

**ADVANCING  
HUMAN PERFORMANCE**



**2022**

**CONSORTIUM FOR  
HEALTH AND MILITARY  
PERFORMANCE (CHAMP)**

**Annual Report**





# Table of Contents

<b>Executive Director's Letter</b>	<b>4</b>
<b>CHAMP Leadership</b>	<b>5</b>
<b>CHAMP Team</b>	<b>6</b>
<b>Mission &amp; Vision</b>	<b>7</b>
<b>Strategy &amp; Operations</b>	<b>7</b>
<b>2021 Goals Accomplished in 2022</b>	<b>8</b>
<b>CHAMP 2022 Accomplishments</b>	<b>15</b>
<b>Research &amp; Scholarship</b>	<b>15</b>
Physical Fitness and Musculoskeletal Injury	15
Nutrition and Dietary Supplements	18
Psychological, Social & Spiritual Fitness	20
Integrative Health and Technology	20
Environment	22
<b>Education &amp; Training</b>	<b>23</b>
Human Performance Resources by CHAMP (HPRC)	23
Dietary Supplements & Operation Supplement Safety (OPSS)	29
<b>Leadership</b>	<b>31</b>
CHAMP Clinical Consultations	31
WHEC on HPRC	32
Dietary Supplements & Operation Supplement Safety (OPSS)	32
<b>Operational Support</b>	<b>33</b>
HPO & TFF Future Operations	33
Consultative Services and In-depth Resource Requests	33
<b>Internal CHAMP Activities</b>	<b>34</b>
CHAMP Intranet & Newsletter	34
CHAMP Retreat	34
HPRC Listening Sessions	34
CHAMP Internship Program	34
CHAMP Diversity, Equity & Inclusion (DEI) Work Group	35
<b>2022 Publications, Posters &amp; Presentations</b>	<b>36</b>
<b>Partners &amp; Collaborators</b>	<b>43</b>
<b>CHAMP Goals for 2023</b>	<b>45</b>

# Executive Director's Letter

In the last annual report, we talked about 2021 as being a year of transition, but 2022 was even more so. Everything happens for a reason, and there's no doubt that the Consortium for Health and Military Performance (CHAMP) at the Uniformed Services University of the Health Sciences (USU) is the key Department of Defense (DoD) resource for Human Performance Optimization (HPO) and Total Force Fitness (TFF). In April of 2022, I stepped back in to lead CHAMP. And although it was not in my game plan, I'm very happy I did because I witnessed how CHAMP grows in value to USU, the Military Health System (MHS), DoD, and our nation every year—the reason: our amazing team of CHAMPions.

The year 2022 was particularly important because we hosted two days of strategic planning, where we came together to think big and think forward. We updated our mission and vision statements and added a fourth and much-needed functional pillar—Operational Support. The 2022 Annual Report highlights several CHAMP key accomplishments across all four pillars, and the efforts of a group of special people—all working towards the same mission with a shared vision of providing Service Members the best evidence-based HPO products and resources.

One huge event was the signing of DoDI 6130.06 – “Use of Dietary Supplements in the DoD.” It took almost ten years to finalize this document, and it names CHAMP's Operation Supplement Safety (OPSS) as the DoD program for dietary supplements. Another highlight was our field testing of the long-awaited Military Nutrition Environment Assessment Tool (mNEAT) app and the tremendous interest across the nation for our military nutrition environment (MNE) programs. Two other amazing accomplishments were the delivery of the first Military HPO/TFF Integrators curriculum to the Army National Guard and our sponsoring of a Total Force Fitness to Whole Health Summit with Veterans Affairs. Finally, CAPT J. Russell Linderman, better known as “Crazy Juice,” joined our team as Deputy Director and has been a most welcome addition to CHAMP.

I continue to be awed by how the CHAMP team builds thriving and deep relationships with our stakeholders, colleagues, and federal partners. CHAMP is grateful for the opportunity to support USU, Service Members and their families, MHS, DoD, and our nation. Stay with us to see how 2023 unfolds: What I do know is that CHAMP will continue to be a world-class leader in HPO and TFF.



**Patricia A. Deuster, PhD, MPH**

Acting Executive Director, Consortium for Health and Military Performance

# CHAMP Leadership



TOP ROW  
(L TO R)

**Patricia Deuster\*, PhD, MPH**  
Acting Executive Director

**Francis O'Connor\*, MD, MPH,  
COL (ret.)**  
Chief Medical Officer

SECOND FROM  
TOP (L TO R)

**CAPT J. Russell Linderman, PhD**  
Deputy Director

**Stacey Zeno\*, MBA, MS**  
Chief of Operations

**Carolyn Chou\*, CPA**  
Chief of Operations and  
Chief Financial Officer

SECOND FROM  
BOTTOM (L TO R)

**Preetha Abraham\*, MA, DoL**  
Director of Research and  
Scholarship

**Lauren Messina\*, PhD, LCMFT**  
Director of HPO  
Education and Training

**Sarah de la Motte\*, PhD, MPH, ATC**  
Director of Fitness and  
Injury Prevention

BOTTOM ROW  
(L TO R)

**Andrea Lindsey\*, MS**  
Director of Operation Supplement  
Safety and Senior Nutrition Scientist

**Gloria Park, PhD**  
Director of Performance  
Psychology

**Travis Lunasco\*, PsyD**  
Director of HPO/TFF  
Future Operations

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

# CHAMP Team

**Misty Adams,**  
Senior Technical Editor

**Elizabeth Alders\*,**  
Research Associate II

**Camila Almeida\*,**  
Staff Scientist

**Cindy Astorino,**  
Senior Research Associate

**Amelia Barrett\*,**  
Project Manager I

**Stephanie Barrientos,**  
Clinical Research Coordinator

**Amy Blackford,**  
Study Coordinator

**Oscar Cabrera,**  
Assistant Professor

**Heather Calvert\*,**  
Administrative Assistant

**Francesca Cariello,**  
Staff Research Nurse

**Rachel Chamberlin\*,**  
Senior Anthropologist &  
CHAMP Qualitative Manager

**Yifan Chen\*,**  
Scientist

**Daniel Clifton\*,**  
Research Scientist

**Kristen Cofer,**  
Research Associate

**Micaiah Corley,**  
Education Specialist

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

**Carolyn Dartt\*,**  
Research Coordinator

**Shannon Davi,**  
Health and Exercise  
Coordinator

**Aiste Degesys,**  
HPRC Education &  
Production Administrator

**Daniel Edgeworth\*,**  
Clinical Research Coordinator I

**Anne-Marie Feinkeng,**  
Research Assistant

**Brooks Ford,**  
Performance Dietitian

**Jacqueline Forster,**  
Nutrition & Dietary Supple-  
ment Education Specialist

**Liam Friel,**  
Research Associate

**Alexandria Gregory,**  
Research Assistant

**Timothy Gribbin\*,**  
Senior Scientist

**Alaina Hansom,**  
Social Fitness Scientist II

**Jacob Harp\*,**  
Program Manager

**Jane Heetderks-Cox,**  
Research Coordinator II

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

**Sarah Hinman,**  
Research Assistant III

**Tammy Irelan\*,**  
Digital Manager

**Joshua Kazman\*,**  
Senior Biostatistician

**Jessica Kegel\*,**  
Biostatistician

**Katie Kirkpatrick\*,**  
Senior Environment  
Nutrition Manager

**Carolyn Kleinberger,**  
Research Associate I

**Kyung "Nancy" Kwon,**  
Clinical Research  
Coordinator II

**Salvatore Libretto\*,**  
Program Manager

**Shannon Mann,**  
Program Coordinator

**Shelley Mascia,**  
Editor

**Col Colleen McBratney,**  
Senior Advisor

**Rory McCarthy,**  
Qualitative Researcher

**Maria McConville,**  
Senior Nutrition  
Health Educator

**Beth McNally,**  
Research Technical Editor

**Lauren Meckelberg,**  
Program Coordinator

**Christiane Minnick\*,**  
Senior Graphic Artist

**Michael Mulry,**  
Culinary Nutritionist

**Craig Myatt,**  
Assistant Professor

**Chris Niewinski\*,**  
Multimedia Specialist

**Gabriel Paoletti,**  
Mental Fitness Scientist

**Kierra Parent,**  
Program Manager

**Yu Min Park,**  
Program Coordinator

**Corey Pegeus,**  
Health and Exercise  
Coordinator

**Sarah Poore,**  
Digital Strategist

**Melissa Reichley,**  
Senior Technical Editor

**Ming Qiang Ren\*,**  
Research Scientist II

**Emily Ricker,**  
Scientist I

**Melissa Rittenhouse\*,**  
Nutritionist Scientist

**Deborah Robinson,**  
Senior Research Associate

**Kylene Ruth,**  
**Lt Col, USAF (ret.),**  
Senior Advisor

**Nyamkhisig Sambuughin\*,**  
Senior Scientist

**Cynthia Savage,**  
Health and Exercise  
Coordinator

**Nicole Scarboro,**  
Scientist I

**Jonathan Scott\*,**  
Assistant Professor

**Ayanna Shivers\*,**  
Outreach &  
Communications Manager

**Michael Smuda,**  
Program Coordinator

**Carol Stockton\*,**  
Managing Editor

**Tiffany Taylor,**  
Research Coordinator II

**Gia Torpey\*,**  
Senior Editor

**John Tra,**  
Biostatistician

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

**Lindsay Vander Molen,**  
Nutrition & Dietary Supplement  
Education Specialist

**Abraham Walter\*,**  
Nutrition Education Specialist

**Andrew Young,**  
Senior Nutrition Physiologist

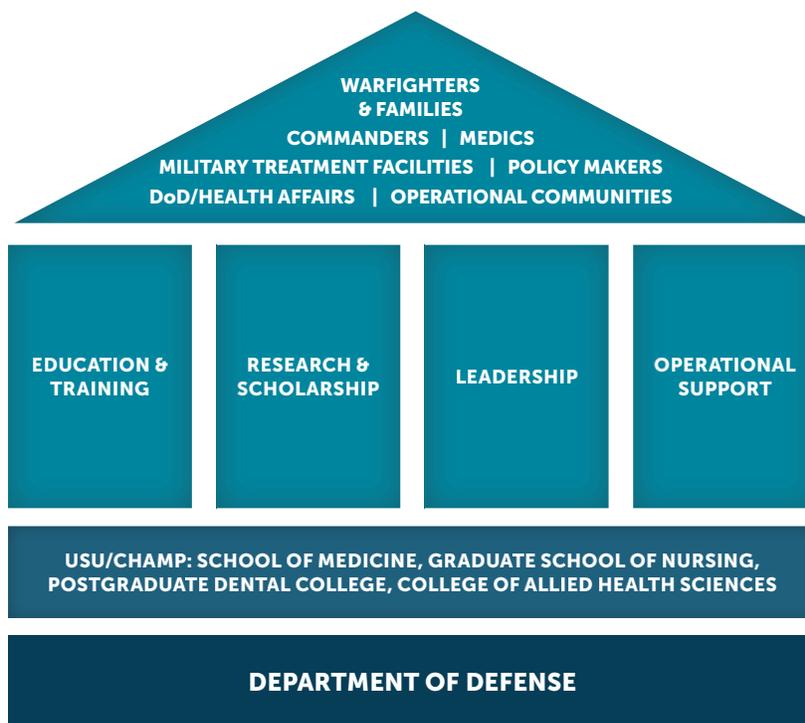
**Tianzheng Yu\*,**  
Research Scientist I

# Mission & Vision

The Consortium for Health and Military Performance (CHAMP) is the premier Department of Defense (DoD) readiness resource for Human Performance Optimization (HPO) across the Total Force Fitness (TFF) domains in support of DoD operations. CHAMP aims to expand HPO collaborations with federal partnerships, uniting efforts to improve the performance and resilience of Service Members and their families.

# Strategy & Operations

CHAMP was immersed in strategy throughout the year as we hosted two strategic planning events with senior CHAMP members and trusted advisors to update vision and mission statements. We set new strategic objectives along with clear, tactical short- and long-term initiatives. Furthermore, we established a fourth functional pillar—**Operational Support**—representative of our extensive collaborations and partnerships with military units, installations, and joint Services. With a clear strategy for CHAMP, we plan to modify internal and external operations by instituting a Performance Improvement Cell (PIC). This PIC will look at how we can improve our communications, processes, and procedures in an effort to be more effective and efficient across all four pillars. Finally, a Deputy Director tasked with federal responsibilities was added to the Executive Leadership team this year. We look forward to reaping the benefits of our improvements in 2023.



# 2021 Goals Accomplished in 2022



## GOAL

Begin identifying leading indicators of Warfighter readiness by analyzing large military databases.



## ACCOMPLISHMENTS

Using population health analyses, CHAMP examined the impacts of health indicators on readiness among large Army cohorts (more than 700K Soldiers). Specifically, we examined the longitudinal effects of health behaviors and psychosocial traits (from the Global Assessment Tool) on profile status, as well as bi-directional associations between incidents of back pain and mental health disorders and their joint longitudinal effects on service separation. We also examined how surgical management of common musculoskeletal conditions is associated with operational readiness, physical readiness, and service separation. See the Psychological, Social & Spiritual Fitness section for additional details.



## GOAL

Field-test the new Military Nutrition Environment Assessment Tool (mNEAT) application and Go for Green® (G4G) recipes to improve the military nutrition environment.



## ACCOMPLISHMENTS

CHAMP successfully completed a pilot study of the mNEAT web-based app to assess the local military nutrition environment (MNE) and developed an action plan for food service venue improvement at one Joint Base and four Service installations. A second study is in progress at seven Navy installations to test the mNEAT app and MNE improvement process. G4G interventions included optimizing high-performance foods through improved recipes and menus. The G4G team's research is ongoing to assist and evaluate G4G 2.0 implementation in military dining facilities at five pilot sites (with two sites completed in 2022). See the Nutrition and Dietary Supplements section for additional information.



## GOAL

Conduct Phase 1, 2, and 3 analyses of Capability-Based Blueprints (CBB) to demonstrate return on investment (ROI) and export as a model for Warfighter readiness.



## ACCOMPLISHMENTS

CBB is a 3-phase process to (1) map career-field/unit performance and health requirements, (2) realign service delivery and programming to those requirements, and (3) validate the return on investment of realignment activities. The HPO Future Operations Team completed Phase 1 with members of the USAF 2W1 Aircraft Armament System Technicians career field assigned to the 388<sup>th</sup> Maintenance Group at Hill AFB and has transitioned to Phase 2. In addition, our team is completing Phase 1 with 2W1s in the 366<sup>th</sup> Maintenance Group at Mountain Home AFB, with realignment efforts planned for early 2023. More information can be found in the Operational Support section.



