\***, Data Manager 2

**Anne-Marie Feinkeng**, Research Assistant

**Jacqueline Forster**, Nutrition & Dietary Supplement Education Specialist

**Liam Friel**, Research Coordinator

**Alexandria Gregory**, Clinical Research Associate II

**Timothy Gribbin\***, Clinical Research Associate III

**Alaina Hansom**, Social Fitness Scientist II

**Hannah-Laura Henderson**, Senior Health Communications Social Media Specialist

**Tiana Hertenstein**, Clinical Research Associate II

**Sarah Hinman+**, Clinical Research Associate III

**Brittany Hollis**, Research Associate II

**Duy 'Zoey' Hua**, Dietary Supplement/Performance Enhancing Substances Education Specialist

**Tammy Irelan\***, Digital Manager

**Ginnefine Jalloh**, Social Media Specialist

**Joshua Kazman\***, Biostatistician III

**Jessica Kegel\***, Biostatistician III

**Saachi Khurana**, Research Coordinator

**Katie Kirkpatrick\***, Military Nutrition Environment Project Manager

**Carolyn Kleinberger**, Research Associate I

**Basil Lilien**, Project Coordinator

**Michael Lindow**, Bioinformatics Research Associate III

**Rory McCarthy\***, Anthropologist

**Maria McConville+**, Senior Nutrition Health Educator

**Beth McNally\***, Program Manager III

**Lauren Messina\***, Scientist III

**Christiane Minnick\***, Senior Graphic Designer

**Chris Niewinski\***, Multimedia Education Specialist

**Corey Pegues**, Health and Exercise Coordinator

**Maureen Purcell**, Biostatistician II

**Melissa Reichley\***, Senior Technical Writer/Editor

**Mingqiang Ren\***, Research Scientist II

**Emily Ricker\***, Scientist II

**Melissa Rittenhouse\***, Associate Professor/ Nutrition Scientist

**Deborah Robinson+**, Senior Nutrition Environment Administrator

**Kierra Sarfo-Kantanka**, Program Manager

**Nyamkhishig Sambuughin\***, Senior Scientist

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**Jill Smith**, Registered Nurse II

**Michael Smuda**, Program Manager I

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**Sahaja Surapaneni**, Mental and Spiritual Education Specialist

**Gia Torpey\***, Senior Editor

**Whitney Tramel**, Senior Health Education Administrator

**Stephanie Van Arsdale\***, Health Educator Associate

**Lindsay Vander Molen\***, Project Manager III

**Joshua Waters-Jackson+**, Certified Athletic Trainer

**Tianzheng Yu\***, Research Scientist II

\* Staff who have been with CHAMP more than 5 years

+ Staff with current or prior military service



# MISSION & VISION

The Consortium for Health and Military Performance (CHAMP) is the leading Department of Defense (DoD) resource for improving human performance in the military. The mission of CHAMP is to enhance Warfighter readiness through evidence-based Human Performance Optimization (HPO) knowledge, guidance, and operational support.

CHAMP continues to be the premier DoD readiness resource for HPO across the Total Force Fitness (TFF) domains in support of DoD operations. CHAMP effectively identifies HPO gaps relevant to the military by serving as the primary resource for answering questions and translating research, military operational applications, practical warrior clinical concerns, and DoD policy development.

CHAMP strives to expand HPO collaborations with federal partners, combining efforts to enhance the performance and resilience of Service Members and their families.

CHAMP actively seeks opportunities for new HPO initiatives and works closely with stakeholders to drive cutting-edge research, develop relevant curricula and educational materials, produce targeted trainings, and conduct innovative outreach. These efforts, including summits and digital campaigns to promote CHAMP HPO content, broaden our engagement with those supporting America's defense.

These collaborations are instrumental in strengthening our programs, demonstrating our impact, and expanding our reach throughout DoD.







# CHAMP 2024 ACCOMPLISHMENTS

## Human Performance Resources by CHAMP (HPRC)

The HPRC team of scientists and specialists translate research into evidence-based resources to help Service Members and their families optimize their performance and reach total fitness. HPRC also provides operational support for training Service Members on mission-critical human performance skills.

The HPRC team was selected to develop and deliver extensive Holistic Human Performance curricula and training for half the U.S. Armed Forces over the next five years. In an effort to help Service Members be mission-ready at all times, HPRC Holistic Human Performance trainings focus on five key domains: physical, spiritual, mental, sleep, and nutrition, including practical tips to maximize all areas of performance and readiness. Plans to continue these efforts include development of a new HPO training section on HPRC-online.org to highlight the available training and resource packages.

## U.S. Coast Guard (USCG) Resilience Coordinator Education

USCG contracted HPRC to develop and deliver the “Resilience Coordinator and Unit Education (ResCUE)” course over five days. The train-the-trainer course focused on eight content areas (primary prevention, behavior modification and theories of change, nutrition, physical fitness, sleep, stress optimization, nicotine cessation, and ResCUE course facilitation), taking a holistic Total Force Fitness approach to wellness, health, and performance. The HPRC team developed nearly 32 hours of content with more than 1,700 pages of teaching aids, including a comprehensive facilitator guide, testing and certification materials for Resilience Coordinator qualification standards, an assessment to ensure future trainers adhere to the curriculum, and a student course survey. We conducted ResCUE training for 150 Sentinels in Petaluma, California, Yorktown, Virginia, and Clearwater, Florida. The team also provided support for two USCG-led trainings in Boston, Massachusetts, and Almeida, California, to ensure content fidelity and provide quality assurance as the program grows. USCG and USU-CHAMP executed a five-year interagency agreement for HPRC to continue providing support for the USCG Resilience Coordinator program.



**32**  
hours of content



**+1,700**  
pages of teaching aids



### U.S. Army Holistic Health and Fitness Advisor (H2F-A) Curriculum Development

This project is a new effort for the HPRC team to create a holistic and comprehensive education curriculum for training H2F Advisors. Students will earn the new H2F-A special qualification identifier, enabling them to be the voice of human performance, integrated at the Army Brigade level. Each advisor will function as a liaison between established H2F Integrators (trainers), the unit, and the embedded human performance team. The HPRC team will train and support approximately 1,100 advisors across Army brigades at several military installations over the span of the project. The curriculum will integrate evidence-based resources from HPRC subject-matter experts with U.S. Army Training and Doctrine Command standards. The curriculum also will include in-person and distance learning modules on the domains of sleep, mental, spiritual, nutritional, and physical fitness. This project aims to enhance the health and readiness of the Army by training H2F Advisors with evidence-based findings and practical solutions to ensure engagement, follow-up, and application across the Force. Accomplishments in 2024 include conducting a site visit to the H2F Academy to assess the H2F-I course and gather feedback for curriculum development,

onboarding the H2F-A development leadership team, and refining the H2F-Advisor curriculum to ensure it's aligned with the needs of H2F professionals. The initial training pilot is scheduled for summer 2025.

### U.S. Space Force (USSF) Holistic Health Approach (HHA) Curriculum and Training

The HPRC team secured a contract with USSF to create a human performance skill-building curriculum package to improve individual and unit readiness. The HHA curriculum covers 12 human performance topics, including nutritional fitness, physical fitness, cognitive performance, and sleep health, and focuses on equipping Guardians with skills to enhance protective factors and encourage positive behaviors. The HPRC team is building a comprehensive tool kit with self-assessment, habit-building, and customized Total Force Fitness tools. We will deliver a five-day training course to teach USSF Guardian Resilience Teams of health professionals how to implement these tools with other Guardians. The curriculum will be integrated into HHA programs at nine bases and multiple USSF professional military education courses with the ultimate aim to serve more than 14,000 military and civilian Guardians.



The first cohort of newly trained Resilience Coordinators at Training Center, Petaluma. U.S. Coast Guard photo courtesy of the Integrated Primary Prevention Program.



## U.S. Air Force Training

The HPRC team has been instrumental in supporting the Air Force through extensive training initiatives aimed at enhancing readiness and resilience. Notably, the team led a full-day Airman Resiliency Team Summit for the 363d ISR Wing, fostering collaboration and skill development among personnel. HPRC also conducted specialized training for the Headquarters of the Department of the Air Force and delivered an intensive three-day training program for the 214th Attack Squadron's Unmanned Aerial Vehicle teams, addressing the unique challenges faced by these critical units.

## Website Update

HPRC-online.org is undergoing a redesign to enhance the user experience and gather meaningful feedback to guide future content development. The updated site will be more intuitive, user-friendly, and optimized for mobile devices. As part of this refresh, HPRC updated our feedback questions to better understand how users apply the content in their own lives and in helping others. The site also will allow users to share qualitative feedback about its impact. These upgrades are scheduled for completion in spring 2025.

