DELIVERING INNOVATIVE SOLUTIONS TO THE MILITARY HEALTH SYSTEM TODAY

USU
Uniformed Services University

USU CENTERS
2018 ANNUAL REPORT
### Major health requirements and challenges facing the force and alignment of USU Centers

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Foreword for USU Centers’ Annual Report

The Uniformed Services University (USU) not only serves as the leadership academy for military health, it is a major center for basic and applied research to address current and future threats to the health of the force and our nation. For this reason, the University is a complex research, education and service enterprise. Much of USU’s scientific prowess is based in its Interdisciplinary Centers, which work in concert to address critical health, disease and injury-related problems faced by the military family—and by extension, the nation at large. Given the breadth and complexity of conditions facing US service members and their families, the approach to solving these issues is wide-ranging. Table on page 4.

Each USU Center aligns its mission with DoD priorities or requirements in health, disease and/or injury. The range of their focus spans identifying genetic and environmental causes of, and devising cutting-edge treatments for cancer and complex war injuries to optimizing disaster management and improving the diagnosis and management of blast-related brain injury and psychological stress—including suicide prevention. In this report, one discovers Centers working on new pain management strategies, improving global health and optimizing the physical and emotional resilience of warfighters and their families. Among the products delivered by the Centers are those aimed at improving casualty care in the early phases after severe injury, and those aimed at optimizing service member recovery and function with innovative prosthetics and rehabilitation strategies.

Diversity of mission notwithstanding, a common feature woven through all USU Centers is the emphasis on leadership. Regardless of focus area, all Centers place front and center the role of leadership in ensuring the military-relevance of their work and success in delivering solutions for the warfighter and the broader beneficiary population. The emphasis on leadership in military health research, education and training at USU contrasts to civilian centers as it’s uniquely in-tune with the operational needs of the DoD, geared towards delivering translatable products and developing the next generation of military medical and public health officers. Indeed, all of the Centers featured in this report dedicate substantial time and expertise towards the education and training of students at USU and across the military health system.

Leadership among USU Centers goes beyond programmatic and budgetary oversight and includes operationally-relevant curricula and macro-simulation experiences such as the Gunpowder and Bushmaster field courses. Educational tracts such as the Leader and Leadership Education and Development or LEAD program also provide opportunities to integrate the faculty and staff of the USU Centers with students and trainers. As the nation’s leadership academy for military health, USU and its Centers share this fundamental need, to develop, sustain and engage enlightened, agile and proactive professionals who perform the vital functions of a leader. USU’s Centers advance this ethos by fostering leadership in their laboratories, clinical settings, and across the global health community.

It’s our hope that this 2018 report will give readers an appreciation for the breadth of science and health-related study and service occurring within USU’s Centers—capabilities ranging from development of radiation countermeasures and effective treatments for emerging infectious diseases to simulation-based training to enhance readiness. Equally important, we hope readers will appreciate the military-relevant nature of our Centers’ efforts and their ability to deliver requirements-driven solutions for the DoD. The development and sustainment of leadership in all aspects of military healthcare and health-related research is the common ethos among the Centers, and it is at the heart of their success and uniqueness to USU, the DoD and the nation as large.

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Professor & Vice Chair for Leadership, Centers and Programs
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Todd E. Rasmussen, MD, Colonel USAF Medical Corps
Professor & Associate Dean for Clinical Research Chair, Council of Center Directors

Arthur L. Kellermann, MD, MPH
Professor & Dean, F. Edward Hebert School of Medicine – “America’s Medical School”
Uniformed Services University

MISSION / VISION

To lead the development of a community of culturally mindful and clinically competent providers through the delivery of high-quality training and education, the convening of experts, and the dissemination of research-based treatment and the latest topics in military behavioral health.

Overview

The Center for Deployment Psychology (CDP) was established in 2006.