**GOAL**

Evaluate the efficacy of musculoskeletal (MSK) programs, policies, and practices across DoD to improve the prevention and treatment of MSK injuries.

**ACCOMPLISHMENTS**

CHAMP's Injury Prevention Research Laboratory (IPRL) is conducting five ongoing projects and has two newly-funded studies that evaluate the effectiveness of musculoskeletal injury (MSK-I) prevention and/or treatment programs and practices across DoD. This work evaluates risk factors and interventions for MSK-I in the U.S. Marine Corps, U.S. Army, and U.S. Navy, as well as treatment of MSK-I by DoD and U.S. Department of Veterans Affairs (VA) providers. See the Research & Scholarship section for additional details.

**GOAL**

Continue research on the Exercise Collapse Associated with Sick Cell Trait (ECAST) project for improved biologic and clinical markers and management at point of event.

**ACCOMPLISHMENTS**

Studies for the ECAST project are underway, and we anticipate completion in 2023.

**GOAL**

Develop the current high-risk criteria for Exertion Related Injuries (ERI) recurrence into a scoring system to optimize return to duty.

**ACCOMPLISHMENTS**

Enrollment is ongoing at USU, Ft. Bragg, Ft. Benning, and Marine Corps Base Quantico, and we are more than 40% of the way to our goal of 500 participants. In 2022, we added four sites (Camp Pendleton, Camp Lejeune, Ft. Belvoir, and Paris Island) to the protocol and are working to get those sites ready for enrollment. In addition, our team has been analyzing the participant data to identify key clinical indicators for predicting the likelihood of ERI recurrence.

**GOAL**

Expand and solidify additional military, federal, and civilian partners and continue collaborating with partner organizations to broaden and strengthen CHAMP's footprint in HPO/TFF across DoD.

**ACCOMPLISHMENTS**

The Human Performance Resources by CHAMP (HPRC) team expanded its reach to four new audiences along with presentations to various National Guard states. In addition, we collaborated with multiple partners to produce educational materials on sleep readiness, stress management, nutritional fitness, and more. The Operation Supplement Safety (OPSS) team continued to work with the Force Fitness Instructor (FFI) course at USMC Base Quantico, Virginia, by reviewing and contributing content on the topic of dietary supplements and providing two presentations to FFI participants. The OPSS team also completed a systematic review of dietary supplement ingredients with market claims related to immune health and participated in an expert panel involving stakeholders within the military, federal, and civilian sectors in collaboration with the Office of Dietary Supplements at the National Institutes of Health (NIH). See the Education & Training section for details about these collaborative efforts.





**GOAL**

Develop a line of research and education products focused on advancing the quality of Human Performance Team (HPT) practitioners across DoD.



**ACCOMPLISHMENTS**

The HPRC team continued to create worksheets and resources that HPT practitioners could use directly with Service Members, including the "TFF Self-Check," "Total Force Fitness Inventory," "Physical Fitness Handbook," and "Strategic Habits Workbook: 20 Habit Hacks to Help You Build Good Habits."



**GOAL**

Deliver HPO/TFF curricula.



**ACCOMPLISHMENTS**

In September, HPRC team members delivered the inaugural Military Health and Performance Optimization-Integrator (MHPO-I) Basic Course to approximately 70 National Guard members at the National Guard Professional Education Center (PEC) in Little Rock, Arkansas. It is the first of its kind, and is directly in line with our mission to enhance Warfighter readiness through evidence-based Human Performance Optimization knowledge, guidance, and operational support. Students learned the basics of mental, physical, nutritional, spiritual, and sleep readiness as well as core skills to function as an Integrator within their units. The MHPO-I role utilizes basic knowledge in TFF to engage in informed health and performance conversations with fellow National Guard members, deploy coaching skills to mobilize health and performance goals, and make effective referrals and connections to evidence-based resources. The HPRC team is looking forward to delivering its second iteration of the course in August 2023 and aims to expand its reach to the Air Guard, Army Reserves, and beyond.



**GOAL**

Expand marketing of HPRC and OPSS websites.



**ACCOMPLISHMENTS**

To boost marketing efforts, six HPRC commercials were created and shared on the Armed Forces Network (more than 100K plays in the U.S. and overseas), Defense Visual Information Distribution Service (DVIDS), and YouTube. The HPRC team also created a bookmark to quickly and simply showcase that HPRC is a trusted resource for TFF information. We also used paid social media promotion to attract active-duty Service Members and students in military universities and academies. Through ongoing ads that directed viewers to the HPRC website and social media posts, more than 600K impressions were gained around sleep, brain health, and other educational topics.



**GOAL**

Deliver publicly available presentations to all military audiences.

**ACCOMPLISHMENTS**

The HPRC team delivered TFF and HPO presentations to new and familiar military audiences worldwide—from the National Defense University to Service Members stationed at Al Asad Air Base, Iraq. Alongside the National Guard PEC, the HPRC team also hosted a series of Leadership Professional Development wellness presentations, which were delivered virtually, live, and streamed on Facebook. The HPRC team played a big role in organizing CHAMP’s contributions to USU’s Health and Wellness Fair as well. HPRC, OPSS, and Research team members staffed three tables and hosted activities related to TFF, nutrition, and physical fitness.

**GOAL**

Revise Rehab, Refit, Return to Duty (Rx3) content and create new modules.

**ACCOMPLISHMENTS**

The Rx3 team reviewed and revised existing content, updated and developed new Clinical Decision Guides for medical providers, and helped produce new videos for each of the 100+ exercises. See the Research & Scholarship section for additional details.

**GOAL**

Finalize the OPSSup app in preparation for release into the marketplace.

**ACCOMPLISHMENTS**

After an unforeseen pause in development, the OPSS team resumed work on the source coding, design, and components of the OPSSup app with the goal of completion in 2024.

**GOAL**

Complete the OPSS online dietary supplement education module for health professionals.

**ACCOMPLISHMENTS**

After an unforeseen pause in development, the OPSS team resumed work on content for the module, with completion targeted for 2024.

**GOAL**

Deliver and maintain the *DoD Prohibited Dietary Supplement Ingredients List* on the OPSS website, as mandated by DoDI 6130.06: “Use of Dietary Supplements in the DoD.”

**ACCOMPLISHMENTS**

A list of more than 800 DoD-prohibited substances (along with “other terms” for a total of more than 4,500 entries) was added to the OPSS website, and the OPSS team continues to maintain and update the list as needed. For more information, see the Dietary Supplements & Operation Supplement Safety (OPSS) section.



**GOAL**

As mandated by DoDI 6130.06, continue to provide dietary supplement education for Service Members, healthcare personnel, and allied health professionals across the military community.



**ACCOMPLISHMENTS**

The OPSS team gave 54 educational presentations to participants across DoD and the greater healthcare-provider community, and at professional conferences. OPSS will work to provide openly available educational trainings in 2023.



**GOAL**

Increase exposure of all content across websites and social media platforms.



**ACCOMPLISHMENTS**

Across all CHAMP educational social media platforms, CHAMP reached 16,000 subscribers (53% increase from 2021), achieved 1.3M impressions (300% increase), and received 20K engagements (26% increase). The HPRC and OPSS websites gained a combined 1.8M pageviews, with HPRC garnering more than 1M.



**GOAL**

Begin designing a “just-in-time” embedded curriculum.



**ACCOMPLISHMENTS**

In a CHAMP collaboration, HPRC, CBB, and Psycho-Social-Spiritual team members collaborated to conceptualize modules for a “just-in-time” embedded curriculum for human performance professionals new to working with the military. While the need for this curriculum remains strong, funding outlets have not been secured to develop the full curriculum, so efforts paused in 2022.



**GOAL**

Host a 2<sup>nd</sup> Total Force Fitness Summit.



**ACCOMPLISHMENTS**

In collaboration with the Veterans Health Administration Office of Patient-Centered Care and Cultural Transformation, CHAMP hosted the Total Force Fitness to Whole Health (TFF-WH) summit at USU. The overall goal was to promote our shared mission of optimizing the health and well-being of our Service Members and Veterans across their lifecycles. The hybrid virtual and in-person event was a great success, with more than 300 participants.





**GOAL**

Host a 3<sup>rd</sup> Performance Psychology Summit.



**ACCOMPLISHMENTS**

Because CHAMP hosted two TFF and TFF-WH summits this year, there was no 3<sup>rd</sup> Performance Psychology Summit. A consensus paper titled, "Advancing the Practice of Contemporary Military Performance Psychology" was published in the Spring 2022 edition of the *Journal of Special Operations Medicine (JSOM)*. The paper is a product of both the 2018 and 2020 Performance Psychology Summits and outlines the key takeaways for military practice.



**GOAL**

Establish the Joint Exertion-Related Event Collaborative.



**ACCOMPLISHMENTS**

Chief Medical Officer Dr. Francis O'Connor worked with Joint Trauma System (JTS) leaders to brief both Defense Health Agency (DHA) and Joint Staff leadership at the MEDOPSDep level on the concept of moving the Army-funded Warrior Heat- and Exertion-Related Events Collaborative (WHEC) to a joint-funded initiative. The intention is to form a Joint Exertional Illness Initiative in conjunction with the potential expansion of JTS to a Joint Casualty Care System. While the concept was endorsed and supported, the path forward has yet to be determined, as strategic alignments within DHA continue to evolve.



**GOAL**

Support internal staff during uncertain times.



**ACCOMPLISHMENTS**

To provide better work-life balance and develop a sense of fellowship among our CHAMPions, we instituted a number of actions and held a variety of activities. First, we gave staff the opportunity to work from home and approved all requests for staff and supervisor trainings. Importantly, staff were encouraged to take time off for their mental health. During monthly CHAMP meetings, we held group activities to allow geographically dispersed staff to connect. In addition, we held a CHAMP team retreat, holiday party, lunch get-togethers, and a number of other events to ensure positive working relationships within and across teams.



**GOAL**

Streamline the collection of internal metrics to improve efficiency and effectiveness.



**ACCOMPLISHMENTS**

The HPRC and OPSS teams transitioned to a team-based approach for collecting internal metrics to enable each team to have more oversight of the data being collected, to be able to cross-check metrics with other tracking strategies, and to be able to produce reports on the team's effectiveness more efficiently.





**GOAL**

Begin adopting a more systems-focused approach to bridge CHAMP projects across all HPO/TFF domains and functional areas (education, research, and leadership) over the next three years.



**ACCOMPLISHMENTS**

HPRC team members actively consulted with and participated in projects across CHAMP. Some examples are included below.

- ▶ The HPRC team worked with CHAMP’s Psycho-Social-Spiritual team to publish the SSFS 7 x 7 Initiative on the HPRC website. This effort included publishing an overview of the SOCOM Spiritual Fitness Scale, a resource book about the scale, and several videos about how the scale was designed, scored, and other details.
- ▶ Tim Gribbin of HPRC collaborated with members of the IPRL team to deliver an MSK evaluation workshop to USU nurse practitioners.
- ▶ The HPRC team joined up with members of the Psycho-Social-Spiritual team to begin work on a JSOM article on social fitness definitions in the military.
- ▶ HPRC and OPSS team members presented on nutrition and dietary supplement safety to state coordinators for the Building Healthy Military Communities (BHMC) project.
- ▶ HPRC content leads continued to use CHAMP research articles as sources in content published on HPRC-online.org.



# CHAMP 2022 Accomplishments

## [ RESEARCH & SCHOLARSHIP ]

### Physical Fitness and Musculoskeletal Injury

#### Joint Incentive Fund with the Injury Prevention Research Laboratory (IPRL)

IPRL continued work on five research studies and obtained funding for two more research studies aimed towards identifying and/or mitigating risk factors for MSK-I in Service Members. In addition, 3 of our previous MSK-I publications were referenced by the RAND Corporation in the “2022 Independent Review of the Army Combat Fitness Test: Summary of Key Findings and Recommendations” report for reducing preventable injuries.

Throughout the year, IPRL members attended five conferences and presented on multiple projects.

- ▶ Aerospace Medical Association Annual Scientific Meeting (Reno, Nevada)
- ▶ American College of Sports Medicine Annual Meeting (San Diego, California)
- ▶ National Athletic Trainers’ Association Annual Meeting (Philadelphia, Pennsylvania)
- ▶ Military Health Systems Research Symposium (Kissimmee, Florida)
- ▶ Association for Behavioral and Cognitive Therapy Convention (New York, New York)

In April, five IPRL team members attended the Dayton, Virginia, Musculoskeletal Training Program for Women’s Health Primary Care Providers in support of the Active Duty and Veterans’ Holistic Musculoskeletal Management and Enhancement (ADVet-HOMME) program. Then they conducted their first joint DoD-VA musculoskeletal training course in September at the Henry M. Jackson Foundation (HJF) headquarters in Bethesda, Maryland. The 3-day course was attended by 22 primary-care providers from both the VA and DoD and aimed to improve

attendees’ musculoskeletal injury assessment and treatment knowledge and skills. The attendees shared positive course reviews, with most feeling significantly more confident in assessing, diagnosing, and treating common MSK-I following the course. Our goal is to train 10–15 more DoD providers next year.

The ADVet-HOMME project is now enrolling patients into the virtual ADVet-HOMME platform. The trained providers refer patients to the platform hosted on HPRC’s website. Health and education coordinators on the ADVet-HOMME team guide patients through home-based rehabilitation using the Rx3 program, specifically for MSK-I of the shoulder, back, hip, and knee. In addition, the IPRL team obtained IRB approval to evaluate the delivery, learning efficacy, and satisfaction levels for the ADVet-HOMME program from both provider and patient perspectives. The assessment for the provider will include outcomes from the MSK-I training and satisfaction with the virtual platform, whereas the patient assessment will cover the rehabilitation process, as well as program and provider satisfaction. Data collection and subsequent analysis will continue through 2023.

Additional IPRL education outreach efforts included lectures for USU Sports Medicine Fellows on MSK-I epidemiology, biomechanics, exercise physiology, and the female athlete triad. IPRL staff also provided a lecture and lab session with the USU Graduate School of Nursing Family Nurse Practitioner program to introduce musculoskeletal exam skills to students. In addition, CHAMP and the Defense Centers for Public Health – Aberdeen (DCPH-A; formerly the U.S. Army Public Health Center) co-led the Military Injury Prevention Research to Practice Education Series. Drs. Sarah de la Motte and Daniel Clifton



worked with the DCPH-A team to identify speakers and schedule this continuing education series for military providers and staff covering injury prevention, health promotion, and Human Performance Optimization topics, which continues into 2023.