## Increased USU Collaborations

The HPRC team strengthened connections within the Department of Military and Emergency Medicine (MEM) and expanded collaborations with USU faculty to advance HPO and TFF initiatives for America's future military doctors, nurses, and health professionals. Activities included presenting to students during Operations Gunpowder and Bushmaster; training on topics such as sleep, fatigue management, and nutrition; and partnering with MEM faculty to facilitate

their annual offsite meeting and develop resilience-focused curriculum for a prolonged casualty care course with Ukrainian participants. We also initiated collaborations with USU's Preventive Medicine and Biostatistics department to develop a Health and Human Performance course and worked with the College of Allied Health Sciences to explore course credits for the H2F-A project.

## Content Development

More than 2,100 pages of HPO content were created, tailored to the needs of Service Members, their families, military Service providers, and other DoD stakeholders. These resources included Service-specific training materials, comprehensive tools and guides, and engaging articles and blog posts.

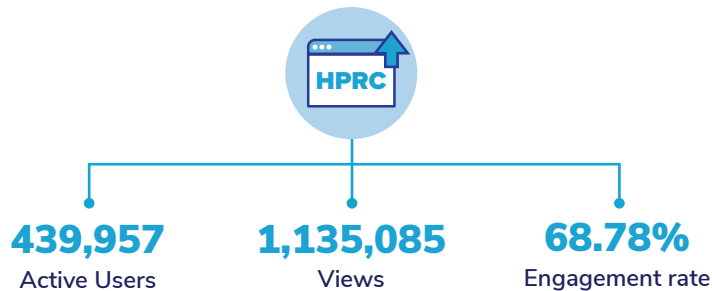
## Improved Program Evaluation

In an ongoing commitment to effectively deliver the highest quality content, the HPRC team implemented changes to our program evaluation efforts to gain a more comprehensive understanding of the impact of our website content, curricula, and training. New training pre- and post-tests were developed to measure knowledge gained and changes in attitude, intention, and confidence. End-of-article Likert scale questions were introduced to HPRC-online.org content to gauge participants' perceptions of content impact and its applicability to their lives and others, alongside prompts for qualitative feedback. HPRC also submitted an InterAgency Agreement for funding to the USCG to support data collection via REDCap to measure Resilience Coordinator utilization and potential effectiveness.





## Website metrics



## Most viewed HPRC content



**34,645**

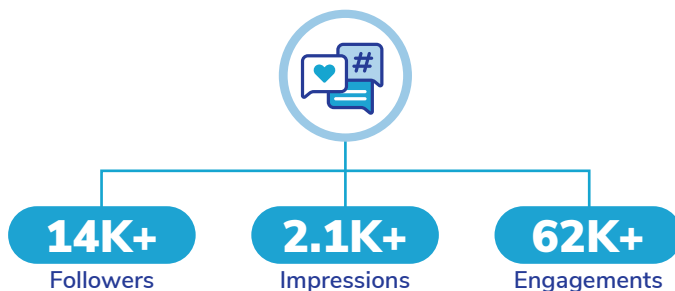
Materials downloaded from the website



**21,839**

Materials printed from the website

## Social media metrics



## HPRC Key Metrics



**120** Training presentation hours delivered



**41** HPRC website articles and blog posts



**33** HPRC graphic products



**3** Conference presentations



**2** Podcasts



**13** Recorded Webinars



**53** Evidence-based answers to Ask the Expert questions



In 2024, the HPRC team presented to audiences at the following:

214th Attack Squadron	Human Performance Optimization Summit
363 ISRW's Airman Resiliency Team Summit, Arlington, VA	Iowa National Guard
American Psychological Association	Kansas Army National Guard
American Psychological Association Division 19 (Society for Military Psychology)	National Guard Professional Education Center
Army Division Surgeon General	Sports Medicine Fellows, Ft. Belvoir, VA
Defense Threat Reduction Agency	Traumatic Brain Injury Center of Excellence
Directorate of Prevention, Resilience, and Readiness	U.S. Coast Guard
Force Fitness Instructors Course	USCG, Clearwater, FL
Fort Leavenworth, KS	USCG members, Hanscom AFB
Fort Myer for the Old Guard, Arlington, VA	USCG Office of Work-Life Programs
Headquarters of the Department of the Air Force, Pentagon	USCG Training Center, Petaluma, CA
Holistic Health and Fitness (H2F) Symposium, Hampton, VA	USCG Training Center, Yorktown, VA
Human Performance Optimization (HPO) Conference at Georgia Southern University	U.S. Space Force Major Commands
	USU Bushmaster Students
	USU Gunpowder Students
	USU School of Medicine





## Injury Prevention Research Lab (IPRL)

The Injury Prevention Research Lab is focused on the prediction and prevention of musculoskeletal injuries (MSK-I) in Service Members, and improving musculoskeletal injury and rehabilitation education for primary care providers. The musculoskeletal research team conducts a wide variety of projects addressing various aspects of MSK-I in Service Members.

### Effects of a Targeted Injury Reduction Program at U.S. Marine Corps West Coast Entry-level Training (RITE-TRACC II)

The RITE-TRACC II study aims to identify barriers to prompt MSK-I reporting in Marine trainees and their instructors at Marine Corps Recruit Depot—San Diego (MCRD-SD) and School of Infantry—West (SOI-W). In 2024, we finished enrolling recruits and Marines to assess the impact of 1) a targeted injury-prevention education curriculum (IPEC) intervention and 2) an embedded certified athletic trainer (AT) intervention at SOI-W on care-seeking, MSK-I rates, training outcomes, and MSK-I reporting. The study team transitioned the IPEC content to the SOI-W Sports Medicine Injury Prevention ATs and Infantry Training Battalion staff. In addition, the embedded AT provided care and injury prevention briefings, led active recovery sessions, and provided MSK-I “sick calls,” evaluating and treating a wide array of injuries at various training events. Embedded AT duties were transitioned to the Sports Medicine Injury Prevention ATs, emphasizing the strategies that were found successful as part of the AT intervention.

Accomplishments include:

- Developed and transitioned Injury Prevention Education Curriculum for SOI-W Infantry Training
- Demonstrated effectiveness of embedded athletic trainer during Infantry Training
- Gave two oral presentations at the Military Health System Research Symposium (MHSRS), two oral presentations at the National Athletic Trainers' Association Annual meeting, and one poster presentation at MHSRS

Surveyed **2,000+** recruits and Marines, including 109 drill instructors and 43 combat instructors



### **Hormonal Contraceptive Use and Stress Fracture among Early Career Service Members**

This is a retrospective study designed to assess the association between different routes of hormonal contraception administration and stress fracture (SFx) incidence among early-career female Service Members in the first six and 18 months of service. In 2024, we received additional funding to expand the study to assess hormonal contraceptive use in association with all musculoskeletal injuries in early career female Service Members. A manuscript on "Hormonal Contraception and Medical Readiness for Female Service Members" was published in the American Journal of Obstetrics and Gynecology.

### **Predicting and Preventing Back Pain in Aircrew**

This study aims to use the Conity system, a novel device from the Ohio State University Spine Research Institute, to characterize spine kinematics in military aircrew. Working closely with naval aeromedical safety officers to obtain command support and coordinate data collections across DoD sites, we obtained command support and approval for data collection at multiple aviation sites in 2024, including 3rd Marine Aircraft Wing and Joint Base Andrews, and we screened 85 aircrew. The team will continue to collect data in 2025 combining kinematic data with health-questionnaire data to explore factors related to self-reported low back pain. We also will use these findings to develop a low back pain prevention and wellness program to be delivered to aviation units.

### **Musculoskeletal Health Experiences Among Active Duty Service Members**

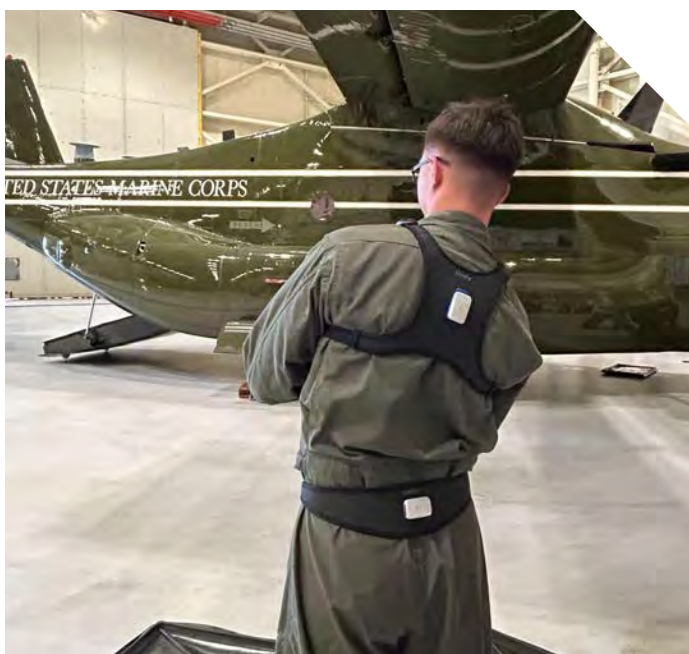
This qualitative research study aims to develop a more comprehensive understanding of MSK health among active-duty Service Members (ADSM) during their military careers. We plan to conduct 60 semi-structured interviews with ADSM to gather perspectives about perceptions of DoD services through the Military Health System, barriers and facilitators to maintaining MSK health, and patterns of seeking care for MSK injury and pain. In 2024, the IRB protocol was approved, we began recruiting and data collection, and we conducted 18 interviews.