Goals

Increase the number of mental health providers prepared to treat military personnel and families
Train providers to use evidence-based treatments
Educate providers on the unique stress of deployment
Prepare civilian providers to effectively treat military personnel

Research Highlight

During the calendar year of 2017, CDP trained more than 9,000 behavioral health providers through various training workshops, webinars and seminars. More than 1,000 Department of Defense (DoD) providers attended multi-day workshops on the issue of Evidenced Based Psychotherapies (EBPs) held at various military treatment facilities (MTFs) across the country and overseas. These EBP workshops included treatments for posttraumatic stress disorder (PTSD), depression, chronic pain and evidence-based approaches to address suicidal behavior in the U.S. military. An additional 1,000 plus providers attended similar workshops held using an online delivery platform. These innovative workshops allow CDP trainers to deliver the same learning experience to providers without requiring the entire group of providers to attend the workshops in-person. CDP Presents, our monthly webinar series, was attended by nearly 3,700 participants who had the opportunity to learn about a variety of topics including moral injury, managing anger and working with LGBT service members. In addition, CDP held a series of weekly webinars focused on suicide awareness and prevention in September 2017, Suicide Prevention Awareness Month.

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Deployment Psychology

www.deploymentpsych.org

Executive Director:
David Riggs, PhD

Supporting Services Provided

www.deploymentpsych.org
CDP’s Speaker’s Bureau program responded to more than 30 requests for keynote addresses and clinical workshops that were attended by more than 2,200 individuals at workshops and conferences across the country. In 2017, CDP continued to provide training in support of nine states currently participating in the Star Behavioral Health Providers (SBHP) program. More than 1,000 providers attended SBHP training events, which are designed to enhance civilian behavioral health providers’ preparation to address the needs of service members, veterans, and their families, particularly members of the National Guard and Reserves.

Military Internship Behavioral Health Psychologists: Training the Next Generation of Military Psychologists

The Military Internship Behavioral Health Psychologists (MIBHP) Program provides a CDP psychologist to be assigned to each of 11 MTFs with clinical psychology internship programs accredited by the American Psychological Association. MIBHPs increase force readiness through the clinical supervision and mentorship of interns, the provision of didactic trainings to MTF providers and interns, and support of dissemination and implementation efforts at the MTFs. In 2017, the CDP launched a Training Resource Library (TRL) to serve as a platform for sharing behavioral health training and education materials. The TRL will facilitate the sharing of training and education resources among USU and the clinical psychology internship programs. MIBHPs coordinate and deliver much of this material at each of the training sites.

Supporting Medical Training and Education

Behavioral Sleep Medicine Consultation and Training: Responding to the Needs of the Military Health System (MHS)

CDP endeavors to be responsive to the behavioral health needs of our service members and their families. In 2017, in response to a request from the Army’s Office of the Surgeon General, CDP developed and delivered a workshop to train more than 100 internal behavioral health consultants (IBHC) in the use of Brief Behavioral Therapy for Insomnia (BBTI). In addition to the workshops, CDP faculty provided consultation to these IBHCs as they began to implement BBTI in the clinics. The success of this program has resulted in similar training requests from the Navy and the Air Force.

CDP provided similar training and consultation in management of sleep-related conditions and effective circadian shift work, scheduling to leaders, physicians and psychologists working with service members in the intelligence, surveillance, and reconnaissance and remotely piloted aircraft communities.

The Summer Institute: Preparing for a Career in the Armed Forces

In June of 2017, CDP hosted the third iteration of The Summer Institute. This week-long workshop is aimed at civilian graduate students interested in pursuing a career focused on care for service members, veterans, and their families. During this course, the students are introduced to many of the unique aspects of the military culture as well as the opportunities and challenges of a career as a military psychologist. In 2017, 30 students attended the workshop bringing the total number of attendees to more than 80. Of the students who attended previous iterations of the institute and subsequently applied to internship programs, more than 90 percent report matching with a military or Veterans Affairs internship. A record number of students have applied to attend the fourth iteration of the institute to be held in June of 2018.