**Proteomics of Stress Fracture**

The IPRL team collaborated with Keller Army Community Hospital and the Women’s Health Integrated Research Center at Inova Health System on a Proteomics of Stress Fracture project. The study uses serum samples previously collected from U.S. Military Academy (USMA) cadets along with biomechanics data from a jump-landing task to assess stress-fracture risks. The IPRL team aims to complete data analysis in 2023 to determine whether the serum proteomic profiles of cadets differ between those who sustain a stress fracture and those who don’t during their first year at USMA.

**Initiation of Marine Physiological Assessment of Combat Training (IMPACT)**

The IPRL team continued data analysis for the IMPACT project, conducted at The Basic School (TBS) at Marine Corps Base Quantico from 2017 to 2019. The goal of IMPACT was to characterize successful officer graduates from the Basic Officer Course at TBS by investigating how MSK-I, nutrition status, biomechanics of movement, and psychosocial factors can contribute to their early career outcomes. The IPRL team plans to present a report of their findings to TBS Command in 2023 prior to preparing numerous manuscripts.



**Reducing Injuries with Training Enhancement, Targeted Rehabilitation, and Core Conditioning (RITE-TRACC II) at U.S. Marine Corps West Coast Entry Level Training**

In May, the IPRL team began enrollment for an MSK-I study on the effects of a targeted injury reduction program at RITE-TRACC II at Camp Pendleton, California. This project aims to identify barriers to prompt reporting of MSK-I in training Marines and their instructors, and will assess the impact of an injury-prevention education intervention on care-seeking for injuries during training. In addition, we plan to study the impact of embedding a certified athletic trainer (AT) into training on MSK-I rates, training outcomes, and MSK-I reporting. The AT will be embedded at the unit level in early 2023 and will work closely with infantry training instructors, command staff, and medical providers to provide medical care.

## Predicting and Preventing Back Pain in Aircrew

In October, the IPRL team began enrollment and data collection for a study on predicting and preventing back pain in aircrew at Naval Air Station Patuxent River, Maryland. The IPRL team is collaborating with The Ohio State University Spine Research Institute (OSU-SRI) to use a novel device (Conity System) to characterize spine kinematics in military aircrew. We will combine the kinematic data with information from health questionnaires to explore factors related to self-reported low-back pain. In addition, the Conity System will be used in a two-year project funded by OSU-SRI to study low-back and neck function and pain in Service Members for the Air Force Research Laboratory.

## U.S. Army Master Fitness Trainer Impact

Dr. Daniel Clifton received a Military Operational Medical Research Program (JPC-5) grant for a study on factors associated with U.S. Army Master Fitness Trainer (MFT) impact on MSK-I and physical readiness. This three-year project is a collaboration with the U.S. Army Research Institute for Environmental Medicine and the U.S. Army Physical Fitness School (USAPFS) to assess the impact of Army MFTs on MSK-I outcomes and physical fitness. Project results will inform strategies for increasing the use of MFTs by improving leadership's understanding of MFTs and providing feedback on the knowledge, characteristics, and use of MFTs that will shape future MFT curricula.

## Hormonal Contraceptive Use and Stress Fracture Risk

Dr. Emily Ricker received a JPC-5 grant for a study on hormonal contraceptive use and stress fracture risk during entry-level military training. The project aims to leverage an existing large-scale military health database to assess the relationship between different routes of hormonal contraception administration on stress-fracture incidence in early-career (first 6 and 18 months of service) female Service Members. In addition, the relationship between routes of hormonal contraceptive administration

and military separation will be examined in those with a stress-fracture diagnosis. The results will inform evidence-based recommendations about contraception use with respect to female Service Member musculoskeletal health.

## Musculoskeletal Outcomes and Readiness Project (MORE)

In the fourth year of the MORE project, we continue to expand the Medical Assessment and Readiness System (MARS) dataset at Womack Army Medical Center (WAMC) to include updated extracts of administrative and medical records of active-duty Service Members who served from 2011 to present. Further, agreements with several branches were established to share branch-specific readiness metrics, behavioral-health survey data, and Special Operations/Warfare data.

The MORE team conducted multiple analyses on these resources to develop deliverables (e.g., peer-reviewed articles, abstracts, and presentations) for the Office of the Assistant Secretary of Defense – Health Affairs (OASD-HA) in support of decision-making on best practices in the Military Health System. Topics in these analyses included the impact (e.g., medical and financial) of specialty providers (e.g., athletic trainers, physical therapists, and orthopedic surgeons) in training and non-training military settings; rates and risk factors for symptomatic hallux valgus; risk of suffering from a musculoskeletal condition after a concussion; longitudinal associations between back pain and mental health disorder/symptoms; and outcomes following surgical management of common musculoskeletal conditions (e.g., clavicle fractures, chronic exertional compartment syndrome, and inguinal hernias). Ongoing efforts include translating the analytical findings to journal publications, completing administrative and technical efforts for expanding the MARS dataset at WAMC to the total active U.S. military (including both conventional and Special Operations Forces), and establishing multi-Service collaborative relationships for larger population analyses.



[ RESEARCH & SCHOLARSHIP ]

## Nutrition and Dietary Supplements



### Military Nutrition Environment, Go for Green® & mNEAT

Efforts to optimize the military nutrition environment focus on improving access to performance-focused foods and beverages using both research and education lines of effort. CHAMP manages the new mNEAT web-based application, which is available for DoD users to assess an installation or ship's food environment. Currently, there are 300 users and 1,683 completed assessments across all Services. CHAMP is evaluating the mNEAT evaluation process through research pilot studies (one completed; one in progress) with study sites representing five Service branches and one Joint Base.

CHAMP provided Go for Green® (G4G) 2.0 program consultations for planning, implementation, and maintenance to 163 military dining venues across DoD. In addition, 666 users completed G4G 2.0 training hosted by CHAMP. The G4G program was also highlighted in the "White House National Strategy on Hunger, Nutrition, and Health" (September 2022) under the "empower all consumers to make and have access to healthy choices" pillar. Part of the White House strategy involves expanding access to healthier food environments in federal facilities, including expansion of the G4G program and limitation of marketing to meet G4G nutrition standards.

### G4G Station-style Dining

CHAMP continued to work with an Army dining facility to implement and evaluate G4G station-style dining to provide a variety of customizable meals. Current efforts include education and marketing to highlight high-performance choices.

### Immune Health

In collaboration with the Office of Dietary Supplements at the National Institutes of Health, CHAMP conducted a systematic review of dietary supplement ingredients with market claims related to immune health within the context of resilience. Content analysis was performed across select products to determine whether product labels are consistent and accurate. This article was mentioned in more than 300 tweets reaching more than 1.2 million Twitter followers. An expert panel convened to prioritize future research directions. Deliverables include two peer-reviewed articles and one currently undergoing peer review. Educational materials—including OPSS.org website articles, an immune health guide, handouts, a series of



podcasts involving diverse stakeholders and expert panelists, and social media posts—are forthcoming in early 2023.

## Herbs & Spices

Dietary patterns among active-duty Service Members do not meet the Dietary Guidelines for Americans (DGA) and can contribute to negative health outcomes, directly impacting mission readiness. Service Members report high consumption of sugar-sweetened beverages and lower-than-recommended intake of several DGA parameters. For instance, only 12.9% of Service Members meet the recommended vegetable intake. The goal of this project is to evaluate whether the addition of spices and herbs to vegetables (compared to vegetables without spices and herbs) can increase vegetable intake among junior enlisted Service Members. In July, the study protocol was approved, and in October, a service agreement with HJF and Pennington Biomedical Research Center was executed. This agreement allows for the use of a novel food-photography mobile application to estimate vegetable consumption. In December, we conducted the first iteration of monadic sensory testing with McCormick food scientists and chefs to taste-test vegetable recipes with and without spices and herbs at the United Services Organization at Naval Support Activity Bethesda. We are looking forward to wrapping up the study next year.



## Omega-3 Index

The Omega-3 Index project looks at different food and beverage options to improve omega-3 fatty acid (omega-3) levels in Service Members. In 2022, a 12-week study was conducted at three U.S. Service Academies (Navy, Army, and Air Force) and provided different levels of omega-3s in fish and smoothie options to identify which options increase their omega-3 index levels. Data collection for the study is complete and data analysis is underway. Study results are being prepared for publication and for presentation at key scientific conferences.

## Dietary Ingredients on Heat Stress

The dietary ingredients project funded by the NIH Office of Dietary Supplements is currently in Phase 2. In Phase 1, we identified several dietary ingredients that have the potential to protect skeletal muscle against heat injuries and produced three scientific publications in 2022. In Phase 2, we propose to test the efficacies of three dietary ingredients (astaxanthin, curcumin, and nicotinamide riboside) on mitochondrial  $Mg^{2+}$  homeostasis in mouse skeletal muscle in response to acute heat stress. In addition, we aim to verify the protective effects of these dietary ingredients on the small intestine and kidneys that are specifically vulnerable to heat injury. These studies are ongoing.



## [ RESEARCH & SCHOLARSHIP ]

# Psychological, Social & Spiritual Fitness

### Human Performance Team (HPT)

CHAMP's Psycho-Social-Spiritual team continued its work with the military communities to advance human performance and spiritual fitness. Team members were invited to host two panels on intersections among psycho-social-spiritual fitness at American Psychological Association Division 19 (Society for Military Psychology) meetings. For the HPT study, the team finished collecting qualitative focus-group data for a multi-disciplinary collaboration among DoD TFF/HPO practitioners (e.g., athletic trainers, operational psychologists, and chaplains). Preliminary study findings will be presented at the AMSUS conference in 2023, and further findings and practical guidance will be presented in other academic and industry forums. Individual and team-based characteristics of HPTs and their impact on quality of care and outcomes for Service Members will continue to be an area

of study next year, starting with MSK-I providers and practitioners.

### Evidence-based Spiritual Fitness

The project is an ongoing collaboration with the Marine Corps' Teaching and Education Command with the goal of understanding psycho-social-spiritual fitness and developing evidence-based spiritual fitness programs for Marines. We aim to establish a rich, detailed comprehension of Marine spiritual fitness, as well as a more generalizable understanding, to proceed with efficient and effective programming. To do this, Psycho-Social-Spiritual team members designed a project with both qualitative and quantitative methods that will be executed in 2023.

# Integrative Health and Technology

### Special Operations Assessment, Baseline, Readiness and Evaluation System (SABRES)

The SABRES project is a pilot study intended to help U.S. Special Operations Command better understand how to assess Service Members at the point of entry into Special Operations Forces and then periodically monitor them over the course of their careers to ensure that performance is maintained or improves, and to intervene when it decreases. Baseline measures and metrics currently include objective neurocognitive assessments and self-report data related to each domain of human performance readiness (spiritual, social and family, psychological, cognitive, and physical fitness). CHAMP is currently assisting the U.S. Marine Corps Special Operations Command (MARSOC) with Phase 2 of this effort, to conduct preliminary analyses of the de-identi-

fied available secondary data resulting from the baseline measures and metrics used throughout the pilot with MARSOC. The objective is to describe patterns and trends within and across the current SABRES measures. In September, a data-use agreement was approved by USU and MARSOC and the data were transferred. Data analysis is ongoing and expected to be complete in March of 2023. In addition, CHAMP is performing a scoping review to identify additional measures, metrics, and predictive indicators that could be considered for future iterations of SABRES. The study findings are intended to inform MARSOC about best practices and applicable metrics relating to human performance readiness for SABRES implementation.

### Technology Enhanced Mobile Platform for Performance Optimization (TEMPPO)

The TEMPPO application aims to provide Army National Guard (ARNG) Soldiers with an accessible tool to help improve fitness and readiness. In February, the team secured an IT vendor contract (TITUS/SPEAR) for TEMPPO app development and partnered with Holistic Health and Fitness (H2F) coordinator, MAJ Ben Seims, for TEMPPO buy-in and LOIs from five ARNG pilot states (Georgia, Kansas, Minnesota, New Mexico, and Washington). A pilot study in all five states will inform the feasibility and acceptability of the TEMPPO app. In 2022, the Research team focused on study recruitment and enrollment using virtual meetings and has currently recruited 139 users. In August, social media and newsletters were added to the study recruitment methods, and in October, our TEMPPO social media recruitment campaign went live. Study recruitment, data collection, and analysis will continue into 2023.

### Building Healthy Military Communities (BHMC)

Phase 2 of the BHMC pilot program was completed in 2022. Overall, BHMC improved communication and collaboration among DoD, non-governmental organizations, community partners, and local government entities to positively impact the lives of Service Members, Veterans, and their families in nine pilot states. CHAMP team members provided program evaluation support throughout the BHMC program. In March, the team traveled to Arlington, Virginia, for the Annual BHMC planning meeting, and the study coordinator introduced the BHMC pilot in El Paso, Texas, in April. Throughout the year, the CHAMP and BHMC teams presented to multiple community partners, military organizations, and state government agencies to create buy-in for the BHMC pilot in the communities. In August, CHAMP completed the revised "BHMC Phase 1 Impact Report" and submitted a revised "Program Operating Plan Timeline Review" to DHA. The team then submitted a Phase 2 evaluation plan in October and completed the "Phase 2 Impact Report" in December. In addition, the CHAMP team submitted the BHMC summary for the "TFF Annual Report" to the Defense Centers for Public Health – Aberdeen (DCPH-A; formerly the U.S. Army Public Health Center), which was presented to Congress.

### Leading Indicators of Resilience Among Soldiers (LIRS)

The LIRS project looks for trends and associations among health indicators, locations, and readiness/retention in baseline data of Army Fitness compiled by the Global Assessment Tool (GAT). In 2022, the project produced three analysis products for the *Military Psychology* journal, a USU Research Days presentation and publication in progress, and the BHMC program. By using Army readiness and retention outcomes in longitudinal studies, these analyses are intended to uncover protective traits for Service Members. These traits might be targeted in future interventions, integrated into readiness surveillance systems, or applied as leading sub-clinical indicators of readiness. Based on synergies across CHAMP projects and outside interest in GAT data, we added another analyst to assist with analysis requests, including requests from USU students working on dissertations.