### **Evaluation of U.S. Army Master Fitness Trainer Utilization to Mitigate Musculoskeletal Injury and Enhance Soldier Physical Readiness**

This study is a collaboration with the U.S. Army Research Institute for Environmental Medicine and the U.S. Army Holistic Health and Fitness Academy. The aim is to assess the current distribution of Army Holistic Health and Fitness Integrators (H2F-I), formerly called Master Fitness Trainers, and to determine the relationship among the density of H2F-I, musculoskeletal injury (MSK-I) outcomes, and physical readiness indicators. We will also characterize the technical (i.e. knowledge retention) and non-technical (i.e. individual- and team-based characteristics) skills of H2F-I and examine their associations with MSK-I outcomes and physical readiness indicators. We submitted for IRB approval in 2024. Data collection is scheduled to begin in 2025.

### **Wearable Spine Health System for Military Readiness Assessment**

The IPRL team is working with the Ohio State University Spine Research Institute and the Air Force Research Laboratory to characterize and explore the utility of the Conity system to longitudinally assess low back and neck function in active-duty Service Members. We have recruited subjects across USU, Walter Reed National Military Medical Center, Alexander T. Augusta Military Medical Center, Marine Corps Base Quantico, and Joint Base Andrews. We got consent from and screened 69 participants in 2024. The study will end in Sept 2025.







### Comprehensive Health and Musculoskeletal Prediction, Intervention and Optimization (CHAMPION)

The CHAMPION team partners with the Office of Women's Health, Department of Veterans' Affairs (VA) through a Joint Incentive Fund award. The goal is to create a shared VA/DoD last round of analytical infrastructure. This allows the team to develop predictive models for active-duty Service Members' and Veterans' health status as a function of their DoD administrative and health data, with a focus on how MSK-I and chronic pain impact well-being. Findings from these predictive models will be translated into individualized reports to inform active-duty Service Members and Veterans of their likely future health risk and status. Qualitative and quantitative feedback will be assessed on the format of the reports (e.g., verbiage, design) and Service Members' experience with MSK-I to ensure the information is useful for active-duty Service Members, Veterans, and providers. In 2024 we received IRB approval to obtain qualitative feedback on the format of individualized reports. We also collected survey data on 6,505 individuals participating in development of a Total Force Fitness Survey/Physical Fitness Scale to validate relevant self-report metrics. Participant recruitment will begin in 2025.

### Musculoskeletal and Associated Behavioral-Related Outcomes (MSKBH)

The MSKBH project team aims to mine big data sources throughout DoD to compile a data set in order to characterize the overlap between behavioral health and MSK conditions. Data variables include both epidemiological/disease burden and treatment-and-prognosis perspectives. The team is investigating the interrelationships among back pain, other MSK conditions, and the of behavioral symptoms. Our team compiled key data variables in 2024. We intend to publish on this effort and investigate additional topics in 2025.

### Active Duty and Veterans' Musculoskeletal Management and Enhancement Program (ADVet HOMME)

Funded through a Joint Incentive Fund in partnership with the Dayton VA Medical Center (VAMC), the objective of ADVet HOMME is to introduce efficient, standardized, and innovative training for common MSK-I for DoD and VA primary care providers and virtual care delivery practices for referred participants. The ADVet HOMME platform features CHAMP's Rehab, Refit, Return to Duty (Rx3) mobile app for a self-guided, at-home, four-phased rehabilitation program that helps resolve common MSK-I. In addition, both DoD and the VA have a team of health and exercise coordinators who work with participants, providing rehabilitation guidance, education, and resources, and setting expectations and goals for each Warfighter. In 2024, the team conducted three MSK education training sessions, bringing the total number of primary care providers trained on MSK assessment skills for the shoulder, back, hip, knee, and ankle to more than 100. In a significant step, Dayton VAMC established a new agreement with Wright-Patterson Air Force Base, creating a direct referral pathway to the Dayton VAMC. The team presented a program overview poster at the Association of Military Surgeons of the United States (AMSUS) conference.

## Focus on Rehabilitation of Musculoskeletal Injuries from Training (MSK3C)

In 2022, the Defense Health Agency (DHA) funded an integrated effort among three USU research programs—Musculoskeletal Injury Rehabilitation Research for Operational Readiness (MIRROR), CHAMP, and the Center for Health Services Research (CHSR)—to address deployment-limiting MSK conditions. CHAMP leads multiple efforts on this larger project focused on describing and assessing current MSK-I prevention practices within the military.

### **Musculoskeletal Injury Prevention: A Holistic and Big Data Approach**

The goal of this sub-study is to identify and validate evidence-based best practices for primary, secondary, and tertiary MSK-I prevention across DoD using a holistic and big data approach. To achieve the study goal, we leverage existing relationships with stakeholders in DoD to identify and validate practices for reducing the presence and burden of MSK-I among Service Members. We then develop evidence-based recommendations for mitigating the incidence and burden of MSK-I across DoD. In 2024, we evaluated associations between the onset of the Army Combat Fitness Test (ACFT) and MSK injury in Basic Combat Training in order to determine whether additional efforts are needed to reduce the burden of MSK-I in training as the ACFT becomes the official physical fitness test of record for the Army. We are in the process of re-establishing access to administrative, medical, and readiness data systems to continue working toward our goal.

### **Identifying Keys to Successful Human Performance Program Implementation to Improve Guardian Readiness**

The goal of this new sub-study is to explore utilization of and interdisciplinary referral patterns by U.S. Space Force Guardian Resilience Teams (GRTs). We will assess Guardians' perceptions of health and fitness, as well as perceptions of the role of GRTs and other holistic health programs in preserving health and fitness. In addition, perceived facilitators/barriers to seeking out resources to improve health and performance (including GRTs, specifically) will be identified. Results from this study will inform strategies for effectively engaging with Guardians to improve health and readiness. In 2025 the study team will finalize study goals and objectives with the U.S. Space Force Holistic Health Approach program (which oversees the GRTs), obtain administrative approvals, and begin data collection and analysis.

## Hormonal Contraceptive Use and Stress Fracture Risk

The goal of this sub-study is to build upon our existing Hormonal Contraception study to assess whether incidence and recurrence of stress fracture at different anatomical sites (e.g., femoral neck, tibia) vary based on the type of hormonal contraceptive someone uses. Our findings could directly impact clinical guidance for hormonal contraceptive choices among female populations at heightened risk for stress fracture.

### **Improving Musculoskeletal Care for Active-Duty Service Members through Primary Care Provider Education and Holistic Self-Guided Rehabilitative Care**

The goal of this sub-study is to deliver a provider-focused MSK-I curriculum encompassing hands-on MSK-I assessment techniques for the back, hip, knee, ankle and shoulder to DoD clinicians—from the enlisted level to graduate students, physicians, nurse practitioners, and physician's assistants. We have conducted multiple training events with Army Medics at "The Old Guard" in Ft. Myer, Virginia, and with USU Graduate School of Nursing Family Nurse Practitioner students. We will continue the MSK training events over the next year while adding new sites at DoD installations. We will also administer surveys to assess provider confidence in their skills pre- and post-training events.

### IPRL Key Metrics



**4** Oral presentations



**2** Posters



**3** Trainings



**1** Publication



**1** Review article



**1** Letter to the editor



## Rx3

The Rx3 program (Rehab, Refit, and Return to Duty) is a comprehensive rehabilitation and recovery app designed to support military Service Members and Veterans in recovering from common musculoskeletal injuries and improving physical fitness and overall health. The program underwent a significant expansion in 2022 to enhance representation, address the evolving needs of its users, and increase accessibility through a new mobile application.

Since its relaunch in 2023, engagement with the Rx3 program has steadily increased, demonstrating its growing impact and effectiveness in the military community. CHAMP received a Joint Incentive Fund award in 2024 in partnership with the Office of Women's Health, Veterans Affairs, with three goals: 1) Conduct user engagement testing with the new Rx3 mobile application to inform app enhancement and improvements; 2) Assess efficacy of the knee, low back, and postpartum Rx3 programs; and 3) Validate a mobile version of the Defense and Veterans Pain Rating Scale. Work on this project will begin in 2025.