Scholarship and Innovation: Advancements in Education and Implementation

CDP works to enhance the training and education of behavioral health professionals and promote the implementation of evidence-based care. In 2017, CDP increased its use of distance-learning models for training, to include a virtual training center developed in Second Life, a virtual world environment. We believe that we are the first in the country to deliver psychotherapy training in a virtual world. Content of these workshops replicates that of face-to-face workshops and program evaluation data indicate that they are positively received and result in equivalent learning.

In 2017, CDP partnered with the Palo Alto VA and STRONGSTAR research consortium on a funded proposal to test a new strategy for promoting the use of EBPs in the MHS. The core of this proposal and the implementation strategy is based on the lessons learned by CDP faculty as we have endeavored to disseminate EBPs across the MHS.

Military Relevance

CDP trains existing and new behavioral health providers to effectively care for the needs of service members and their families including posttraumatic stress disorder (PTSD), depression, suicide, sleep disorders, chronic pain and other consequences of deployment stress.

Federal / Non-Federal Partnerships

- Army Medical Department
- Navy Bureau of Medicine and Surgery
- Air Force Medical Operations
- National Guard Bureau
- Department of Veterans Affairs
- American Psychological Association
- Association of American Medical Colleges
- National Military Family Association
- Defense and Veterans Brain Injury Center
- Center for the Study of Traumatic Stress
- Military Family Research Institute, Purdue
- University Cohen Veterans Network
- National Register of Health Service Psychologists
- American Red Cross
- Henry M. Jackson Foundation for the Advancement of Military Medicine

Support for Medical Education & Training

- Military Internship Behavioral Health Psychologists Program
- Training workshops in evidence-based psychotherapy
- The Summer Institute: Preparing for a Career in the Armed Forces
- STAR Behavioral Health Provider Program
- Brief Behavioral Therapy for Insomnia training for all Internal Behavioral Health Providers
- Military Cultural Awareness for health care providers
Overview

CGHE was formally created in January 2016, with an implementing organization defined in February 2016 and a charter established in April 2016.

Research Highlight

The Center for Global Health Engagement (CGHE) operates in accordance with the Uniformed Services University (USU) 2017-2021 Strategic Framework and provides direct support across USU’s three Mission Domains: Education and Training; Research and Scholarship; and Leadership and Service, all while striving to enhance force readiness. A more detailed account of the center’s training and education offerings for 2017 is listed under “Supporting Medical Training and Education.”

CGHE has formed collaborative and enduring partnerships to enhance support for the DoD GHE community. Partners include stakeholders throughout the DoD, U.S. government agencies, academic institutions and others in the global health space. In 2017, CGHE supported 112 Requests for Assistance from the Office of the Secretary of Defense for Health Affairs (OSD/FAA), the Joint Staff, the Defense Health Agency (DHA), the services, the combatant commands and other stakeholders in the DoD GHE enterprise.
In 2017, CGHE administered the first iteration of the GHE Research Initiative (GHERI), which awarded $6 million in research, development test and evaluation funds to eight principal investigators across the Military Health System (MHS). CGHE led the GHERI breakfast session and the GHE International Partners poster session at the 2017 Military Health System Research Symposium (MHSRS). Also in 2017, CGHE completed the first component of a multi-year engagement with the Defense HIV/AIDS Prevention Program’s (DHAPP) project in Senegal, engaging with DHAPP’s non-governmental organization and Senegalese Armed Forces (SAF) to initiate an evaluation of DHAPP’s contribution to the SAF HIV/AIDS program.

CGHE also expanded its Cooperative Biological Engagement Program (CBEP) portfolio beyond support to country-level engagements. In 2018, CGHE is slated to provide scientific, public health, and regional expertise in support of DTRA-CBEP to help shape engagements in U.S. Central Command (USCENTCOM), U.S. Pacific Command (USPACOM), and U.S. Africa Command (USAFRICOM) Areas of Responsibility. CGHE will play an even larger role in providing Assessment, Monitoring, and Evaluation (AME) expertise so as to enable continuous process improvement, and empower DTRA-CBEP and its implementing partners with value propositions and supporting evidence to encourage increased participation and collaboration.