[ RESEARCH & SCHOLARSHIP ]

## Environment

### Exertion-Related Injuries (ERI)

The ERI study aims to determine molecular subtypes of ERI and develop a differential diagnosis framework to assist providers in determining the risk of recurrence following an ERI among Service Members to optimize return-to-duty determinations. In 2022, we expanded our enrollment sites from 4 to 9 and reached 43% of our participant goal (n = 500). In addition, we set up a direct referral network for enrollment of Service Members from the U.S. Naval Academy, Ft. Hood, Joint Base Lewis-McChord, U.S. Military Academy, Ft. Campbell, Ft. Knox, Ft. Jackson, and Ft. Drum. Throughout 2022, study findings on malignant hyperthermia biological mechanisms, exertional illness prevention, and exertional collapse in athletes were presented at scientific meetings. We aim to complete enrollment and data collection in 2023.

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

ECAST in Warfighters is a significant problem confronting military medicine. Currently, there are no evidence-based guidelines to assist healthcare providers with the management and disposition of Warfighters with ECAST. The overall goal of this project is to determine which biological markers can be used to identify ECAST risk and whether any markers can be used in risk stratification for patient susceptibility. The project protocol was approved and the enrollment process has begun. We aim to complete patient enrollment, conduct testing, and perform data analysis in 2023.



[ EDUCATION & TRAINING ]

# Human Performance Resources by CHAMP (HPRC)

## Presentations & Virtual Events

The HPRC team completed many live presentations and virtual events in 2022. We engaged in several collaborative calls with the Wounded Warrior Project® to discuss how HPRC materials could benefit their audience and particularly the coaches they employ to deliver education to wounded Veterans. The HPRC team subsequently delivered two presentations directly to the coaches. One presentation was a general overview of CHAMP and HPRC, and the second was on spiritual fitness. The HPRC team also worked with the Department Head of Nursing Research and Consultation Services at Naval Medical Center Portsmouth to include information about HPO, TFF, and HPRC resources in a presentation delivered at the Junior Officer Symposium for 260 attendees. In addition, the HPRC team presented to multiple audiences.

- › 208<sup>th</sup> Medical Area Support Company (MCAS) at Al Asad Air Base, Iraq
- › Air Force Assistant Secretary's Office
- › American Psychological Association
- › Army Brigade Healthcare Provider Course
- › Army Division Surgeon Course
- › Commercial Litigation Center - Air Force
- › Executive Medical Department Enlisted Course (EMDEC)
- › F-15SA Fleet Modernization Program All-Hands Call
- › Ft. Jackson Master Resilience Trainer Schoolhouse
- › Grand Forks Air Force Base, North Dakota
- › Iowa National Guard First Line Leaders Course
- › Leadership Professional Development Series
- › National Defense University
- › Naval War College – AFLEX and IFLEX Series
- › Naval War College Faculty
- › New Mexico Army Reserve National Guard Holistic Integration Performance Workshop
- › North Dakota National Guard
- › PED Battalion
- › Professional Education Center H2F Summit
- › U.S. Army Reserve's 99<sup>th</sup> Readiness Division
- › USCG Wednesday Wellness
- › USU Faculty Assembly
- › USU School of Medicine Student Orientation
- › USU Sports Medicine Fellows
- › Womack Medical Center Ft. Bragg
- › Wounded Warrior Project® Coaching Program

**HPRC-online.org's most popular content in 2022:**

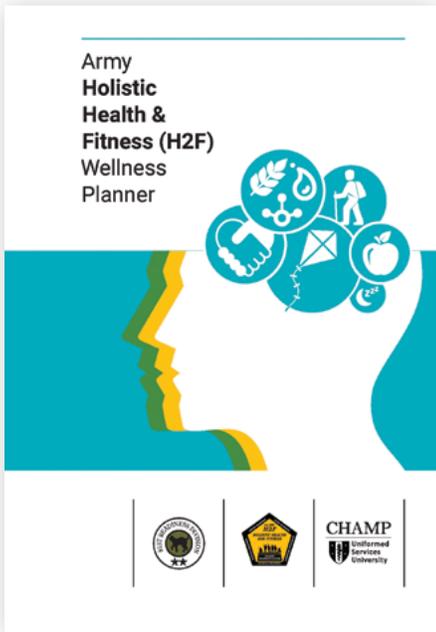
- MENTAL FITNESS**  
*Tactical breathing for the military*
- NUTRITIONAL FITNESS**  
*How can I eat to optimize my performance on night shift?*
- PHYSICAL FITNESS**  
*Rx3 – Phase 1  
Low-back pain program*
- SOCIAL FITNESS**  
*Are cell phones ruining family time?*
- TOTAL FORCE FITNESS**  
*Get Into Fighting Weight:  
A Total Force Fitness Guide*



### Rehab, Refit, Return to Duty (Rx3)

The Rx3 team began work on the update and expansion project in January. Existing content was reviewed and revised, and new components were developed, including a low-intensity “Phase 0” for all injuries, and for neck and upper-back pain, postpartum recovery, osteoarthritis, osteoporosis, balance, and core stability. We also updated and developed new Clinical Decision Guides for medical providers, which assist in determining if an injury requires diagnostic imaging or referral to a specialist, or if the injury can be managed with the Rx3 home-exercise programs.

For new Rx3 content, the team worked with Sound Films to produce new videos for each of the 100+ exercises, and we anticipate receiving those in early 2023. In addition, we are working with TIAG to develop an Rx3 app to help users complete the home-exercise programs and track their progress and pain levels. The app also will include a print-report feature for sharing progress with a user’s medical providers. We anticipate the updated Rx3 program and app will launch in July 2023, and we are planning a social media campaign for August 2023.



### Wellness Planners

The HPRC team developed a 26-week wellness planner for the 81<sup>st</sup> Readiness Division, Army Reserve, H2F program. The planner was designed to help Reserve Soldiers assess their current health and optimize their performance across the H2F pillars of mental readiness, sleep readiness, nutritional readiness, physical readiness, and spiritual readiness. In addition, a generic version of the wellness planner was created for use across the Services. Both planners follow a similar structure of having an intention-setting page, weekly tracker, and reflection for 26 weeks. For each week, users are asked to reflect on what they’re grateful for, what they’re focused on, what they need to prioritize, and which new food or habit they will try. Weekly tracking looks at sleep, energy, exercise, hydration, fruit and vegetable intake, whole-grain intake, social bonds, and spiritual wellness. The weekly reflection prompts users to think about what did and didn’t go well, and to set a goal for the next week.

## Campaigns

### #GotMySix

HPRC team members took a more deliberate approach to promote this year's #GotMySix campaign as a gratitude campaign. This direction helped the HPRC team successfully reach its goal of helping Service Members express thanks to those they can count on and "have their six." The HPRC team also included a third toolkit made available to partner organizations participating in the campaign. These included (1) a social media toolkit with social media messaging to post to support the campaign, (2) physical toolkits for partners to set up #GotMySix display boards, and (3) a pilot family toolkit with resources and tools to engage children in expressing gratitude. In addition, the HPRC team collaborated with the Association of the United States Army (AUSA) to contribute to "Gratitude: Why is it so important," an episode in AUSA's *Army Matters* podcast. In the September podcast, HPRC's Social Fitness Scientist Alaina Hansom discussed research that proves the benefits of showing gratitude and using our #GotMySix campaign.

#### Other campaign highlights:

- ▶ The HPRC team mailed 85 #GotMySix kits to 47 partners.
- ▶ There were 132 #GotMySix mentions across social media platforms.
- ▶ HPRC's social media reach peaked at 242K.
- ▶ Partner organizations (Ft. Belvoir Armed Forces Wellness Center and Ft. Meade Army Wellness Center) supported the campaign with their own social media #GotMySix posts.
- ▶ The family toolkit was downloaded 39 times.
- ▶ #GotMySix campaign information was emailed to more than 100 contacts.

### #HealthyRelationshipHabits

HPRC ran a social media campaign on healthy relationship habits from mid-January to mid-February. The theme was based on HPRC's "Top 5 healthy relationship habits" article and infographic, with each week focusing on one of five healthy relationship habits. Our team posted videos, photos, infographics, and HPRC articles—all using the "hashtag" #HealthyRelationshipHabits—on various social media platforms, including Facebook, Twitter, and Instagram. HPRC's social media pages posted original content, and the hashtag was shared with several partners to encourage them to participate digitally. Weekly posts followed specific themes ("Know your part," "Keep it real," "Enjoy quality time together," "Listen, show empathy, and validate others," and "When there's conflict, address and repair it").

### National Nutrition Month

The March 2022 social media campaign focused on 3–4 posts each week, highlighting different themes and using the hashtags #National Nutrition Month, #FitnessFriday, and #RealFoodFirst. This campaign used a social media schedule and posted videos, photos, infographics, recipes, and articles from HPRC, OPSS, and G4G. Each post contained one of the designated hashtags on various social media platforms, including Facebook, Twitter, and Instagram. HPRC's social media pages posted original content, and the hashtag was shared with multiple partners to encourage participation. Weekly posts followed specific themes.

- ▶ Week 1: Eat a variety of nutritious foods.
- ▶ Week 2: See a registered dietitian or nutritionist.
- ▶ Week 3: Plan your meals and snacks.
- ▶ Week 4: Create tasty foods at home.
- ▶ Week 5: Put it all together.

## HPRC Blog

The HPRC team published about 45 blog posts in 2022 on its blogger site, reaching more than 7,000 readers. The team leveraged relationships and connections they have with military-affiliated folks to produce blogs on a wide range of performance topics.

- ▶ “3 ways leaders can better manage stress,” written by a former Team USA and intercollegiate athletics head coach
- ▶ “Stress in youth sports: Advice from a 34-year Army Veteran”
- ▶ “A Lieutenant Colonel’s perspective on team-building”
- ▶ “How to channel anxiety to help you optimize performance: Lessons from a discus thrower”
- ▶ “We’re not going to survive—we’re going to thrive!: A military spouse talks about her children’s resilience during deployment”

- ▶ “Total Force Fitness and Human Performance Optimization: A perspective from USU School of Medicine’s Dean Elster”

HPRC team members also contributed their personal stories to the blog.

- ▶ “What I learned from my social media break,” by Camila Almeida
- ▶ “What is physical fitness,” by Tim Gribbin
- ▶ “My journey to plant-based eating,” by Lauren Messina

- ▶ “Navigating the nutrition bar maze,” by Maria McConville

HPRC interns also contributed their stories in 2022.

- ▶ “A college athlete’s experience with iron deficiency,” by Jenny Gerson
- ▶ “Food is a window to cultural diversity,” by Siobhra O’Flaherty
- ▶ “Leading through tragedy: How to manage stress and build resilience,” by Nathan Smith
- ▶ “Why I want to serve: How pursuing one’s values can boost military wellness,” by Nathan Smith

## Print Material Requests & Dissemination Efforts

In an effort to streamline the ordering and dissemination of material requests, the HPRC team worked to develop an online catalog of its available print materials. Completion is expected in 2023, and the team anticipates the catalog will improve access to HPRC’s print materials for our partners.

**Foundational Movements**  
Video demonstrations can be found at [hprc-online.org](http://hprc-online.org)

**Squats**

- Air Squats**
  - Stand with your feet slightly wider than hip shoulder width.
  - Feet may be front or slightly rearward.
  - Keep your weight on mid-foot.
  - Keep your chest up.
  - Go all the way down to the center.
- Back Squats**
  - Position the bar on the air disc.
  - Feet should be flat on the ground, not on your heels.
  - Keep your back straight and chest ahead.

**Lunge**

- Step forward with your right foot.
- Step forward, landing front knee to 90 degrees.
- Push your back knee back on the ground.

**Deadlift**

- Stand with your feet hip-width apart.
- Place your hands just outside your knees (feet facing down).
- Keep your feet slightly back, back straight, and core engaged.
- Keep the object or bar close to you.

**Carry**

- Farmer’s Carry**
  - Deadlift weight up to your side.
  - Engage your core.
  - Keep the weight close to your body.
  - Keep your shoulders back and chest up.
- Fireman’s Carry**
  - Engage your core.
  - Keep your feet back and chest up.

**Push**

- Push-up**
  - Place your hands slightly wider than or under your shoulders.
  - Engage your core.
  - Don’t let your hips rest or sag.
- Overhead Press**
  - Stand with feet hip-width apart.
  - Engage your core, keep your feet facing forward or slightly outward.
  - Keep your head or chin back, and keep your shoulders to your ears.
  - Once the bar clears your head, stop your head forward.

**Pull**

- Chest**
  - Disable the weight up.
  - Keep the bar positioned just above your knees.
  - Push the bar back against your thighs (up toward your chest).
  - Keep your shoulders back and down and your knuckles facing downward.
- Trap Bar Pull**
  - Stand with feet hip-width apart.
  - Push the bar up with your arms.
  - Push the bar up to shoulder level.
  - Keep your elbows high, and knuckles above shoulder to forehead position.

USU CHAMP HUMAN PERFORMANCE RESOURCES BY CHAMP | [hprc-online.org](http://hprc-online.org)

**MIND-BODY ADAPTATIONS TO EXERCISE**

RESISTANCE TRAINING  
AEROBIC TRAINING

- Protective effects and reduced symptoms of depression and anxiety
- Increased respiratory system function
- Increased VO<sub>2</sub> max
- Increased cardiac output, lower resting heart rate
- Increased mind-body resilience to physical, mental, and emotional stress
- Increased muscle mass, strength, endurance and anaerobic power
- Increased blood volume
- Greater bone strength & density

USU CHAMP HUMAN PERFORMANCE RESOURCES BY CHAMP | [hprc-online.org](http://hprc-online.org)

**6 TIPS FOR YOUR WELLNESS MISSION**

It can be hard to make good choices, especially in tricky social situations. Whether you’re eating healthy, quitting smoking, or drinking less, load up your mental rucksack with these tips to help stick to your goals.

**RECOGNIZE**  
Ask yourself: Who? Where? What? When? How? Before you go out, evaluate possible stumbling blocks and make a plan to battle those risks.

**REHEARSE**  
Practice saying “no.” Practice might not make perfect, but it can make things easier.

**REPEAT**  
Sometimes people might ask again or insist. Keep saying “no,” and use direct eye contact to be more assertive.

**REINFORCE**  
Recruit a battle buddy to support your mission. Ask her or him to help you interfere if others get pushy. Or consider leaving an event together if your urges to give in are getting too strong.