### Features on Mobile and Tablet

- Save directly to your home screen
- Pain rating & tracking
- Daily progress tracking
- Program summaries
- Video demonstrations
- Printable progress reports
- Accessible without internet connection once saved to phone or tablet, does not include video access

CHAMP  
Consortium for Health and Military Performance

hjf

This program has been designed to work across a range of different outlets

Mobile, Tablet, and Desktop compatible

CHAMP  
Consortium for Health and Military Performance

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Do your patients need support returning to fitness after injury?  
The Rx3 knee program can help!

Scan the QR code on your phone or tablet  
Download the Rx3 app  
Start the knee program

CHAMP  
Consortium for Health and Military Performance

Mr. Robert Rossi rrossi@genevusa.org  
LTC Jeremy Schroeder jeremy.d.schroeder.mil@health.mil

### DOWNLOAD THE APP

- 1 Scan the QR code below using your mobile device
- 2 Click the download button on the "Download the Rx3 app" banner
- 3 A pop up will display information on how to download  
*NOTE: This will look different for iPhone and Android users*
- 4 Follow the instructions for your device

#### IPHONE USERS

1. Tap the share icon at the bottom right of the page
1. A menu of options will be displayed
2. Select the "Add to Home Screen" option
3. Next, input the name you wish to save as—we recommend saving as "Rx3"
4. Next tap "add"
5. Now navigate to the device homepage, and the app should be displayed there

#### ANDROID USERS

1. Tap the vertical 3-dot icon in the top right of your screen
2. A menu of options will be displayed
3. Select the "Install the App" option OR "Add to Home Screen" option
4. Next, input the name you wish to save as—we recommend saving it as "Rx3"
5. Next tap "add"
6. Now navigate to the device homepage, and the app should be displayed there

@HPROnline #RehabRefit



## Patricia A. Deuster Human Performance Laboratory (DHPL)

CHAMP's Patricia A. Deuster Human Performance Laboratory team conducts research focused on Warfighter exertional illness, including exertional heat illness, exercise collapse associated with sickle cell trait (ECAST), and exertional rhabdomyolysis. Our research focuses on all elements of the exertional illness chain of survival, from prevention to prehospital care, emergency care, advanced care, and return to duty. The DHPL facilities include molecular and environmental physiology laboratories, an exercise physiology laboratory (used for aerobic and anaerobic exercise testing as well as body composition assessment) and an environmental chamber, which is used for both heat-related research and heat tolerance testing for clinical return-to-duty decision-making.

### An Interdisciplinary Approach to Investigating Exertion-Related Illness in the Service Member (ERIS)

The ERIS study team aims to identify molecular subtypes of exertion-related injuries (ERI). Our goal is to develop a framework to translate our findings into clinical practice. Our team evaluates the risk-stratification process for ERI recurrence by tracking Service Members with ERI over two years. In 2024, the initial clinical algorithm was implemented at five military treatment facilities. We've enrolled 472 participants to date, with many participants completing heat tolerance testing. Enrollment also continued in the genetics portion of the ERIS study, where we collected 109 genetic samples that will be analyzed to determine molecular subtypes of exertion-related injuries. The results of data analysis will be used to inform conversion of the current criteria for those at high risk for ERI recurrence into a more refined scoring system and translated into clinical practice for providers to optimize return-to-duty decisions.

### Exercise Collapse Associated with Sickle Cell Trait (ECAST)

The ECAST team continues its research on heat- and exertion-related injuries by investigating biological and clinical markers associated with ECAST. The study began in 2022 to identify risk factors in sickle-cell-trait (SCT) carriers with (case) and without (control) a history of ECAST. The study also aims to determine whether any biomarkers can be applied to identify varying levels of risk for people with SCT. The study team continued recruiting and enrolling participants in 2024, working toward our goal of enrolling 15 case and 15 control participants. To date, we have enrolled 22 participants (14 controls, 8 cases), and all samples are being processed and analyzed.





## Warrior Heat- and Exertion-Related Events Collaborative Outcome Analysis

Study researchers aim to create a database and registry for exertion-related events (ERE) and assess related outcomes to analyze the impact of ERE-related policy reform and implementation. In 2024, the study team worked with a steering committee made up of ERE experts from across USU and DoD, as well as the Joint Trauma System team, to develop a data dictionary and identify variables to include in the registry database. We have identified data sources and collaborators to extract the data and populate the registry database. The Internal Review Board (IRB) protocol is expected to begin in early 2025.

## Dietary Ingredients to Minimize Environmental Heat Injury 2.0

Researchers aim to determine whether dietary supplement ingredients impact the effects of heat stress on mitochondrial function, intestinal barriers, and renal function in mice. In 2024, the study team executed multiple experiments and accomplished two of our three project goals. Samples have been processed and analysis is underway.



### DHPL Key Metrics



**4** Ongoing research studies



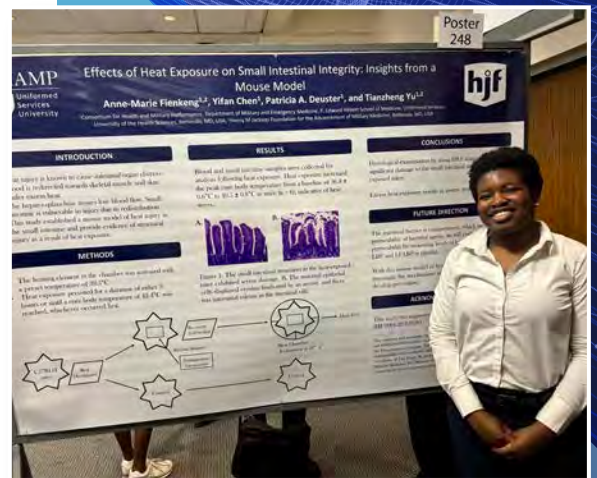
**4** Oral presentations



**4** Poster presentation



**6** Published Manuscripts





## Warrior Heat- and Exertion-Related Events Collaborative (WHEC)

WHEC is a multidisciplinary advisory group focused on developing and implementing procedures to help providers, Service Members, and civilians prevent and treat heat-related illnesses and injuries. We work in collaboration with the Army Heat Center at Fort Benning, Georgia (previously Fort Moore), and USU's Multidisciplinary Case Review Committee (MDCRC). Since its inception in 2020, WHEC has been dedicated to advancing the science and the Defense Health Agency's Clinical Practice Guidelines for preventing, reducing, risk-stratifying, and managing exertional injuries and heat illness. We also provide information about the surveillance, research, and education on heat-related injuries.

### Global Impact at the 2024 Paris Olympics

Healthcare providers at the Paris Olympics used Managing the Collapsed Runner: Marine Corps Marathon Medical Triage and Algorithms to ensure heat-related injuries were managed efficiently and effectively during running events. CHAMP and the International Institute for Race Medicine collaborated with the Marine Corps Marathon to create the collection of algorithms as a clinical resource for medical providers to guide triage and management of heat-related injuries during the marathon.

### Secured Sustained Funding

WHEC secured Defense Health Agency funding to support ongoing and future heat-related initiatives and research, ensuring long-term sustainability and program impact.

### Annual Heat Forum

This successful event gathered stakeholders from across disciplines to discuss and promote best practices in heat illness prevention and treatment.

### Heat Illness Clinical Practice Guideline (CPG)

WHEC published the Clinical Practice Guideline for the Prevention, Diagnosis, and Management of Exertional Heat Illness to reflect the latest research and findings in exertional heat illness management for providers. This CPG details effective cooling measures at each level along the chain of survival (e.g., prehospital field, emergency medical services transport, and emergency department). This CPG represents the first Joint Service collaborative effort to establish consensus around exertional heat illness prevention, diagnosis, management, and return to duty, while recognizing the diverse missions of the branches of the Armed Forces.

### OSHA Cites WHEC Publications

The Occupational Safety and Health Administration (OSHA) proposed rule, "Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings" cited 12 heat-related publications from Dr. Francis O'Connor and the WHEC Clinical Practice Guideline for the Management of Exertional Rhabdomyolysis in Warfighters 2020.

#### WHEC Key Metrics



**100+**

Ask the Expert questions answered



**3**

Oral presentations



**5**

Poster presentations



**5**

Published manuscripts



**1**

Clinical Practice Guideline

#### Heat Campaign



**204,554**

Impressions across social media



**4,145**

USU recipients received Heat Tool Kit



**2,375**

HPRC newsletter readers received Heat Tool Kit; 869 opened the tool kit (24% open rate)



## Military Nutrition Environment (MNE)

The Military Nutrition Environment includes all food, drink, and dietary supplement options available in local military settings. As a key part of Total Force Fitness and Human Performance Optimization, MNE impacts performance and mission readiness. Transforming the MNE includes collaboration between community leaders, registered dietitians, health promotion educators, food service operators, and leadership. This CHAMP team is committed to supporting MNE assessment and intervention efforts worldwide to optimize performance nutrition through a variety of initiatives.