Also in 2017, CGHE’s African Peacekeeping Rapid Response Partnership (APRRP) program trained 33 new students and 12 instructor candidates, executing four two-week courses in two countries. Students in Rwanda and Uganda took part in Field Sanitation and Medical Planning Courses. The center brought together a dedicated and diverse cadre of instructors from across the services to conduct the courses in addition to some of its own staff. Meanwhile, at the request of USPACOM, CGHE also provided support to the 2017 Asia-Pacific Military Health Exchange (APMHE) Conference held in Singapore, engaging with DTRA, its non-governmental organization and Senegalese Armed Forces (SAF) to initiate an evaluation of DTRA’s contribution to the SAF HIV/AIDS program.

Supporting Medical Training and Education

CGHE develops education and training activities and curricula to support the professional development of current and future MHS GHE professionals to meet GHE capability needs of the Joint Force, other U.S. government (USG) agencies, and partner nations. In 2017, CGHE successfully delivered 13 Fundamentals of Global Health Engagement (FOGHE) courses to over 650 students. FOGHE is an awareness-level course designed to prepare MHS professionals to better conduct GHE activities. FOGHE represents a core line of effort for the center and touches the largest number of MHS professionals of any CGHE program to date. The Global Health Strategies for Security (GHSS) course, held in May 2017, provided the tools for 31 global health professionals to better execute the DoD GHE mission set. Participants hailed from the U.S. military, USG interagency, academia, and the international partner community. GHSS represents the single strategic level GHE training course available to MHS GHE practitioners.

CGHE also supported direct support to USU’s School of Medicine and the Department of Military & Emergency Medicine by conducting the GHE component of the Medical Contingency Medicine Course, enabling over 200 fourth-year medical students to conduct GHE activities within the context of Operation Bushmaster. CGHE also took part in the 18-credit “Graduate Certificate in Global Health and Global Health Engagement” via distance-learning, offered by USU to activate-duty and reserve service members. The center designed a three-credit graduate course on DoD GHE to be taught within the program. The program currently has 160 students enrolled from all four services spread across five continents.

Way Ahead

2018 will feature several milestones, including but not limited to delivering CGHE’s annual GHSS course and at least nine upcoming FOGHE courses. CGHE will also organize the MHSRS GHE breakfast session in August 2018, help support the 2018 APMHE in China, and continue to provide programmatic and AME support to extramural activities under DHAPP, APRRP, and CBEP programs. CGHE will continue to foster USU’s relationship with OASD(HA), the Joint Staff, DHA, the services, and all Combatant Commands as the center increasingly serves as facilitator and reach-back capability for DoD GHE activities around the world, realigning priorities per command request and USU priorities.

FEDERAL / NON-FEDERAL PARTNERSHIPS

OASD(HA), the Joint Staff, the services, the combatant commands, and other stakeholder in the DoD GHE enterprise, and the Henry M. Jackson Foundation for the Advancement of Military Medicine.

CGHE directly supports DoD Instructions 6000.16 and 2000.13 to support DoD end states and U.S. national security objectives.

CGHE supported 112 Requests for Assistance from OASD(HA), the Joint Staff, the services, the Combatant Command, and other stakeholders in the DoD GHE enterprise in 2017.

FEDERAL / NON-FEDERAL PARTNERSHIPS

OASD(HA), the Joint Staff, the services, the combatant commands, and other stakeholder in the DoD GHE enterprise, and the Henry M. Jackson Foundation for the Advancement of Military Medicine.