**REPLACE**  
Replace less healthy actions with healthy ones. Try going to a movie instead of a bar or inviting friends over for a healthy meal instead of eating out. Or swap beer or soda for water.

**RETREAT**  
Even with the best intentions, there are times when it will be hard to say “no.” Give yourself permission to retreat when necessary, so you can prepare and attack your goal even better next time.

USU CHAMP HUMAN PERFORMANCE RESOURCES BY CHAMP | [hprc-online.org](http://hprc-online.org)

Throughout 2022, the HPRC team fielded multiple requests for print materials. Some notable requests included:

- ▶ HPRC sleep materials for an Army Leadership course at the Army JAG office
- ▶ A large print order of materials across all domains to 1/1 ABCT H2F South Korea
- ▶ Several posters for PEC in Little Rock, Arkansas, including “6 Tips for your wellness mission,” “Mind-body adaptations to exercise,” “Handy guide to portion sizes,” “Power plate,” “Foundational movement,” and “Roadmap to readiness”
- ▶ Shared materials for the USU School of Medicine incoming-student orientation
- ▶ Distribution materials for a Wellness Fair at Joint Base San Antonio-Ft. Sam Houston, Texas

### TFF Resources & Educational Materials

The HPRC team worked on developing, revising, and furnishing HPO and TFF evidence-based materials and resources for multiple military, federal, and civilian partners.

- ▶ Reviewed H2F poster content for the U.S. Army Center for Initial Military Training to provide basic information about sleep readiness, mental readiness, nutritional readiness, spiritual readiness, and physical readiness.
- ▶ HPRC team member Tim Gribbin reviewed and contributed to a “Joint Trauma System High Altitude” clinical practice guideline by updating an altitude graphic and writing an altitude decision algorithm for medics.
- ▶ Collaborated with the USU TriService Nursing Research Program to provide 75 copies of the “TFF self-check” tool for use with conference attendees representing nursing professionals across the Services.
- ▶ Worked with the National Capital Region Market to promote the Deployment Readiness Education for Servicewomen (DRES) app. HPRC authored a blog post about DRES and promoted the app on social media platforms.
- ▶ Collaborated with the U.S. Military-Baylor Graduate Program in Nutrition and the U.S. Army Medical Center of Excellence to provide materials on sleep, mindfulness, and physical activity for inclusion in the Women’s Initiative Team toolkit.
- ▶ Collaborated with U.S. Coast Guard (USCG) Health Promotions to lead a series of discussion sessions with members of the Coast Guard about weight management. The results of the focus group conversations—including obstacles, confidence, and available USCG resources for reaching goal weight—were summarized in a 16-page report for USCG Health Promotions leadership.
- ▶ Partnered with the Army H2F team at Ft. Bliss, Texas, to map out the inclusion of HPRC resources in their H2F Facilitator Course.
- ▶ CHAMP Leadership team members Lauren Messina and Gloria Park sat on a work group led by the U.S. Department of Health and Human Services to establish the Federal Plan for Equitable Long-Term Recovery and Resilience. Monthly work group sessions explored establishing an across-government definition of resilience, and the plan lays out an actionable, whole-of-government approach and framework to equitably strengthen the resilience and well-being of the nation. CHAMP is currently the only DoD group involved in this work group.
- ▶ Revised HPRC’s “Staying Resilient in Times of Crisis” to share with the National Association of Ukraine Psychologists in collaboration with American Psychological Association Division 19.



### DoD Newsletter Contributions

The HPRC team worked with partner organizations to showcase HPRC content in their newsletters. The April Army Resilience Directorate’s (ARD) Army Resilience Community Link newsletter showcased an HPRC article titled, “Optimize your performance to prevent burnout.” This article was subsequently picked up by and published on Army.mil. The April ARD newsletter also featured an HPRC article titled, “An ounce of prevention is worth a pound of cure,” which also included HPRC’s “Power Plate” image. In addition, the October ARD newsletter published an HPRC article titled, “What is physical fitness? Understanding its multiple meanings.”

The HPRC team also provided submissions to the Joint Staff Surgeon Office’s Joint Staff Life newsletter in 2022. A few topics in their newsletter included HPRC’s resources on injury prevention, heat illness, sun safety, and gratitude.

HPRC articles were also included in the Marine and Family Programs Prevention in Action newsletter.

HPRC articles were posted on the MyCG news hub app for U.S. Coast Guard members and their families, including “Mastering your mindset could improve your performance, your life” and “Total force wellness column: Practice kindness, gratitude, and connectedness every day in 2022.”

### Ask the Expert (ATE)

The HPRC team fielded 60 ATE questions in 2022 across all domains, including TFF and Rx3 questions. Some notable questions were:

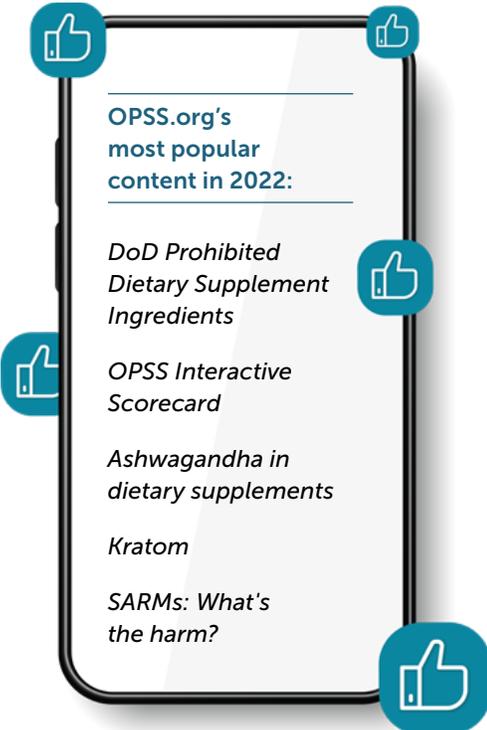
-  *Do you have a good running program for the 3 mile PFT that Marines are required to run every day? How about a return to running or run/walk program?”*
-  *What would be the best nutritional plan for myself if I am focusing on losing weight and building a solid core?”*
-  *Could you provide a PDF detailing specific activities for a unit to conduct to improve organizational cohesion?”*
-  *I’m looking to start a training cycle for the Sailors on my command on Total Force Fitness and looking for a good place to start.”*
-  *I have a Soldier requesting information on how to improve speed and agility. He is in very good shape and was training for best ranger.”*
-  *Are you able to provide the list of ingredients for the food in MREs?”*

[ EDUCATION & TRAINING ]

## Dietary Supplements & Operation Supplement Safety (OPSS)

### Presentations & Virtual Events

The OPSS team continued to maintain an aggressive schedule of dietary supplement trainings, and completed 59 presentations and live events in 2022. We continued to reintegrate in-person presentations with trips to Little Rock, USCG Station Burlington, Ft. Devens, USCG Base Boston, Joint Base Cape Cod, American Public Health Association Annual Meeting and Expo, and Natick Soldier System Center. Other highlights include virtual presentations for the National Academies of Sciences, Engineering, and Medicine Food Forum, National Nutrient Databank Conference, Office of Dietary Supplements Research Practicum, NATO Research Task Group on Dietary Supplements, and H2F Nutrition Domain Deep Dive. CHAMP’s Acting Executive Director, Patricia Deuster, and Director of OPSS, Andrea Lindsey, also participated in a panel discussion for the Federal Working Group on Dietary Supplements. Andrea Lindsey also presented at the Grand Rounds meeting for Home Base, a program dedicated to clinical care, education, and research to support Service Members, Veterans, and their families.



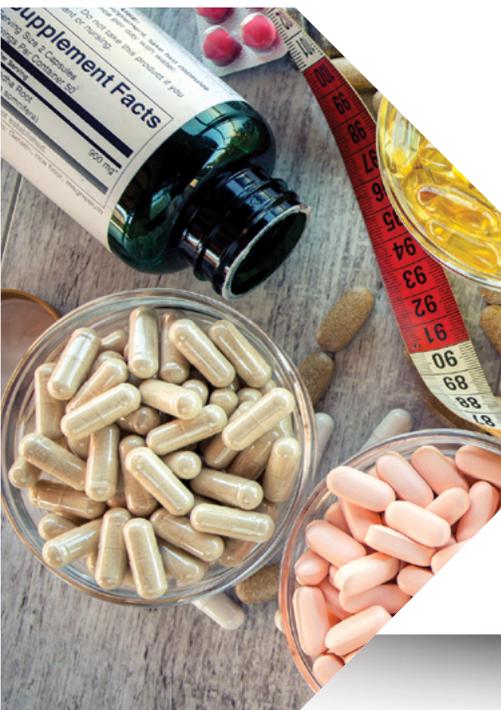
### “Let’s Talk Dietary Supplements” Campaign



This social media campaign focused on increasing awareness of dietary supplements and supplement safety. The campaign ran throughout October and included seven partner videos, many social media posts, and mentions by the U.S. Anti-Doping Agency (USADA) and Office of Dietary Supplements.

### DoDI 6130.06

Department of Defense Instruction 6130.06, “Use of Dietary Supplements in the DoD” was signed on 9 March 2022, formalizing OPSS as the DoD go-to program for dietary supplements. The DoDI also requires dietary supplement education for Service Members and “those who provide



health-related services (e.g., health promotion specialists, fitness leaders, athletic trainers, strength and conditioning specialists...as well as Healthcare personnel)" (Health Professional Training Module; see below). It also mandates adverse event reporting associated with the use of dietary supplements by healthcare providers in the Electronic Health Record, and establishes the OPSS website as host for the *DoD Prohibited Dietary Supplement Ingredients List*.

### Prohibited List

The OPSS team maintains the *DoD Prohibited Dietary Supplement Ingredients List*, which contains more than 4,500 terms (800 primary substances plus more than 3,700 "synonyms"). The OPSS team continues to update the list in accordance with DoDI 6130.06, which states it "will be updated quarterly and as new scientific evidence emerges," and as otherwise needed.

### OPSSup App

The OPSSup app's primary purpose is to enable a user (Service Member) to quickly find information about dietary supplement ingredients and some products, and if they've been identified for potential risk. The plan for the app is a multi-step format where the user would scan the label of a dietary supplement product (e.g., protein powder and workout formula) and see if any ingredients are on the *DoD Prohibited Ingredients List*, have U.S. Food and Drug Administration (FDA) warnings, have been flagged by FDA, or are considered high risk. If the scanner does not return specific information about the product, the user will

have other tools and resources in the app, such as other references, to help them understand more about the product they are reviewing. The app will also include access to other content such as OPSS.org's ATE feature, A-Z list, third-party certification information, and an ingredient search.

### Health Professional Training Module

The OPSS team has built three of five sections and 160 screens in the current "draft" version of the module. The team has also begun to re-review the first sections of the module to ensure compliance with DoDI 6130.06 and the up-to-date *DoD Prohibited Ingredients List*. Completion is targeted for 2024.

### Ask the Expert (ATE)

The OPSS team fielded more than 1,500 inquiries from the ATE portal, more than doubling the number of questions from 2021. The team saw a 166% increase in volume of ATEs since the signing of DoDI 6130.06 in March. Despite the increase in volume, the team has continued to receive positive feedback.

-  *This is very informative and I appreciate your Team getting back to me. I'll be sure to share this with my Soldiers!*
-  *That's a boatload of good information. Thank you for the analysis and the education on where I can find out more about supplements and nutrition."*
-  *Thank you so much for your dedicated response! I very much appreciate being informed not only for me, but also for my soldiers. We appreciate your hard work!"*
-  *This is perfect! Thank you for the honest and straight forward feedback!! I'll definitely recommend that other members check out your resources."*
-  *Thank you, I just wasted my money unfortunately— glad I didn't take it. This is a great service!"*
-  *Thank you so much. Very informative, wanted to understand policy for my troops!"*



## [ LEADERSHIP ]

## CHAMP Clinical Consultations

## Multidisciplinary Case Review Committee (MDCRC)

In 2022, MDCRC provided multidisciplinary clinical consultation for 46 Service Members with a diagnosis of high-risk exertional rhabdomyolysis, exertion-associated hyponatremia, exertional heat stroke, exercise collapse associated with sickle cell trait (ECAST), and exertional sudden cardiac arrest. MDCRC expanded its clinical consultation capabilities by adding standing members from nephrology, hematology-oncology, and pulmonary to the existing specialties of sports medicine, neurology, cardiology, physiology, genetics, physical medicine and rehabilitation, and nutrition. For each consultation, MDCRC invites referring providers to participate in the clinical discussion. The ability of clinicians to consult with the committee continues to provide just-in-time evaluation and treatment

recommendations and assists in coordinating referrals to keep patients within the military treatment network—which results in faster access to providers. The other benefits of MDCRC keeping patients within the military treatment facility network are to (1) facilitate faster return-to-duty decisions, (2) ensure clinicians with expertise in evaluating military-specific health issues evaluate Service Members, (3) maintain provider clinical skills, (4) educate clinicians on exertional heat injury differential diagnosis, and (5) contribute to controlling military health costs. In addition, MDCRC members participated in the execution of a white paper focusing on improving and standardizing access to emergency care personnel and equipment for military training exercises.

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

WHEC continues to contribute to Service Member health and well-being with clinical and educational consults through HPRC-online.org's ATE feature. The WHEC team received heat illness- and exertional injury-related inquiries, and our leading expert, Dr. Francis O'Connor, answered a total of 21 clinical and nine educational consults in 2022. WHEC also updated and shared exertion-related events practice recommendations on the HPRC-hosted WHEC page. 2022 marked the 20<sup>th</sup> year CHAMP contributed "Collapsed Runner" guidelines for the Marine Corps Marathon. The guidelines include Medical Triage and Algorithms for exertional collapse due to hyponatremia, sickle cell trait, and rhabdomyolysis. DHA also approved the following CHAMP/WHEC practice parameters:

- ▶ Initial Management of Exertional Rhabdomyolysis Practice Recommendation
- ▶ Management of the Warfighter with Recurrent or High-Risk Exertional Rhabdomyolysis Practice Recommendation
- ▶ Inpatient Management of Exertional Rhabdomyolysis Practice Recommendation
- ▶ Exercise Associated Hyponatremia Practice Recommendation

## Heat Tolerance Test (HTT)

CHAMP performed four HTTs on Soldiers and trained 192 USU medical students on a simulated heat stroke. In addition, we shared information on CHAMP's Human Performance Lab, HTT protocol, exertion-related injuries, and WHEC resources.