### Military Nutrition Environment Assessment Tool (mNEAT)

This DoD tool guides users through evaluating the food landscape of an installation or ship by scoring a variety of food venues across three areas: food availability, food policy, and behavioral design. Since its inception, 4,782 mNEAT assessments have been submitted by DoD users—more than 900 of which were in 2024. Results from mNEAT evaluations provide a look at the local food landscape and identify areas of success and areas of opportunity to better fuel the military community through targeted interventions.

### Go for Green® (G4G)

This joint-Service performance nutrition initiative in military dining facilities is designed to optimize access, availability, and knowledge of high-performance foods.

More than 1,819 users completed G4G training modules on DoD's Joint Knowledge Online in 2024. G4G web presence continued to see its numbers climb, with 223,879 page views, and G4G recipes took the top spot for most-read MNE web content, at 75,222. The G4G Facebook page got more than 151,000 impressions. Optimizing the G4G program through identifying best practices, providing resources, and offering consultative support benefits both program operators and diners.



### GAO Review

The MNE team collaborated on high-level DoD efforts, specifically the GAO Review 106155 DoD Food Program: Additional Actions Needed to Implement, Oversee, and Evaluate Nutrition Efforts for Service Members to help shape corrective action plans to meet GAO recommendations. We provided CHAMP MNE tools (mNEAT app, G4G Program Fidelity Assessment), resources, and expertise to develop steps for the Services to meet recommendations and improve the food environment. (Managing the G4G program materials, tools, and resources supports 8 of the 16 recommendations that reference optimizing the use of the G4G program.) The MNE team also completed high-priority enhancements to the mNEAT app in support of the corrective action plan for the GAO recommendations. Specifically, we added an action plan template to optimize the user experience, provide a more comprehensive tool, and allow for better data analysis. In addition, the team led changes to the mNEAT dining facility assessment to better assess food environments and nutrition standards.





## Addressing Questions from DoD Users

As part of translating research to education efforts, the MNE team answered 205 MNE technical and consultation questions from users across DoD (e.g., mNEAT app, G4G program, and other MNE-related initiatives), helping DoD facilities to plan, execute, and maintain local MNE assessments and interventions. Some of the questions the team answered included:

*Hello G4G team! We continue to get ongoing comments from recruits about wanting vegetarian entrees. Was wondering if you were able to put together a poster on how to “create your own green entree” with a salad bar?*

*We are using the Go4Green program for the Army National Guard. The recipes are plentiful and quite helpful. Is there some mechanism on the site to scale the recipe as our number of servings changes regularly?*

*Is it possible on the mNEAT website to see a more detailed breakdown of the scores, for example how many points each question is worth?*

## Healthy Eating Pilot

The MNE team completed the USMC Marine Corps Community Services Non-Appropriated Fund Healthy Eating Pilot at MC Base Camp Lejeune/MCAS New River. It was the first research to implement G4G/ Fueled to Fight® (F2F) program components in non-appropriated fund food venues.

## Omega-3 Index Study

Our researchers explored dietary interventions focusing on nutrition needs, nutrients of interest, and behavior change on health, readiness, and performance, including low omega-3 status in the active-duty population. The intervention phase of the study included omega-3 fortified protein shakes to increase Omega-3 Index levels and physical performance. We completed the study, Evaluate the Use of Omega-3 Fortified Smoothies to Improve Omega-3 Index and Physical Performance-Related Outcomes among Soldiers, at performance site one at Fort Campbell, Kentucky, in October 2024. Performance site two at Fort Drum, New York, will begin a second cohort in January 2025.

## Vegetable Intake Study

The MNE team provided 400 meal kits to active-duty Service Members at NSA-Bethesda to assess vegetable intake and likability as part of the Evaluating Effectiveness of Spices and Herbs to Increase Vegetable Intake among Military study. The aim was to see if incorporating spices and herbs into vegetable offerings could boost vegetable intake, a key food group Service Members typically don't eat enough of. Intake of the heat-and-serve vegetables was very high for both the spiced and plain preparations. There was minimal difference between Service Members eating spiced and plain vegetables, suggesting that both were well accepted.

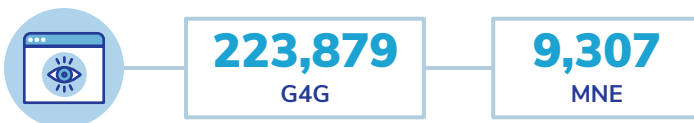




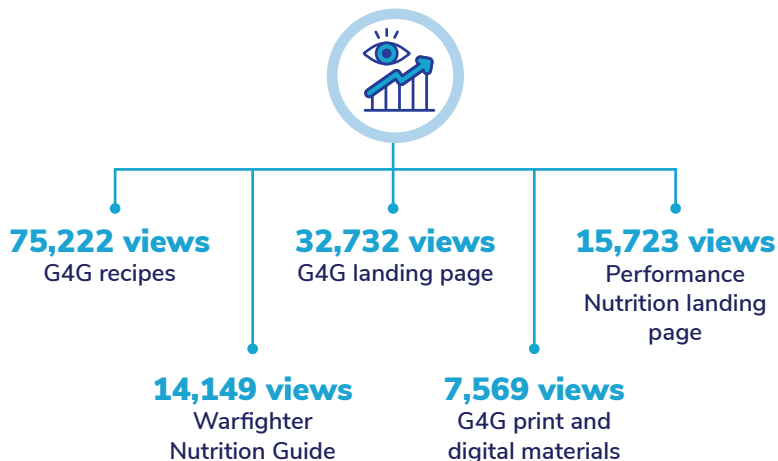
In 2024, the MNE team presented to audiences at the following:

- American Public Health Association Conference
- Defense Threat Reduction Agency
- DoD Food, Nutrition, and Dietary Supplements and Other Self-Care Products Subcommittees
- Expeditionary Exploitation Unit ONE, Indian Head, MD
- Food and Nutrition Conference and Expo
- H2F unit, Fort Campbell, KY
- Human Performance Optimization conference at Georgia Southern University
- Institute for the Advancement of Food and Nutrition Sciences
- Iowa National Guard
- Joint Services Recipe Committee meeting at DEVCOM Soldier Center, Natick, MA
- Military Health System Research Symposium
- Military Injury Prevention Research to Practice Education Series
- Pentagon Fit to Win Wellness Clinic, Arlington, VA
- USDA Agricultural Science Center of Excellence for Nutrition and Diet (ASCEND) for Better Health
- U.S. European Command
- U.S. Space Force Holistic Health Integrator
- USU Research Days

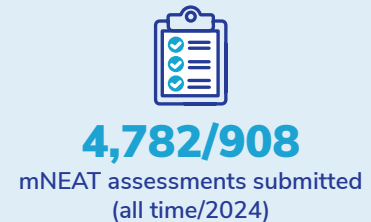
#### Website page views



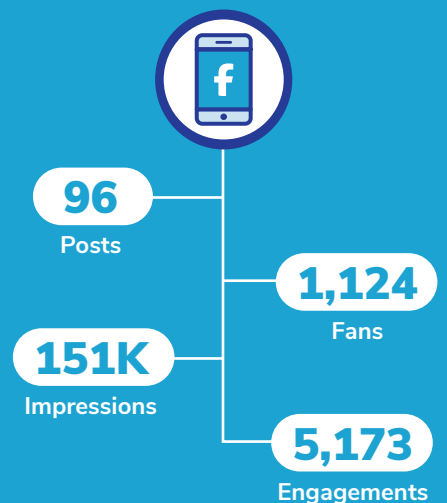
#### Most viewed website content



#### MNE Key Metrics



#### Social media G4G Facebook page





## Dietary Supplements and Operation Supplement Safety (OPSS)

The mission of OPSS is to provide the best evidence-based information about dietary supplements to Service Members, their families, healthcare providers, and leaders to achieve human performance optimization. Many Service Members use dietary supplements—to improve performance, lose weight, for bodybuilding, and more. Unfortunately, some dietary supplements can compromise rather than improve performance. Our goal is to provide the tools and resources to help users make informed decisions about dietary supplements to optimize their health, performance, and careers.

### Performance Enhancing Substances

OPSS expanded its mission in 2024, in partnership with the Office of Drug Demand Reduction, to encompass and highlight the topic of performance enhancing substances (PES) in educational materials, outreach programs, and a new section on the OPSS website. The first PES Summit was hosted in partnership with OPSS at Major League Baseball Headquarters in New York City in May 2024.

### OPSS Summit

The OPSS team hosted the second annual OPSS Summit per the requirement in DoDI (DoD instruction) 6130.06: Use of Dietary Supplements in the DoD. The summit was held at the Henry M. Jackson Foundation in Bethesda, Maryland, in September 2024 with 86 DoD and military leaders, healthcare providers, and drug testing personnel in attendance. Attendees engaged in sessions covering third-party certification, Service-specific experiences with PES testing, and policies and issues surrounding dietary supplement use in the military.