MILITARY RELEVANCE

CGHE’s mission aligns with the highest expectations of DoD policy to promote and enhance partner-nation stability and security through trust, confidence and resilience to enable implementation of the Guidance for Employment of the Force. CGHE brings much needed technical knowledge and operational support to enhance the capabilities of the combatant commands to conduct effective GHE’s through the following lines of effort:

- Programs and Joint Force Support
- Assessment, Monitoring and Evaluation
- Training
- Research
- Strategic Partnership
- Knowledge Management

REQUIREMENTS/CAPABILITY GAPS

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- Strategic Partnership
- Knowledge Management

USU Centers Annual Report 2018
**Mission / Vision**

Optimize military service member mission performance and family readiness through leadership, community engagement, education, and translation of human performance research.

Be the premier Department of Defense (DoD) translational resource in the complete range of disciplines associated with military-unique Human Performance Optimization (HPO) and Total Force Fitness (TFF) for maximizing military service member readiness and performance and for optimizing the resilience of the global military family. CHAMP strives to become an asset for the U.S. national security community.

**Overview**

The Consortium for Health and Military Performance (CHAMP) was established in November 2012 as a designated Defense Center of Excellence.

**Research Highlight**

Focus: Human Performance Optimization is an end state and grounded through the Total Force Fitness framework. CHAMP provides timely and accurate information on evidence-based strategies to optimize individual performance, nutrition, physical, mental and spiritual fitness, family and social relationships, and success when dealing with environmental challenges. This information is provided via social media and DoD-approved, stand-alone websites, including the Human Performance Resource Center (HPRC) and Operation Supplement Safety (OPSS), community engagement, clinical practice guidelines, and distance and face-to-face educational venues.

**Supporting Medical Training and Education**

Capstone = 1; Residency SOM = 9; Sports Medicine Fellows = 5-8; GSN = 6; MPH = 1; USMC Force Fitness Instruction: ~4-5 classes per year; Tufts = 1; DoD Webinars = 4-6 (Reach 50-300 per session; Other universities and schools = 16.

**Supporting Military Readiness**

CHAMP’s strategic pillars support military readiness: (a) education & training, (b) research & scholarship, and (c) leadership & services (Table 1).

**Funding**

- **Source:** USU, Assistant Secretary of Defense for Health Affairs, Defense Threat Reduction Agency, AFRICOM, Global Emerging Infections Surveillance, DHAPP
- **Period of Performance:** Fiscal year-based sustained
- **Annual Budget:**
  - $3.2 million center O&M funding
  - $8.0 million extramural program funding
  - $6.0 million distributed for GHE research

**Productivity**

- GHE Research Initiative
- Defense HIV/AIDS Prevention Program’s assessment, monitoring and evaluation project
- Defense Threat Reduction Agency Cooperative Biological Engagement Program
- African Peacekeeping Rapid Response Partnership program
- Fundamentals of Global Health Engagement course
- Global Health Strategies for Security course
- AME methodological tools and publications

**Health and Military Performance**

www.usuhs.edu/champ

Director:
Patricia A. Deuster, PhD, MPH
Table 1. Selected Activities and Accomplishments in Support of Military Readiness.

### Selected Educational Activities

- Navy Advanced Medical Department Officer Course: Provide senior Navy Medicine military and civilian leaders skills to manage stress and prevent HPO and TFF knowledge resources and tools.
- Navy Executive Medical Department Enlisted Course: Provide an overview of services and products available through CHAMP’s programs and websites to senior enlisted leaders.
- Defense Threat Reduction Agency: Provide sessions on health, performance nutrition, performance psychology, stress optimization, and physical fitness for STTTA military and civilian staff.
- National Defense University: Provide brown-bag lunch sessions for faculty and students on a holistic approach to optimizing brain health and function.
- Marine Corps University: Provide active learners to students on HPO and TFF.

#### USMCR Force Fitness Course:
- Provide lectures/experiential training on nutrition and dietary supplements.

#### Marine Corps University:
- Provide lectures to students on HPO and TFF.

#### National Defense University:
- Provide brown-bag lunch sessions for faculty and students on a holistic approach to optimizing brain health and function.

#### Marine Corps University:
- Provide an overview of services and products available through CHAMP’s programs and websites to senior enlisted leaders.