[ LEADERSHIP ]

## WHEC on HPRC

WHEC is dedicated to clinical care, education, research, and policy development to mitigate exertional illness and optimize readiness. In February, WHEC hosted the 6<sup>th</sup> annual Heat Forum at Ft. Benning’s Army Heat Center with in-person and virtual presentations from heat illness experts, researchers, and clinicians on topics covering heat illness prevention, field care, transport, and return to duty.

In 2022, the WHEC web page hosted on the HPRC website had a total of 34,263 page views and 5,245 new users (69% increase). New WHEC content included an exertional heat illness review for medical

students at USU, a mission brief, and an infographic on arm-immersion cooling. Other popular WHEC content included the “Sickle cell trait awareness” video and our “Initial Management of Exertional Rhabdomyolysis Practice Recommendation.”

In addition, WHEC ran a social media “Heat” campaign in June to raise awareness of heat illness that had a total of 4,829 web page views. Our infographic on preventing heat stroke had the highest engagement, with 825 post engagements and 10,210 viewers across all HPRC social media platforms.

## Dietary Supplements & Operation Supplement Safety (OPSS)

### Advisory Board

The OPSS advisory board met twice in 2022 and voted to add hordenine, betel nut, and blue lotus to the *DoD Prohibited Dietary Supplement Ingredients List*.

### Federal Working Group on Adverse Events

Several meetings took place with representatives from FDA, Chair of the DoD Dietary Supplements and Other Self-Care Products Subcommittee, and staff from Force Readiness and Health Assurance Policy Office of the Deputy Assistant Secretary of Defense (ODASD) for Health Readiness Policy & Oversight Office of the Assistant Secretary of Defense (OASD) Health Affairs. OPSS is leading the effort for an Adverse Event Chartered Working Group.

### OPSS Working Group

OPSS hosts a monthly meeting with healthcare providers, other allied health professionals, and leaders from each Service, DHA, Drug Demand Reduction, the Office of Dietary Supplements at NIH, the Pentagon, and USADA to discuss dietary supplement-related topics and provide updates on OPSS, as well as Service-specific work in this space.



## [ OPERATIONAL SUPPORT ]

### HPO & TFF Future Operations

#### Optimizing Career Field Mission Capabilities and Identifying Line-Valued Metrics

In collaboration with members of the USAF 2W1 Aircraft Armament System Technicians career field assigned to the 388<sup>th</sup> Maintenance Group (388 MXG) at Hill Air Force Base and the 366<sup>th</sup> Maintenance Group (366 MXG) at Mountain Home Air Force Base, the HPO Future Operations Team built Capability-Based Blueprints (CBBs) for each respective unit/career-field community. These CBBs operationalize HPO and TFF through a mixed methods process that identifies career-field 2W1 critical core tasks, occupational exposures, health and performance priorities, and 2W1 line-valued metrics (e.g., task performance metrics and career-field health trends). The results of the CBBs will be used to improve the targeting and operational validation of performance and health outcomes, and to support agency services at Hill and Mountain Home Air Force bases.



### Consultative Services and In-depth Resource Requests

#### Dietary Supplements & OPSS

The OPSS team fielded 27 consultative service requests and one in-depth resource request from healthcare providers, legal personnel, military leaders, and others providing information on dietary supplement products, ingredients, education, and policies.



[ INTERNAL CHAMP ACTIVITIES ]

## CHAMP Intranet & Newsletter

CHAMP uses digital tools to keep staff engaged. The CHAMP intranet houses resources and information across CHAMP’s pillars to ensure staff have access to pertinent information in order to onboard smoothly, promote the Center, and carry out our mission. CHAMP delivers a monthly newsletter to its 80 members to inform CHAMP staff of significant activities, announcements, and acknowledgements. It’s also used to facilitate organizational learning, boost collaboration and information sharing among our pillars, and increase institutional knowledge.

## CHAMP Retreat

The 2022 CHAMP retreat provided an opportunity for each team at CHAMP to learn more about how each team member works at their best and what each individual and the team as a whole can do to support one another. This was accomplished through 13 team retreat sessions, where each team member had the opportunity to share a high-point story that captured how they work at their best and how they prefer to be supported. Team members were then able to share the strengths they see in each other and identify ways to better support the team in the future.

Each team then explored common themes in each person’s story to identify the team’s positive core strengths, behaviors, and conditions that enable the team as a whole to thrive. Teammates also developed an action plan to further cultivate the team’s positive core in the future.

## HPRC Listening Sessions

To further the HPRC team’s knowledge of and connection with Service Member experiences, the team hosted two listening sessions with USU Brigade members of the Air Force and Navy. The sessions gave team members an opportunity to ask Service Members about where they go for health and performance information, their feelings on whether leadership values Service Member performance optimization, how they prefer to receive health information, and which health topics are currently most salient to Service Members.

## CHAMP Internship Program

The mission of the CHAMP internship program is to train young talents and future DoD, medical, academia, and industry leaders on holistic skill sets related to HPO and TFF. The program supports several CHAMP strategic objectives, which directly align with the USU strategy plan. A structured internship program increases CHAMP visibility, promotes community engagement, and fosters new partnerships and collaborations.

The program is available to students at various academic levels and active-duty Service Members in career transition.

This year, CHAMP staff mentored a total of 11 interns supporting various projects across CHAMP directorates and TFF domains. Collectively, the interns contributed to the CHAMP mission in the following ways:

- › Reviewed article manuscripts
- › Outlined, drafted, created, and edited educational materials
- › Analyzed research data
- › Generated data to inform future research projects
- › Analyzed feedback data from HPO presentations
- › Provided feedback on HPRC and G4G products



- 】 Promoted social media campaigns to reach specific audiences
- 】 Established new relationships with external partners and collaborations

At the end of the program, interns delivered a presentation and demonstrated the acquisition of transferable skill sets related to HPO and TFF. Overall, the interns expressed a high level of satisfaction with their CHAMP internships.

## CHAMP Diversity, Equity & Inclusion (DEI) Work Group

CHAMP's DEI Work Group was formally established in 2020 to provide safe spaces and opportunities for all staff to access, learn about, and apply DEI resources (including those from USU and HJF) into CHAMP's research, education, leadership, and operational support efforts. Over the past year, the DEI work group collaborated with CHAMP leadership to develop and implement a series of DEI-related questions for CHAMP's annual 360 assessment, held a panel discussion with CHAMP staff on the unique needs, experiences, and perspectives of military spouses, and hosted a presentation on microaggressions. In addition, a DEI page on CHAMP's intranet was created to promote upcoming DEI-related events and activities and provide links to prior presentations, resources, and articles of interest. The DEI page also features an anonymous comment box for staff to ask questions, offer suggestions, and share resources. The DEI work group continues to increase accessibility to current DEI resources through a monthly email digest, the CHAMP newsletter, and offerings at CHAMP staff meetings.



# 2022 Publications, Posters & Presentations

## Peer-Reviewed Publications

Bouchama, A., Abuyassin, B., Lehe, C., Laitano, O., Jay, O., O'Connor, F. G., & Leon, L. R. (2022). Classic and exertional heatstroke. *Nature Reviews Disease Primers*, 8(1), 8. doi:10.1038/s41572-021-00334-6

Bozzay, J. D., Nelson, D. A., Clifton, D. R., Edgeworth, D. B., Deuster, P. A., Ritchie, J. D., Brown, S. R., & Kaplan, A. J. (2022). Comparing functional outcomes in minimally invasive versus open inguinal hernia repair using the army physical fitness test. *Hernia*. doi:10.1007/s10029-022-02650-6

Cameron, K. L., Peck, K. Y., Davi, S. M., Owens, C., Svoboda, C., DiStefano, L. J., Marshall, S. W., de la Motte, S. J., Beutler, C., & Padua, D. A. (2022). Association between Landing Error Scoring System (LESS) items and the incidence rate of lower extremity stress fracture. *Orthopaedic Journal of Sports Medicine*, 10(6), 23259671221100790. doi:10.1177/23259671221100790

Chamberlin, R. A., McCarthy, R., Lunasco, T. K., Park, G. H., & Deuster, P. A. (2022). Critical competencies of military embedded health and performance professionals: The "Culture General" approach. *Journal of Special Operations Medicine*, 22(3), 118–123. doi:10.55460/Y5O4-7WUZ

Chen, Y., Yu, T., & Deuster, P. A. (2022). Acute heat stress-induced apoptosis in mouse skeletal muscle is not associated with alteration of glutamine homeostasis. *PLoS One*, 17(11), e0278176. doi:10.1371/journal.pone.0278176

Crawford, C., Avula, B., Lindsey, A. T., Walter, A., Katragunta, K., Khan, I. A., & Deuster, P. A. (2022). Analysis of select dietary supplement products marketed to support or boost the immune system. *JAMA Network Open*, 5(8), e2226040. doi:10.1001/jamanetworkopen.2022.26040

Crawford, C., Brown, L. L., Costello, R. B., & Deuster, P. A. (2022). Select dietary supplement ingredients for preserving and protecting the immune system in healthy individuals: A systematic review. *Nutrients*, 14(21), 4604. https://www.mdpi.com/2072-6643/14/21/4604

Crawford, C., Walter, A. R., Avula, B., Lindsey, A. T., Hunter, A. M., Ikhlas, A. K., & Deuster, P. A. (2022). Relative safety and quality of various dietary supplement products U.S. Service Members ask about. *Clinical Toxicology*, 1–8. doi:10.1080/15563650.2022.2036751

Currie, T. L., Engler, M. M., Olsen, C. H., Krauthamer, V., Scott, J. M., Deuster, P. A., & Flagg, T. P. (2022). The effects of berry extracts on oxidative stress in cultured cardiomyocytes and microglial cells: A potential cardioprotective and neuroprotective mechanism. *Molecules*, 27(9), 2789. doi:10.3390/molecules27092789

DeGroot, D., Henderson, K., & O'Connor, F. (2022). Exertional heat illness at Fort Benning, GA: Unique insights from the Army Heat Center. *Medical Surveillance Monthly Report*, 29(4), 2–7. https://www.ncbi.nlm.nih.gov/pubmed/35608507

DeGroot, D. W., O'Connor, F. G., & Roberts, W. O. (2022). Exertional heat stroke: An evidence based approach to clinical assessment and management. *Experimental Physiology*. doi:10.1113/EP090488

Durazzo A, Sorkin BC, Lucarini M, Gusev PA, Kuszak AJ, Crawford C, Boyd C, Deuster PA, Saldanha LG, Gurley BJ, Pehrsson PR, Harnly JM, Turrini A, Andrews KW, Lindsey AT, Heinrich M, Dwyer JT. Analytical challenges and metrological approaches to ensuring dietary supplement quality: International perspectives. *Frontiers in Pharmacology*. 2022; 12: 3956; doi:10.3389/fphar.2021.714434

Johnston, J. J., Dirksen, R. T., Girard, T., Hopkins, P. M., Kraeva, N., **Ognoo, M.**, Radenbaugh, K. B., Riazi, S., Robinson, R. L., Saddic Ili, L. A., **Sambuughin, N.**, Saxena, R., Shepherd, S., Stowell, K., Weber, J., Yoo, S., Rosenberg, H., & Biesecker, L. G. (2022). Updated variant curation expert panel criteria and pathogenicity classifications for 251 variants for RYR1-related malignant hyperthermia susceptibility. *Human Molecular Genetics*. doi:10.1093/hmg/ddac145

**Kazman, J. B., Bonner, J. A., Kegel, J. L., Nelson, D. A., & Deuster, P. A.** (2022). Leading indicators of readiness among the general Army and special operations forces: Predictive and psychometric analysis of the global assessment tool. *Military Psychology*, 1–13. doi:10.1080/08995605.2022.2139121

**Kirkpatrick, K. M., Kleinberger, C. A., Moylan, E. M., Bukhari, A. S., & Deuster, P. A.** (2022). Nutrition program fidelity assessment tool – a framework for optimizing implementation in military dining facilities. *Public Health Nutrition*, 1–24. doi:10.1017/s1368980022001896

**Kleinberger, C. A., Bukhari, A. S., Kirkpatrick, K. M., Moylan, E. M., Billington, J. L., Armstrong, N. J., Cole, R. E., & Deuster, P. A.** (2022). Go for Green® nutrition program: Translating evidence into practice. *Military Medicine*. doi:10.1093/milmed/usab503

**Lindsey, A., Crawford, C., & Deuster, P. A.** (2022). Concerns about dietary supplements. *Agro FOOD Industry Hi-Tech*, 33(2), 17–8.

Nelson, D. A., Huh, J., **Clifton, D. R., Edgeworth, D. B., Shell, D., Choi, Y. S., & Deuster, P. A.** (2022). Rates of lapidus procedures in the US Military before and after the advent of and advocacy for tri-plane lapidus corrective surgery. *Journal of Foot & Ankle Surgery*. doi:10.1053/j.jfas.2022.08.010

Nye, N. S., Grubic, T., Kim, M., **O'Connor, F. G., & Deuster, P. A.** (2022). Universal training precautions: A review of evidence and recommendations for prevention of exercise-related injury, illness, and death. *Journal of Athletic Training*. doi:10.4085/1062-6050-0400.21

**Park, G. H., Knust, S. K., Haselhuhn, S., Whalen, S. J., Deuster, P. A., Greene, C. H., 3rd, Dretsch, M. N., Bonvie, J. L., Lippy, R. D., Lunasco, T. K., & Myatt, C. A.** (2022). Advancing the practice of contemporary military performance psychology: A full-spectrum approach to psychological health and readiness. *Journal of Special Operations Medicine*, 22(1), 115–120. doi:10.55460/18db-itve

**Rittenhouse, M., & Deuster, P. A.** (2022). Omega-3 fatty acids: Benefits for performance and recovery. *Journal of Special Operations Medicine*, 22(4), 97–101. doi:10.55460/6i33-5ipr

**Rittenhouse, M., Sambuughin, N., & Deuster, P.** (2022). Optimization of omega-3 index levels in athletes at the US Naval Academy: Personalized omega-3 fatty acid dosage and molecular genetic approaches. *Nutrients*, 14(14), 2966. <https://www.mdpi.com/2072-6643/14/14/2966>

van der Wee, M. J. L., Vogels, S., Bakker, E. W. P., **O'Connor, F. G., Hoencamp, R., & Zimmermann, W. O.** (2022). Association between intracompartmental pressures in the deep posterior compartment of the leg and conservative treatment outcome for exercise-related leg pain in Military Service Members. *Archives of Rehabilitation Research and Clinical Translation*, 4(4), 100232. doi:10.1016/j.arcrct.2022.100232

Webber, B. J., Bornstein, D. B., **Deuster, P. A., O'Connor, F. G., Park, S., Rose, K. M., & Whitfield, G. P.** (2022). BMI and physical activity, military-aged U.S. population 2015–2020. *American Journal of Preventive Medicine*. doi:10.1016/j.amepre.2022.08.008

**Yu, T., Dohl, J., Park, Y. M., Brown, L. L., Costello, R. B., Chen, Y., & Deuster, P. A.** (2022). Protective effects of dietary curcumin and astaxanthin against heat-induced ROS production and skeletal muscle injury in male and female C57BL/6J mice. *Life Sciences*, 288, 120160. doi:10.1016/j.lfs.2021.120160

**Yu, T., Park, Y. M., Wang, L., & Deuster, P. A.** (2022). L-citrulline prevents heat-induced mitochondrial dysfunction and cell injury through nitric oxide-mediated Drp1 inhibition in mouse C2C12 myoblasts. *British Journal of Nutrition*, 1–24. doi:10.1017/s0007114522001982

## Research Poster & Abstract Presentations (in chronological order)

Walton NI, Chuang K, Ren MQ, Abraham PA, Harp J, Edgeworth D, Sambuughin N, O'Connor FG, Deuster PA. *Genomics of exertion-related events associated with sickle cell trait study: The role of strenuous exercise as risk factor for developing exertion-related events*. Poster presentation at: Association of Military Surgeons of the United States (AMSUS) annual meeting; 2022 Feb. 2–11, National Harbor, MD; virtual.