### Social Media Campaigns

OPSS hosted two social media campaigns in 2024; Perform Best Without PES in April and Let's Talk Dietary Supplements in October. Content on the importance of using third-party certified products, common performance-enhancing substances, and peptide hormones garnered over 200,000 impressions. During these campaigns, OPSS partnered with numerous agencies within DoD Food, Nutrition, Dietary Supplements, and Other Self-Care Products Subcommittees to educate Service Members through multiple channels.

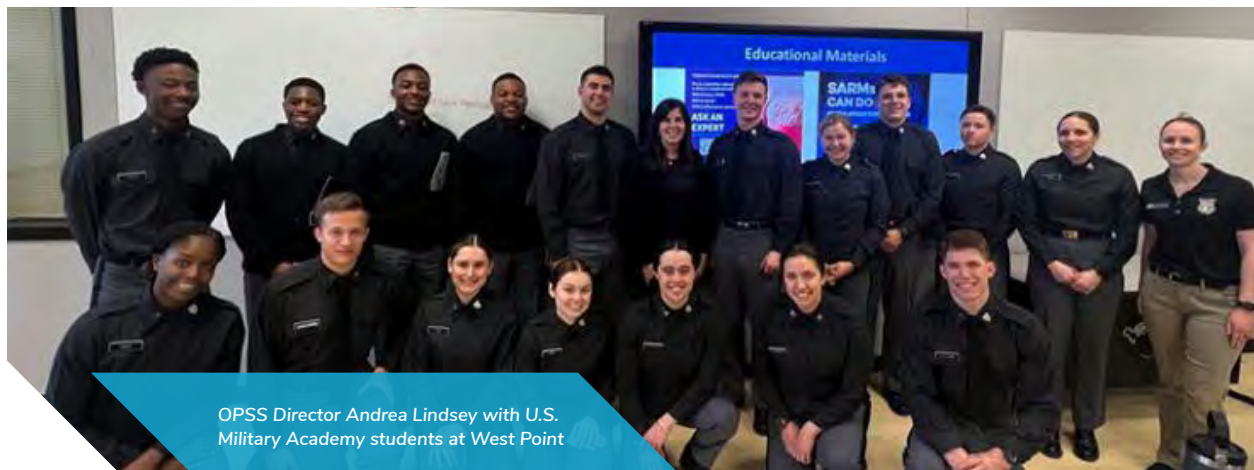
### Prohibited Ingredients

The OPSS team updates the DoD Prohibited Dietary Supplement Ingredients List per DoDI 6130.06 when new information becomes available from scientific data, federal partners, or information obtained from dietary supplement product testing and inquiries from Ask the Expert questions. Substances that don't meet specific criteria outlined in DoDI 6130.06 for inclusion on the list are presented for inclusion by the OPSS Advisory Board. The Board voted on ingredients in February and November 2024. In total, 61 substances were added to the DoD Prohibited Dietary Supplement Ingredients List.

Performance Enhancing Substances Summit  
at Major League Baseball headquarters







OPSS Director Andrea Lindsey with U.S. Military Academy students at West Point

### OPSS Ingredient Database

One major focus for the OPSS team is adding substances to the OPSS Ingredient Database (OPSSID) and assigning each ingredient a color-coded safety rating. An expert panel of military and civilian clinical providers and healthcare professionals met on three occasions to create and finalize criteria for each rating. OPSSID currently contains 1,633 total substances and 8,826 “other names” for each ingredient. Of those 1,633 substances, more than 1,250 have been assigned safety ratings, leaving nearly 366 substances left for review. This project directly supports maintenance of the DoD Prohibited Dietary Supplement Ingredients List and the OPSSup mobile app under development.

### Product Testing Publication

OPSS conducted a product testing and analysis project to explore whether select weight-loss dietary supplements marketed online from companies offering military discounts are accurately labeled, and whether they contain ingredients prohibited for use by Service Members. The findings, published in JAMA Network Open in May, suggest that predatory marketing and the low quality of weight-loss dietary supplements available online pose a threat to Service Members and the public. OPSS completed a complementary product testing and analysis project specifically examining weight-loss dietary supplements sold on or near military bases across the country, highlighting similar concerns.

### Creatine Recommendations

OPSS developed and delivered a state-of-the-science paper to the Department of Defense Performance Nutrition Working Group to help inform evidence-based recommendations surrounding the appropriate use of creatine monohydrate in the military. Report findings highlighted evidence surrounding appropriate dosages, outcomes related to physical and cognitive performance, and next steps for research.

### Third-Party Certification

OPSS continues to educate on the importance of using third-party certified dietary supplement products to reduce the risk of adverse events and positive drug tests in the military. The team published an evidence-based article for the OPSS website and created handouts on the topic for distribution. OPSS also engaged in conversations with retailers and the Joint Buyer’s Alliance to increase the visibility of third-party certified products in military retail facilities. OPSS Director Andrea Lindsey also published a chapter on third-party certification for her work with the NATO Technical Team HFM-326: Diet Supplementation for Military Personnel.

### OPSS Working Group and Collaborations

OPSS convened the OPSS Working Group five times in 2024 to engage in conversations surrounding concerns with dietary supplement use in the military, changes to military policy regarding use, and to help identify demand signals for needed education from federal, DoD, and health professional partners.

## OPSS Key Metrics



**51** Educational presentations to military, healthcare provider, and allied-health professional audiences across the military community, supporting the educational requirement mandated in DoDI 6130.06.



**3** Health fairs



**7** Conference presentations and 3 summits



**3** Podcasts



**5** Interviews



**3** Peer-reviewed publications and 2 lay articles



**4** New website articles and significant updates to 8 others



**1,523** Evidence-based answers to Ask the Expert questions from Service Members, healthcare providers, and other consumers of dietary supplement products



**1,250** Prohibited ingredients list items updated with color-coded safety ratings

## OPSS Website



**454,752**

Active Users

**1,048,846**

Views

**71.11%**

Engagement rate

## Most popular website content



**274,835**

DoD Prohibited Dietary Supplement Ingredients

**61,070**

Performance Enhancing Substance MK-677 (Ibutamoren)

**71,440**

OPSS Scorecard: Check your Dietary Supplement

**27,586**

Blue Lotus: Prohibited for Use

**34,645**



Materials downloaded from the website

**21,839**



Materials printed from the website

OPSS saw significant increases in social media followers, impressions, and engagements since 2023:



**10K+**

Followers



**2.1K+**

Impressions



**62K+**

Engagements



In 2024, the OPSS team gave 51 educational presentations to audiences at the following organizations:

Army Brigade Healthcare Provider Team	Medical Executive Committee Training
Army Division Surgeon Course	Military Personnel in Amsterdam, the Netherlands
Camp Arifjan and Camp Buehring	Military WIC Office Council
Canadian Armed Forces Nutrition and Human Performance Committee	Naval Air Station Whidbey Island
DHA Health Promotion Information Forum	Navy Fitness Advisory Council
Defense Threat Reduction Agency	Navy Human Performance Subcommittee
Detroit Arsenal	OneOp
Dietary Supplement Label Database Working Group	Pain Care Skills Training
DoD Food, Nutrition, Dietary Supplements, and Other Self-Care Products Subcommittees	Pentagon Clinic
Force Fitness Instructors Course	Space Force Major Command
Fort Carson	Space Force Train the Trainer
Fort Jackson	South Carolina Army National Guard
Holistic Health and Fitness Lunch and Learn	Virtual Train the Trainer
Joint Advanced Nutrition and Dietetics Symposium	West Point
Joint Base Lewis-McChord	USU B3 Dietary Supplement Intersession
Kansas Army National Guard	USU Med Students
Marine Corps Detachment Goodfellow AFB	USU Global Perspective Seminar





## Psychological, Social & Spiritual Fitness (PSS)

The Psycho-Social-Spiritual team works to integrate the psychological, social, and spiritual domains of TFF to enhance Warfighter health and performance. To do so, the team establishes core metrics for DOD-wide use, identifies critical gaps in research, and fosters collaborations. To further its mission, the PSS team focused on four key projects in 2024.

### Evidence-Based Spiritual Fitness (EBSF)

This USMC project aims to bring scientific approaches to understanding and measuring spiritual fitness. The PSS team completed a research study with the Marine Corps (USMC) Training and Education Command (TECOM), one of the largest mixed methods studies ever conducted on spiritual fitness for the Marines. USMC TECOM gained key insights into how Marine student leaders define spiritual fitness and their views on the value of available spiritual fitness resources. Study results will help inform chaplaincy practices, enhance operational readiness and resilience, support leadership development, and contribute to ongoing efforts to measure and understand the role of spiritual fitness in the health and readiness of our force.