### Selected Leadership Activities

- Multiple DoD networking groups and committees.
- Operational Performance Program.
- Operational and Tactical HPO Workshops.
- Air Force Security Forces Defensive Edge.
- U.S. Coast Guard Basic Training/Physical Fitness Programming Review.
- U.S. Marine Corps CJSDF Performance Evaluation and other activities.
- U.S. Army Holistic Health Fitness Workshop.
- Building Healthy Military Communities.
- Go for Green®

### Selected Clinical Services

- Clinical Consultations for Exertion-Related Events.
- Heat Tolerance Testing for return to duty.
- Clinical Practice Guidelines for Exertional Rhabdomyolysis.
- Diet advice for exertion-related heat stress and CFT events.

### Selected Research Projects

#### Exertion-Related Events

- Epidemiology and Genomics of Exertional Related Events in Soldier Cells.
- Exertion-Related Injury Study.
- Behavioral Health Barriers for Prediction and Return to Duty (BEHHeat).
- Biomarkers for Heat Illness in Milus.

#### Musculoskeletal Injury Prevention and Fitness

- Military Exercise Preventing Stress in New Enlistees, Risk of Training (METR3HĐT).
- Predicting and Preventing Musculoskeletal Injury in Basic Training Recruits.
- Evaluation of the CHAMP ACUcore Testing Protocol.
- Association Between Physical Fitness and Musculoskeletal Injury Risk in AF Personnel.
- Evaluation of Marine Physiological Assessment of Combat Training (EPMAC).

#### Nutrition and Dietary Supplements

- Performance-Enhancing Supplements (PES) in USOCCOM forces.
- Vitamin D and Upper Respiratory Tract Infections and Immune Function in HPC BCT.
- Omega 3-Omega 6 Fatty Acids and Behavioral Variations in Milus with a High Fat Diet.
- Dietary Supplements: Knowledge and Adverse Event Reporting Practices Among HCP.
- Validity and Reliability of a New Algorithm to Help Select Safe Dietary Supplements.
- Impact of Fatigue, Low Calorie Intakes and Fat-free Diet on Rate cognition and memory.
- Effects of Various Dietary Ingredients on Stress Reponses of Cells.

#### Behavioral and Spiritual Fitness

- Development and Validation of a Measure of Spiritual Performance.
- Building Healthy Military Communities.
- Team Fitness Tracker.
- Creating Healthy Effective Forces (CHEF).

### Military Relevance

CHAMP is on the cutting edge of readiness, recruitment, and optimizing the lethality of our Warfighters through holistic evaluation and education for unit-career field needs and demands. HPO/TFF concepts and practices are integrated into USU curricula, and Warfighter training across the DoD. CHAMP serves as a unifying force across all services for HPO/TFF-related science and solutions through community engagement.

### Federal / Non-Federal Partnerships

- Partnerships with approximately 100 federal and non-federal organizations through agreements (MDU, MOD), collaborations, and engagements.

#### DoD Examples:

#### Other Federal Examples:
- FDA, FTC, DHA, DHS, NIH IDEO, DOJ, NIH-NCCIH, USCG.

#### Non-Federal Examples:
- Stanford, Ole Miss, USADA, Tufts, the Institute for Integrative Health, USDA, DECA Metro Area, U Arizona Center for Integrative Medicine, UConn’s Korey Stringer Institute, U Lisbon, U Maryland and the Henry M. Jackson Foundation for the Advancement of Military Medicine.

### Support for Medical Education & Training

- CHAMP leads the way in HPO/TFF education through development of curriculum for the USMC Force Fitness Course and webinars/sessions across DoD on dietary supplements, injury prevention, performance nutrition, performance psychology, spiritual fitness, and other HPO/TFF topics.

- Mentors SOM and MPH students, SOM and GSN graduate students, Sports Medicine Fellows, and others, supports Capstone projects and high school, college, and graduate internships.