Givens ML, Walter AR, Crawford C, Avula B, Lindsey AT, Hunter AM, Khan IA, Deuster PA. *Mitigating dietary supplement risk through community targeted education and product testing*. Oral presentation at: American College of Medical Toxicology (ACMT) annual scientific meeting; 2022 March 13; virtual.

Chamberlin RA, McCarthy RG. *"Adjusting fire": Adapting multidisciplinary research with military communities to virtual space*. Poster presentation at: Society for Applied Anthropology Annual meeting; 2022 March 22–26; virtual.

Currie TL, Engler MM, Olsen CH, Krauthamer V, Scott JM, Deuster PA, Flagg TP. *The effects of blackcurrant and berry extracts on oxidative stress in cultured cardiomyocytes and microglial cells*. Poster presentation at: Experimental Biology annual meeting; 2022 April 2–5; Philadelphia, PA.

Kester RM, Stranieri AM, Kazman JB, Hazel C, Abraham PA, Harp J, Deuster PA, Jeffrey C, Leggit JC, O'Connor FG. *Heat tolerance testing: A 2-year follow-up study after exertional heat illness*. Oral presentation at: American Medical Society for Sports Medicine (AMSSM) Annual Meeting; 2022 April 8; Austin, TX; virtual.

Currie TL, Engler MM, Olsen CH, Krauthamer V, Scott JM, Deuster PA, Flagg TP. *The effects of blackcurrant and berry extracts on oxidative stress in cultured cardiomyocytes and microglial cells*. Poster presentation at: Experimental Biology conference; 2022 April 14; Philadelphia, PA.

Currie T, Engler M, Olsen C, Krauthamer V, Scott J, Deuster P, Flagg T. (2022). *Berry extracts and their key bioactive ingredients inhibit oxidative stress in cultured microglia cells*. Poster presentation at: USU Tri-Service Nursing Research Program Dissemination Course; 2022 April 19–21; virtual.

Currie T, Engler M, Olsen C, Krauthamer V, Scott J, Deuster P, Flagg T. (2022). *Blackcurrant extract inhibits oxidative stress in cultured cardiomyocyte cells*. Poster presentation at: American Heart Association Vascular Discovery: From Genes to Medicine; 2022 May 11–14; Seattle, WA.

Lindsey AT. *Operation supplement safety ingredient database: An encyclopedic collection of ingredients*. Oral presentation at: National Nutrient Database Conference (NNDC); 2022 May 16; virtual.

Kirkpatrick A, Billington J, Robinson D. *Creation of a ready-to-use-item database to improve nutrition labeling program efficiency*. Poster presentation at: NNDC; 2022 May 16–18; virtual.

Rittenhouse M. *Optimization of Omega-3 Index levels in athletes at the US Naval Academy: Personalized omega-3 fatty acid dosage and molecular genetic approaches*. Oral presentation at: Collegiate and Professional Sports Dietitians Association (CPSDA) annual meeting; 2022 May 18; virtual.

Chuang K, Harp J, Hazel C, Ren MQ, Abraham PA, Sambuughin N, Ognoon M, Michaelson L, O'Connor FG, Deuster PA. *Phenotypic profiling of sickle cell trait individuals experiencing exertion-related events*. Poster presentation at: USU Research Days; 2022 May 17–19; Bethesda, MD.

Exley SL, Schvey NA, Ricker E, Barret A, de la Motte S. *Gender-based stigma and perceived stress among military women in a predominantly male training environment*. Poster presentation at: USU Research Days; 2022 May 17–19; Bethesda, MD.

**Gregory A, Dartt C, Lyons K, de la Motte S.** *The relationship between LESS scores and lower extremity injury in U.S. Service Members during secondary training.* Poster presentation at: USU Research Days; 2022 May 17–19; Bethesda, MD.

**Hazel C, Kazman J, Abraham P, Deuster P, O'Connor F.** *Self-reported functional limitations in Service Members 6 months post exertion-related injury.* Poster presentation at: USU Research Days; 2022 May 17–19; Bethesda, MD.

**Kegel JL, Kazman JB, Clifton D, Nelson DA, Deuster PA.** *The combined effects of coping and pain interference on Army readiness.* Poster presentation at: USU Research Days; 2022 May 17–19; Bethesda, MD.

**Park YM, Deuster PA, Yu T.** *L-citrulline induces mitochondrial elongation through nitric oxide-dependent phosphorylation of the mitochondrial fission protein Drp1 in mouse C2C12 myoblasts.* Poster presentation at: USU Research Days; 2022 May 17–19; Bethesda, MD.

**Patton M, Rittenhouse M, Kegel J, Kazman J, Deuster P.** *Omega-3 Index is associated with overall diet quality based on an automated self-administered 24-hour dietary assessment tool.* Poster presentation at: USU Research Days; 2022 May 17–19; Bethesda, MD.

**Clifton D, Shivers BL, de la Motte SJ.** *Reducing the burden of neck and back pain in Naval Aircrew.* Oral presentation at: Aerospace Medical Association conference; 2022 May 23–26; Reno, NV.

**Gregory A, Dartt C, Lyons K, de la Motte SJ.** *Changes in landing error scoring system scores after secondary training.* Poster presentation at: 2022 American College of Sports Medicine (ACSM) conference; 2022 June 1; San Diego, CA.

**Webber BJ, Omura JD, Bornstein DB, Deuster PA, O'Connor FG, Park S, Whitfield GP.** *Physical activity level of the military age- and BMI-eligible population of the United States, 2015–2020.* Poster presentation at: ACSM conference; 2022 June 1; San Diego, CA.

**Clifton DR, Nelson DA, Choi YS, Edgeworth D, Shell D, Deuster PA.** *Financial impact of embedded injury prevention experts in U.S. Army initial entry training.*

Oral presentation at: National Athletic Trainers Association (NATA); 2022 June 28–July 2; Philadelphia, PA.

**de la Motte SJ, Goforth CW, Ricker EA.** *Pain interference is affected by self-reported resilience in Service Members.* Oral presentation at: NATA; 2022 June 28–July 2; Philadelphia, PA.

**Lyons KD, Tra J, Ricker EA, Scott JM, Goforth CW, de la Motte SJ.** *IGF-I, Vitamin D and C-reactive protein biomarkers related to current musculoskeletal conditions.* Oral presentation at: NATA; 2022 June 28–July 2; Philadelphia, PA.

**Bukhari AS, Champagne CM, Armstrong NJ, McGraw SM, Moylan EM, Kleinberger CA, Kirkpatrick KM, Billington JL, Deuster PA, Cole RE.** *Nutrition interventions in military dining facilities can enhance meal quality while promoting meal satisfaction.* Oral presentation at: Military Health System Research Symposium (MHSRS); 2022 Sept. 12–15; Kissimmee, FL.

**Clifton DR, Nelson DA, Edgeworth D, Choi YS, Shell D, Deuster PA.** *The musculoskeletal outcomes and readiness evaluation (MORE) project: Introduction to a large, multiservice analysis of health care trajectories and endpoints.* Oral presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

**Currie TL, Engler MM, Olsen CH, Krauthamer V, Scott JM, Deuster PA, Flagg TP.** *Berry extracts and their key bioactive ingredients inhibit oxidative stress in cultured microglia cells.* Poster presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

**Dartt CE, Ricker EA, Gregory AB, de la Motte SJ.** *Surveyed reasons for seeking care for musculoskeletal injuries during military training.* Oral presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

**Hinman S, Mintz R, Shivers A, Kirkpatrick K.** *Engaging nutrition program operators via social media to maximize quality implementation.* Poster presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

**Kirkpatrick K, Kleinberger C, Bukhari A, Deuster PA.** *Military dining facility nutrition program fidelity*

*assessment tool supports program optimization for nutritional fitness.* Poster presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

McGraw SM, Bukhari AS, Armstrong NJ, Champagne CM, Kirkpatrick KM, Billington JL, Deuster PA, Cole RE. *Go for Green® program evaluation finds nutrition knowledge gaps among foodservice staff.* Poster presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

Maldonado CJ, Jessica A. White-Phillip JA, Liu Y, Erbele ID, Nelson DA, Edgeworth DB, Y. Sammy Choi YS. *Exposome signatures of tinnitus and hearing loss: Impact on medical readiness stratification.* Poster presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

Mungunsukh O, Sambuughin N, Hazel C, Harp J, Abraham PA, Leggit J, Deuster PA, O'Connor FG. *Genetics of exertional heat illness: Exploratory genomic study.* Poster presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

Nelson DA, Huh J, Clifton DR, Edgeworth D, Shell D, Choi YS, Deuster PA. *Rates of and risk factors for symptomatic hallux valgus among US Military Service Members.* Poster presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

Ren M, Sambuughin N, Chuang K, Abraham P, Harp J, Edgeworth D, Bateman NW, Zhou M, Conrads TP, O'Connor F, Deuster P. *Genomics of exertion-related events associated with sickle cell trait study: Preliminary results of plasma proteome profiling.* Poster presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

Ren M, Sambuughin N, Chuang K, Abraham P, Harp J, Edgeworth D, Hupalo D, Zhang X, Wilkerson M, Dalgard CL, O'Connor F, Deuster P. *Genomics of exertion-related events associated with sickle cell trait (GERESCT) study: Preliminary results from genomic analysis.* Poster presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

Ricker EA, Lyons K, Barrett AS, Goforth C, de la Motte SJ. *Medical care-seeking for musculoskeletal injury by Marine officers in secondary training.* Poster presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

Talebi S, Lary DJ, Wijeratne LOH, Fernando B, Lary T, Lary MD, Sadler J, Sridhar A, Waczak J, Aker A, Zhang Y, Deuster P. *Dense urban environment dosimetry for actionable information and recording exposure (DUE DARE).* Oral presentation at: MHSRS; 2022 Sept. 12–15; Kissimmee, FL.

Park GH, Givens M, Deuster PA, Messina LA. *Total Force Fitness: A global paradigm for military readiness.* Oral presentation at: International Congress of Military Medicine (ICMM) World Congress; 2022 Sept. 7; Brussels, Belgium.

Park GH, Givens M, Deuster PA. *Total Force Fitness: Bridging performance optimization and psychological health approaches for warfighter readiness.* Oral presentation at: ICMM World Congress; 2022 Sept. 7; Brussels, Belgium.

Lindsey AT, Deuster PA, Faurot K, Corbett AH, Asher GN. *Are some dietary supplements a threat to military readiness?* Oral presentation at: American Public Health Association Conference; 2022 Nov 6–9; Boston, MA.

## Presentations at Scientific Conferences

Kester R. *Heat tolerance testing for return to duty: A study of predictive validity.* Oral presentation at: 2022 WHEC Heat Forum; 2022 Feb. 22; Ft. Benning, GA; virtual.

O'Connor FG. *Profiles and return to duty (RTD).* Oral presentation at: 2022 WHEC Heat Forum; 2022 Feb. 22; Ft. Benning, GA; virtual.

O'Connor FG. *Exertional collapse in athletes with sickle cell trait.* Oral presentation at: NFL Physicians Society Annual Combine Scientific Meeting; 2022, March 2; Indianapolis, IN.

Scott J, Lindsey AT. *Dietary supplements and the U.S. Department of Defense.* Oral presentation at: The Office of Dietary Supplements sponsored Mary

Frances Picciano Dietary Supplements Research Practicum; 2022 May 27; Bethesda, MD; virtual.

**Kester R.** *Heat tolerance testing for return to duty: A study of predictive validity.* Oral presentation at: American Medical Society for Sports Medicine (AMS-SM) Annual Meeting; 2022 Apr. 8; Austin, TX; virtual.

**O'Connor FG.** *Prevention of exertional illness.* Special guest oral presentation at: Annual Meeting of Hughston Sports Medicine Society; 2022 April 21–23; Columbus, GA.

**Park GH, Bowles SV, Paoletti G, Pokorney C, Greene III CH, Davos A.** *Psychosocial wellbeing, spirituality, meaning, and performance in the military.*

Panel discussion with: the American Psychological Association (APA) Division 19 (Society for Military Psychology) Summit; 2022 June 24; virtual.

**Kimmons J, Park GH, Wallinger JC.** *Behavioral design in nutrition.* Panel discussion for: the DoD Food and Nutrition Committee Meeting; 2022 Oct. 19; Bethesda, MD.

**Park GH, Bowles SV, Pokorney C, Chamberlin R, Moeser-Whottle E, Yaden D, Zust JL, Alders EAA.** Reframing spiritual fitness: Tools and strategies for inclusive practice. Panel discussion with: APA Division 19 (Society for Military Psychology) Research Symposia; 2022 Nov. 10; virtual.