### Human Performance Teams (HPT)

These projects focus on understanding individual- and team-based characteristics of human performance team practitioners and providers. We also aim to better understand the facets of interprofessional and interdisciplinary teaming of health and performance practitioners in DoD. In 2024, the PSS team completed an exploratory study and produced a final report. The findings from the exploratory study will inform 2 other funded studies on teaming among practitioners serving musculoskeletal injury and will be translated into education products serving human performance programs within DoD.





## Capability-Based Blueprinting (CBB)

This project connects Service Members' health and performance needs directly to career field and mission requirements to optimize human performance. In 2024, the CBB team brought together the results of three previous CBB efforts with Weapons Armament Systems career field members (2W1s) across three separate aircraft. The combined report, which compared three fighter squadrons across several domains of TFF, was delivered to Headquarters Air Force Weapons Armament career field managers. Findings from the combined report suggest that certain health and performance factors for 2W1s appear generalizable beyond the communities studied (i.e., physical and nutritional fitness factors), while other factors had a tendency to be more context dependent (i.e., social and spiritual fitness factors).

## U.S. Army Office of the Chief of Chaplains (OCCH)

This program improvement and evaluation project is in its second year, in partnership with the U.S. Army Office of the Chief of Chaplains. In 2024, the PSS team created a logic model for a key OCCH program, analyzed data on the status of social and spiritual fitness in the Army, and gathered soldier and chaplain feedback. These efforts demonstrate OCCH's commitment to providing high-quality programming for social and spiritual fitness and will result in programmatic improvements and measurability.

### PSS Key Metrics



9

Presentations



2

Studies completed



2

Final reports delivered



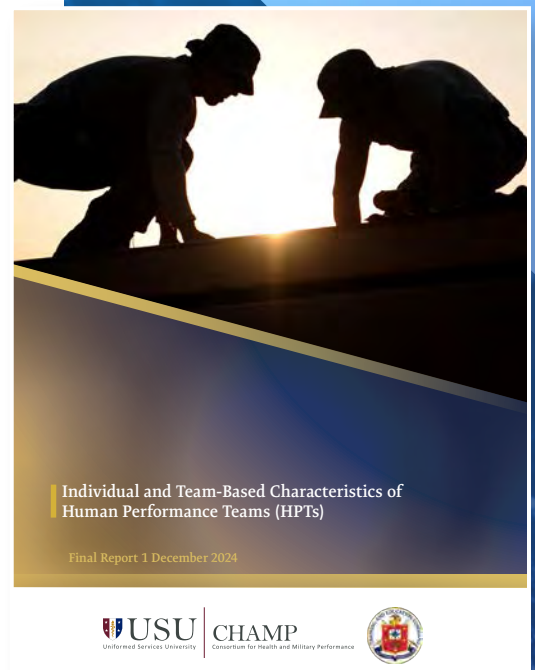
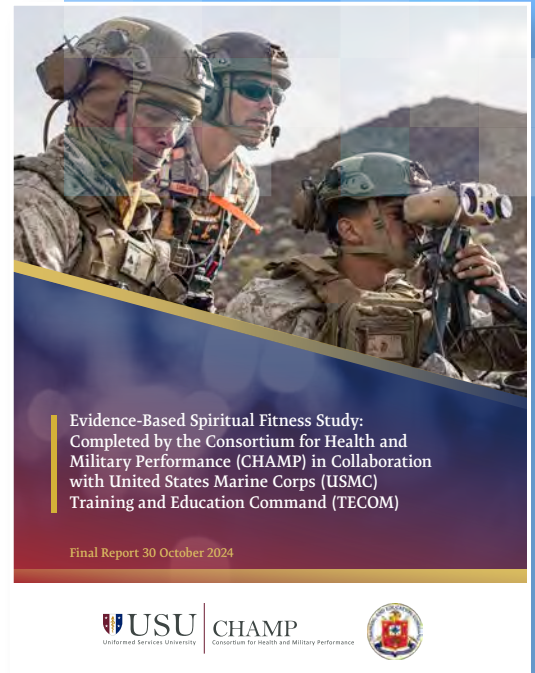
2

Funded studies initiated



2

Publications, 2 more in press





Visit the publications page on the CHAMP website for the full list.

# PUBLICATIONS, POSTERS & PRESENTATIONS



26

Journal articles  
and 2 book chapters



43

Poster and research  
abstract presentations



17

Presentations at  
scientific conferences

## Select Peer-Reviewed Publications

Aras, S. G., Runyon, J. R., **Kazman, J. B.**, Thayer, J. F., Sternberg, E. M., & **Deuster, P. A.** (2024). Is Greener Better? Quantifying the Impact of a Nature Walk on Stress Reduction Using HRV and Saliva Cortisol Biomarkers. *International Journal of Environmental Research and Public Health*, 21(11). doi:10.3390/ijerph21111491

**Chen, Y., Yu, T., & Deuster, P.** (2024). Maintaining Mitochondrial NAD<sup>+</sup> Homeostasis is Key for Heat-Induced Skeletal Muscle Injury Prevention Despite Presence of Intracellular Cation Alterations. *Applied Physiology Nutrition and Metabolism*. doi:10.1139/apnm-2024-0157

**Crawford, C., Lindsey, A.T.**, Avula, B., Katragunta, K., Khan, I.A., & Deuster, P.A. (2024). Label Accuracy and Quality of Select Weight-Loss Dietary Supplements Sold on or near U.S. Military Bases. *Nutrients*, 16(24):4369. doi:10.3390/nu16244369

Currie, T. L., Engler, M. M., Krauthamer, V., **Deuster, P. A.**, & **Scott, J. M.** (2024). Strategic Considerations for Using Dietary Supplements in Austere Environments to Enhance Warfighter Readiness. *U.S. Army Medical Department Journal*, 106.

**Dartt, C. E., Gregory, A. B., de la Motte, S. J., & Ricker, E. A.** (2024). Determinants of Medical Care-Seeking Behavior for Musculoskeletal Conditions During U.S. Marine Corps Training: A Thematic Analysis. *Journal of Athletic Training*. doi:10.4085/1062-6050-0707.23

**Deuster, P. A., Linderman, J. R., Hua, D. P., & Lindsey, A. T.** (2024). Uncovering the World of Dietary Supplements and Performance-Enhancing Substances in the Military. *Journal of Special Operations Medicine*. doi:10.55460/a580-yj5a

Estevao, I. L., **Kazman, J. B.**, Bramer, L. M., Nicora, C., **Ren, M. Q., Sambuughin, N.**, Munoz, N., Kim, Y. M., Bloodsworth, K., **Richert, M.**, Teeguarden, J., Burnum-Johnson, K., **Deuster, P. A.**, Nakayasu, E. S., & Many, G. (2024). The Human Plasma Lipidome Response to Exertional Heat Tolerance Testing. *Lipids in Health and Disease*, 23(1), 380. doi:10.1186/s12944-024-02322-7





**Kazman, J. B.,** Nelson, D. A., Ahmed, A. E., **Deuster, P. A., O'Connor, F. G.,** Mancuso, J. D., & Lewandowski, S. A. (2024). Risk for Exertional Heat Illness Among U.S. Army Enlistees: Climate Indexes, Intrinsic Factors and their Interactions. *British Journal of Sports Medicine*, bjsports-2024-108441. doi:10.1136/bjsports-2024-108441

Kester, R. M., **Abraham, P. A., Leggit, J. C., Harp, J. B., Kazman, J. B., Deuster, P. A., & O'Connor, F. G.** (2024). Heat Tolerance Testing and the Return to Duty Decision: A Two-Year Case Cohort Analysis. *Journal of Special Operations Medicine*. doi:10.55460/w7tv-mbrz

**Kirkpatrick, K. M., Robinson, D. J., Hinman, S. J., Kegel, J. L., Chamberlin, R. A., McCarthy, R. G., & Scott, J. M.** (2024). "Food Away from Home" Options in Local Military Nutrition Environments. *AJPM Focus*. doi:10.1016/j.focus.2024.100293

Nelson, D. A., **Kazman, J. B.,** Nelson, K., **Edgeworth, D. B., Lindow, M. F.,** Emanuele, P., Clifton, D. R., Choi, Y. S., Shell, D., & **Deuster, P. A.** (2024). Fasciotomy and Occupational Separation Among U.S. Service Members with Lower Extremity Chronic Exertional Compartment Syndrome. *Medicine & Science in Sports & Exercise*, 56(9), 1685–1693. doi:10.1249/mss.0000000000003471

**Ren, M., Sambuughin, N.,** Mungunshukh, O., **Edgeworth, D. B.,** Hupalo, D., Zhang, X., Wilkerson, M. D., Dalgard, C. L., **O'Connor, F. G., & Deuster, P. A.** (2024). Genome-Wide Analysis of Exertional Rhabdomyolysis in Sickle Cell Trait Positive African Americans. *Genes (Basel)*, 15(4). doi:10.3390/genes15040408