## Presentations at Other Conferences

**Alders E, McCarthy R.** *24 SOW and spirituality team consultation project update.* Oral presentation at: Annual Training for 24 SOW Chaplain Corps (AFSOC); 2022 Jan. 21; virtual.

**Scott J.** *Concepts of nutritional fitness as a domain of Total Force Fitness and emerging dietary patterns that may support mental health.* Oral presentation at: Joint Special Operations Command Clinical conference; 2022 Jan. 26–27; Ft. Bragg, NC.

**McCarthy R, Alders E, Pokorney C, Kiser S.** *Special tactics perceptions on spiritual fitness for warfare.* Oral presentation with 24 SOW Chaplains at: AFSPCWAR Human Performance Advisory Board meeting; 2022 Feb. 24; virtual.

**Kirkpatrick K.** *Fueling Service Members with Go for Green®.* Oral presentation at: American Logistics Association National Food Expo and Training; 2022 March 17; virtual.

**Lindsey A.** *Exploring effective messaging strategies for changing consumer food behaviors.* Oral presentation at: the Food Forum National Academies of Sciences, Engineering, and Medicine; 2022 March 23; virtual.

**Lindsey A, Vander Molen L.** *Dietary supplements and operation supplement safety.* Oral presentation for online course at: Joint Advanced Nutrition and Dietetics Symposium (JANDS); 2022 March 21–27; virtual.

**Robinson D.** *Military nutrition environment (MNE): A complex system.* Oral presentation at: Air Force Health Promotion Workshop; 2022 April 20; virtual.

**Currie T, Scott JM.** *A silent leadership strategy: Nutrition inspired leadership (Next2NIL).* Oral presentation at: International Leadership Association (ILA) Healthcare Leadership conference; 2022 May 2; virtual.

**Alders E, Pokorney C.** *Perceptions of military chaplains navigating spiritual fitness and the LGBTQ community.* Oral presentation at: Joint 2022 Annual Conference for the Association of Clinical Pastoral Education/Association of Professional Chaplains; 2022 May 10; virtual.

**Scott J, Lindsey A.** *Dietary supplements and the U.S. Department of Defense.* Oral presentation at: The Office of Dietary Supplements sponsored Mary Frances Picciano Dietary Supplements Research Practicum; 2022 May 25; Bethesda, MD and virtual.

**Paoletti G, Park G.** *Role of spirituality in Service Member well-being.* Panel discussion and moderator at: Military Psychology Summit; 2022 June 24; virtual.

**Lindsey A.** *Dietary supplements and Operation Supplement Safety.* Oral presentation at: USMC Summer Leadership conference; 2022 June 28; virtual.

**Gregory A.** *Dietary supplement use in U.S. Marines during secondary training.* Oral presentation at: AMED & DHA Research to Practice Seminar; 2022 Sept. 12; virtual.

**Kirkpatrick K.** *Go for Green® performance nutrition program.* Oral presentation at: Food Service Sector Dialogue; 2022 Oct. 25; Washington, DC.

**Robinson D, Hinman S.** *Military nutrition environment (MNE): A complex system.* Oral presentation at: Air Force Health Promotion Workshop; 2022 Oct. 26; virtual.

**Lindsey A.** *Are some dietary supplements a threat to military readiness?* Oral presentation at: American Public Health Association Conference; 2022 Nov. 8; Boston, MA.

**Deuster P.** *Nutrition fitness: How do we get there?* Keynote speaker presentation at: U.S. Army Center for Initial Military Training (CIMT) Holistic Health and Fitness (H2F) Nutrition Domain Deep Dive: Nutritional Readiness meeting; 2022 Nov. 22; virtual.

**Lindsey AT.** *Dietary supplements and Operation Supplement Safety.* Oral presentation at: U.S. Army CIMT H2F Nutrition Domain Deep Dive: Nutritional Readiness meeting; 2022 Nov. 22; virtual.

**Robinson D.** *Military nutrition environment: A complex system.* Oral presentation at: U.S. Army CIMT H2F Nutrition Domain Deep Dive: Nutritional Readiness meeting; 2022 Nov. 22; virtual.

# Partners & Collaborators

## Internal DoD USU Stakeholders

Center for Deployment Psychology	Defense and Veterans Center for Integrative Pain Management	Drug Demand Reduction Program	Naval Support Activity Bethesda
Center for Neuroscience and Regenerative Medicine	Defense Medical Ethics Center	Traumatic Injury Research Program	Office of Student Affairs
Center for Rehabilitation Sciences Research	Department of Anatomy, Physiology & Genetics	Graduate School of Nursing	Fellowship Program
Center for the Study of Traumatic Stress	Department of Anesthesiology	Henry M. Jackson Foundation for the Advancement of Military Medicine	USU School of Medicine
College of Allied Health Sciences	Department of Military and Emergency Medicine	National Capital Area Sports Medicine	

## External DoD Stakeholders

Air Force Lifestyle & Performance Medicine Working Group	Defense Health Agency	Military OneSource	Too Much To Lose
Air National Guard	Defense Media Activity	Morale, Welfare and Recreation	U.S. Air Force Academy
Armed Forces Health Surveillance Center	Defense Suicide Prevention Office	National Defense University	U.S. Air Force Research Laboratory
Army National Guard	Defense Threat Reduction Agency	Naval Health Research Center	U.S. Army Center for Initial Military Training
Army Research Institute of Environmental Medicine	Fit to Win – Wellness - DiLorenzo Pentagon Health Clinic (DPHC)	Naval War College	U.S. Army Forces Command
Army Resilience Directorate	Grand Forks Air Force Base	Navy and Marine Corps Public Health Center	U.S. Army Holistic Health and Fitness (H2F)
Assistant Secretary of the Air Force for Energy, Installations, and Environment	Hearing Center of Excellence	Navy Medicine Medical Power for Navy Superiority	Defense Centers for Public Health – Aberdeen (DCPH-A; formerly the U.S. Army Public Health Center)
Defense Advanced Research Projects	Joint Centers of Culinary Excellence	Office of Naval Intelligence	U.S. Coast Guard Academy
Defense Centers for Public Health	Keller Army Community Hospital	Psychological Health Center of Excellence	U.S. Military Academy at West Point
Defense Commissary Agency Headquarters	Medical Education and Training Campus	Semper Fit	U.S. Special Operations Command
	Military Community and Family Policy	Services: U.S. Air Force, U.S. Army, U.S. Coast Guard, U.S. Marine Corps, U.S. Navy, U.S. Space Force	U.S. National Guard Bureau

U.S. Naval Academy  
  
National Guard  
Professional Education  
Center

Walter Reed Army  
Institute of Research  
  
Walter Reed National  
Military Medical Center

81<sup>st</sup> Readiness Division,  
Army Reserve  
  
116<sup>th</sup> Military  
Intelligence Brigade

## External Federal Partners

Centers for Disease Control  
and Prevention

Office of Dietary  
Supplements, National  
Institutes of Health

U.S. Department of  
Homeland Security

U.S. Department of Veterans  
Affairs, Dayton Healthcare

Federal Trade Commission

U.S. Department of Justice

U.S. Drug Enforcement  
Administration

National Center for  
Complementary and  
Integrative Health, National  
Institutes of Health

U.S. Department  
of Agriculture

U.S. Department of  
Veterans Affairs

U.S. Food and Drug  
Administration

U.S. Department of Health  
and Human Services

## Collaborators: Academic Institutions

Clemson University

National Defense  
University

University of Arizona,  
Andrew Weil Center for  
Integrative Medicine

University of Tennessee,  
Chattanooga

Duke University

Stanford University

University of  
Connecticut, Korey Stringer  
Institute

University of Toronto

George Mason  
University

The Kinsey Institute

University of  
Mississippi, Oxford

Virginia Commonwealth  
University

Heller Institute of  
Medical Research

The Ohio State  
University

University of Tampa

William & Mary Cohen Career  
Center

Joint Special Operations  
University

Tufts University

## Professional Associations

American College  
of Lifestyle Medicine

American Public  
Health Association

College of Pastoral  
Supervision &  
Psychotherapy

National Athletic  
Trainers' Association

American College  
of Sports Medicine

American Psychological  
Association (Division 19:  
Military Psychology)

Collegiate and  
Professional Sports  
Dietitians Association

National Collegiate  
Athletic Association

American Medical Society for  
Sports Medicine

American Society  
for Nutrition

Council for  
Responsible Nutrition

National Strength  
and Conditioning Association

Academy of Nutrition  
and Dietetics

## Other Partners and Collaborators

Centre for Trauma,  
Asylum & Refugees (UK)

Inova-George Mason  
University Center for  
Clinical Proteomics

OmegaQuant

U.S. Anti-Doping Agency  
(USADA)

Ignite

Military Family  
Learning Network

The Institute for  
Integrative Health

Women's Health  
Integrated Research Center  
at Inova

Therapeutic Research Center

# CHAMP Goals for 2023

## Leadership

- › Establish the Joint Exertion-Related Event Collaborative in conjunction with the Joint Casualty Center.
- › Publish a CHAMP clinical practice guideline on the prevention and management of exertional heat illness.
- › Host a 3<sup>rd</sup> Performance Psychology Summit (or Psycho-Social-Spiritual Summit).

## Research & Scholarship

- › Evaluate whether the addition of spices and herbs to vegetables (compared to ones without added spices and herbs) can increase vegetable intake among junior enlisted Service Members.
- › Investigate which characteristics make for an effective and efficient team in the Human Performance Teams environment in order to inform future teaming efforts.
- › Develop evidence-based spiritual fitness programs for U.S. Marines.
- › Develop predictive models and an accompanying injury-prevention curriculum for lower-extremity MSK-I and successful return to duty.
- › Evaluate the effectiveness of musculoskeletal injury prevention and/or treatment programs and practices across DoD.
- › Conduct study recruitment, data collection, and analysis using the TEMPPPO app to provide Army National Guard Soldiers with an accessible tool to help improve fitness and readiness.
- › Understand unit/career-field community health and performance needs, and how health and performance providers can support those needs

to improve job performance, mitigate occupational risks, and improve community health outcomes through Community-Based Blueprints.

- › Continue to use the mNEAT app and Go for Green® recipes to improve the military nutrition environment.
- › Continue research on ECAST for improved biologic and clinical markers and management at point of event.
- › Continue data collection to develop the current high-risk criteria for exertion-related injury recurrence into a scoring system to optimize return to duty.

## Education & Training

- › Deliver the MHPO-I curriculum a second time to the National Guard audience and expand the reach to either the Army Reserve or the Air National Guard.
- › Expand promotion of the HPRC website (HPRC-online.org) by leveraging commercials created in 2022 and potentially expanding to radio spots on the Armed Forces Network.
- › Expand the family toolkit for CHAMP's #GotMySix campaign and reach a broader audience with its dissemination.
- › Work with partner organizations to get HPRC materials into military-specific apps.
- › Gather strategic feedback from partners using HPRC materials such as the "TFF Wellness Planner" and "Get Into Fighting Weight Guide."
- › Continue to look for opportunities to align HPO education with college credits.
- › Continue to develop the OPSSup App with the goal to release into the marketplace in 2024.

- 】 Continue to develop the Dietary Supplement Health Professional Module with the goal to release to the DoD audience and beyond in 2024.
- 】 Continue to develop the OPSS Ingredient Database (OPSSID) as part of an ongoing effort to support the *Prohibited List*, the OPSSup App, and other dietary supplement projects.
- 】 Complete development of the OPSS Admin Portal to house the data being collected (past and future) about dietary supplements.
- 】 Maintain the *DoD Prohibited Dietary Supplements Ingredients List* and enhance its search capability.
- 】 As mandated by DoDI 6130.06, continue to provide dietary supplement education for Service Members, healthcare personnel, and allied health professionals across the military community.
- 】 Add a digital educational campaign on all Performance Enhancing Substances (PES) on all OPSS platforms, in addition to expanding the “Let’s Talk Dietary Supplements” social media campaign.
- 】 Expand promotion of the OPSS website (OPSS.org), HPRC website (HPRC-online.org), and social media platforms.

## Operational Support

- 】 Provide direct, accessible, and responsive clinical and operational support across all the Services to enhance the readiness, health, and well-being of all members of the military community.
- 】 Develop metrics to determine CHAMP’s success regarding return to duty of Warfighters, sustained performance, and injury prevention.

- 】 Continue developing a systems-focused approach to bridge CHAMP projects across all HPO/TFF domains and functional areas (education, research, leadership, and operational support), reduce redundancies, and improve processes.
- 】 Increase collaborative efforts with partner organizations and identify new partners to broaden and strengthen CHAMP’s footprint in HPO/TFF within the DoD and federal partner network.

## Overall Internal

- 】 Effectively communicate goals, priorities, and successes.
- 】 Centralize the collection of metrics for all CHAMP programs, and make the information more accessible for sharing with internal and external audiences and tracking metrics.
- 】 Improve CHAMP processes, focusing on those necessary to meet demands for content development and website responses that are time-sensitive.
- 】 Pursue new partners to finance CHAMP programs to ensure sustainable long-term funding.
- 】 Support the CHAMP 2022–2026 Strategic Plan to grow the Operational Support pillar to provide direct, accessible, and responsive clinical and operational support across all the Services to enhance the readiness, health, and well-being of Warfighters, beneficiaries, and their families.

To advancing  
Human Performance in 2023!

# CHAMP



Uniformed  
Services  
University

4301 Jones Bridge Road  
Bethesda, Maryland 20814

<https://champ.usuhs.edu>

<https://www.hprc-online.org>

<https://www.opss.org>

<https://hprc-online.blogspot.com>

## SOCIAL MEDIA

### LinkedIn

CHAMP | <https://www.linkedin.com/showcase/usuchamp>

### Facebook

HPRC | <https://www.facebook.com/HPRCOnline>

OPSS | <https://www.facebook.com/OperationSupplementSafety>

Go for Green® | <https://www.facebook.com/GoForGreenG4G>

### Twitter

HPRC | <https://twitter.com/HPRCOnline>

OPSS | <https://twitter.com/OPSSorg>

### Instagram

HPRC | <https://instagram.com/hprconline>

OPSS | <https://www.instagram.com/opssorg/>

### YouTube

CHAMP | [https://www.youtube.com/@usu\\_champ](https://www.youtube.com/@usu_champ)

HPRC | <https://www.youtube.com/@hprconline>

OPSS | <https://www.youtube.com/@opssorg>

### Pinterest

HPRC | <https://www.pinterest.com/hprconline/>