**Ricker, E. A.,** Koltun, K. J., & **de la Motte, S. J.** (2024). Hormonal Contraception and Medical Readiness for Female Service Members. *American Journal of Obstetrics & Gynecology*. doi:10.1016/j.ajog.2024.05.044

Troncoso, M. R., Wilson, C., **Scott, J., & Deuster, P. A.** (2024). U.S. Navy Sailors Modify Their Eating Behaviors to Pass Cyclic Physical Readiness Tests. *Journal of Nutrition Education and Behavior*. doi:10.1016/j.jneb.2024.05.232



## 2024 Research Poster and Abstract Presentations



*43 total: 22 oral and 21 poster presentations to the following audiences:*

Academy of Nutrition and Dietetics	Military Injury Prevention Research to Practice Education Series
American College of Sports Medicine	Military Health System Research Symposium
American Public Health Association	National Athletic Trainer's Association
American Society for Nutrition	National Nutrient Databank
Association of Military Surgeons of the United States	Society for Applied Anthropology
Human Performance Optimization Conference by Georgia State University	Traumatic Brain Injury Centers of Excellence Quarterly Education Series
International Conference on Food Science and Nutraceuticals	U.S. Olympic & Paralympic Committee National Governing Body
International Congress on Integrative Medicine and Health	USU Research Days

## Presentations at Scientific and Other Conferences



*17 total for 10 organizations*

American College of Sports Medicine	Mayo Clinic/Stanford Medicine
American Psychological Association	Military Health System Research Symposium
Central Alabama VA Dietitians	Traumatic Brain Injury Centers of Excellence
Defense Strategies Institute	U.S. Department of Agriculture
International Magnesium Symposium	
Marine Corps Commanders	

## Educational Training Presentations



*29 presentations to the following audiences, including student outreach, training presentations, CHAMP booth events, webinars, and podcasts*

A.T. Augusta Military Medical Center	Sports Medicine Fellows at Ft. Belvoir, VA
Carrier Wing 1 at NAS Oceana	USU Family Medicine Interest Group
Dayton VA Medical Center	USU Graduate School of Nursing
DEVCOM Soldier Center, Natick, MA	USU Medical School
Defense Threat Reduction Agency	USU Sports Medicine Fellows
DoD Primary Care Providers, Bethesda, MD	USU Statistics Group
DoD Primary Care Providers, El Paso, TX	USU TriService Nursing Program
Marine Corps Base Quantico	Walter Reed National Military Medical Center
National Guard Performance Education Center	

Note: All organizations listed here represent those not already mentioned under specific units.



# PARTNERS & COLLABORATORS

*Partnerships and collaborations are an integral part of CHAMP's work. These far-reaching relationships are at the core of CHAMP's education and research efforts. Expanding and solidifying military, federal, and civilian partnerships and continuing to collaborate with partner organizations helps us broaden and strengthen our footprint in HPO/TFF across DoD.*

## Internal DoD USU Stakeholders

Center for Deployment Psychology  
Center for Health Services Research  
Center for Rehabilitation Sciences Research  
Defense and Veterans Center for Integrative Pain Management  
Drug Demand Reduction Program  
Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc.  
Military Cardiovascular Outcomes Research  
Military Traumatic Brain Injury Initiative (MTBI2)  
Musculoskeletal Injury Rehabilitation Research for

Operational Readiness  
TriService Nursing Research Program (TSNRP)  
USU College of Allied Health Sciences  
USU Department of Anesthesiology  
USU Department of Military and Emergency Medicine  
USU Fellowship Program  
USU Graduate School of Nursing  
USU Office of Student Affairs  
USU School of Medicine

## External DoD USU Stakeholders

27th Force Support Squadron, Cannon AFB  
81st Readiness Division, Army Reserve  
214th Attack Squadron (214 ATKS) Arizona Air National Guard  
Air Force Lifestyle & Performance Medicine Working Group  
Air National Guard  
Alaska Army National Guard  
Armed Forces Health Surveillance Center  
Army National Guard  
Army Research Institute of Environmental Medicine  
Army Resilience Directorate  
Assistant Secretary of the Air Force for Energy, Installations, and Environment  
Association of the U.S. Army  
Defense Centers for Public Health

Defense Center of Excellence for Traumatic Brain Injury  
Defense Health Agency  
Defense Threat Reduction Agency  
Grand Forks Air Force Base  
Headquarters of the Department of the Air Force  
Iowa Army National Guard  
Military OneSource  
National Defense University  
National Guard Professional Education Center  
Naval Health Research Center  
Naval War College  
New Mexico Army National Guard  
North Dakota Army National Guard  
Ohio Army National Guard  
U.S. Air Force

U.S. Air Force Academy

U.S. Army

U.S. Army Center for Initial Military Training

U.S. Army Legal Services Agency

U.S. Army Holistic Health and Fitness (H2F)

U.S. Army Office of the Chief of Chaplains

U.S. Coast Guard

U.S. Marine Corps

U.S. Military Academy at West Point

U.S. Naval Academy

U.S. Navy

U.S. National Guard Bureau

U.S. Space Force

Walter Reed National Military Medical Center

## External Federal Partners

Center Magnesium Research and Education

Office of Dietary Supplements, National Institutes of Health

U.S. Department of Homeland Security

U.S. Department of State

U.S. Department of Veterans Affairs

U.S. Department of Veterans Affairs, Dayton Healthcare

## Collaborators: Academic Institutions

George Mason University

Georgia Institute of Technology

The Ohio State University

Pennington Biomedical Research Center

University of Connecticut, Korey Stringer Institute

University of Maryland Baltimore (School of Medicine)

University of Minnesota

University of Mississippi, Oxford

University of Pennsylvania

University of Pittsburgh

## Professional Associations

American College of Lifestyle Medicine

American College of Sports Medicine

American Psychological Association Division 19  
(Society for Military Psychology)

## Other Partners & Collaborators

Camp Lejeune

Camp Pendleton

DataVation, LLC

Fort Belvoir

Fort Bragg (formerly Fort Liberty)

Fort Campbell

Fort Cavazos

Fort Drum

Fort Jackson

Fort Knox

Fort Moore

Fort Polk

Fort Stewart

Inova-George Mason University Center for Clinical Proteomics

Lackland Air Force Base

Marine Corps Recruit Depot Parris Island

Marine Corps Recruit Depot San Diego

U.S. Military Academy

Wounded Warrior Project

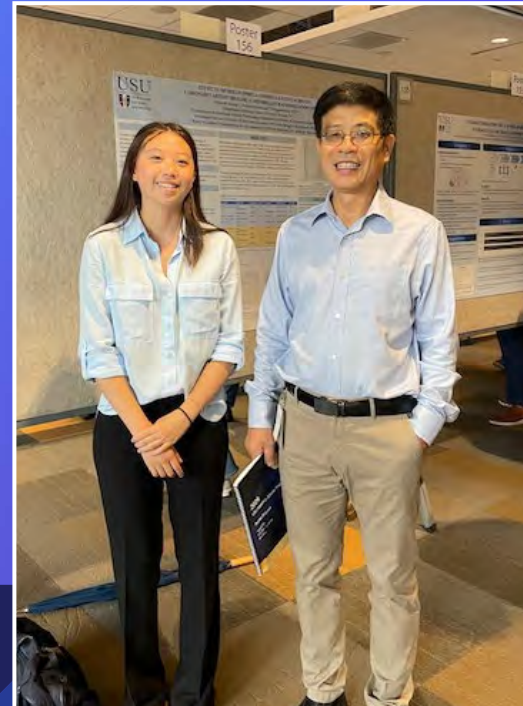


## Internship Program

CHAMP hosted a record number of summer interns in 2024. Eleven students participated in various research projects, working closely with mentors from HPRC, OPSS, and all research domains at CHAMP. This collaborative approach provided interns with valuable hands-on experience and exposure to a wide range of research methodologies and techniques. This robust internship program strengthens CHAMP's commitment to training the next generation of scientists and researchers.

Student intern Michelle Hsiung worked with Drs. Ming Ren and Melissa Rittenhouse on a poster titled, "Effects of Serum OMEGA-3/OMEGA-6 Fatty Acids on Coronary Artery Disease: A Mendelian Randomization." The results support previous claims that omega-3 has no protective effect on CAD. The results for omega-6 were inconclusive, with conflicting findings.

Another intern worked with two CHAMP researchers who reviewed the literature on social health (e.g., stigma, harassment) in relation to musculoskeletal pain and injury in tactical populations. She shadowed analysis of existing data related to this topic and prepared an abstract that was accepted to the American College of Sports Medicine Mid-Atlantic Regional Conference in November, where she presented a 10-minute talk.



# CHAMP



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