- USU Capstone = 1; SOM = 9; GSN = 6; MPH = 1; and other Universities and Schools = 16.
MISSION / VISION

The Collaborative Health Initiative Research Program (CHIRP) is a strategic alliance between the National Heart, Lung, and Blood Institute (NHLBI) and the Uniformed Services University (USU). The goal of this interagency endeavor is to transform patient care by harnessing genomics, high-performance computer clusters and bioinformatics to predict and pre-empt disease, mitigate and repair traumatic injury, optimize human performance and resilience, and generate novel personalized therapies that will benefit civilians and service members alike.

Overview

The Collaborative Health Initiative Research Program (CHIRP) was established in October 2014.

Research Highlight

In the first period of performance, CHIRP focused on developing expertise in large-scale whole genome sequencing (WGS) of patient DNA and mRNA taken from hypothesis-based cohorts with comprehensive clinical phenotyping. To date, more than 18,000 whole genomes have been sequenced. The figure below shows the progress in sequencing through 2016-2017 and the largest projects supported. This effort included examining risk and resilience to posttraumatic stress disorder (PTSD) and coinciding conditions such as cardiovascular heart disease (CVD) or major depressive disorder (MDD) in three established cohorts. To date CHIRP has sequenced 1,740 DNAs from the VA's Vietnam-Era Twins Repository of twins who fought in Vietnam and have a unique coincidence of both PTSD, MDD and CVD. Simultaneously, CHIRP sequenced the first 3,000 of the 48,000 samples in the Army STARRS cohort, whose focus is PTSD, MDD and suicidal ideation. Additionally, CHIRP in collaboration with Eric Topol at Scripps Research Institute (SRI) sequenced 1,200 DNAs from the “wellderly” (well elderly) cohort comprising subjects who are more than 80 years old and are also cognitively and cardiovascularly intact. In these and related cohorts, CHIRP focused attention on variants in candidate and genome-wide association studies—sourced genes that could influence susceptibility or resilience to both PTSD and CVD.
FEDERAL / NON-FEDERAL PARTNERSHIPS

Funded principally by NHLBI, CHIRP has ongoing collaborations with National Institute on Aging, National Human Genome Research Institute, U.S. Army, Scripps Institute and the DOD/VA/NIH-sponsored APOLLO Project and the Henry M. Jackson Foundation for the Advancement of Military Medicine. CHIRP currently has 70 ongoing intra- and extramural projects.

SUPPORT FOR MEDICAL EDUCATION & TRAINING

In keeping with the USU academic mission, CHIRP is currently supporting two Capstone projects and developing curriculum relevant to genomic medicine for the UME and GME curricula.

REQUIREMENTS/CAPABILITY GAPS

World class genomic and proteomic center currently working at 85 percent capacity.

Bioinformatics capacity supported by state of the art computing.

Recruiting research clinical geneticist, clinical molecular geneticist to support variant calling pipeline.
MISSION / VISION

Mission: To do great science that improves outcomes for military traumatic brain injury patients.

Vision: In 10 years develop a substantial body of knowledge of what works and what does not work in treatment of TBI.

In five years, implementation of a rigorous, organized and focused TBI research program with twice the funding of today that will have already improved outcomes.

In two years, active execution of multiple interventional studies in parallel with well controlled animal studies.

Overview

The Center for Neuroscience and Regenerative Medicine (CNRM) was established by Congressional mandate in 2008 to study blast-related concussive traumatic brain injury (TBI) in service members at the Walter Reed National Military Medical Center, using advanced imaging facilities at the National Institutes of Health. Since that time, the mission and vision of CNRM has pivoted under the direction of Dr. David Brody to a focus on interventional trials addressing, initially, symptomology of concussive TBI.

The research agenda of CNRM holds high military relevance and is responsive to Department of Defense (DoD) requirements. Between 2000 and the end of the third quarter of 2017, approximately 375,000 service members have sustained a TBI (mostly concussive/“mild”) through deployments, day-to-day activities, occupational exposures, training and sports. While many with a concussive TBI return to normal duty within seven to 10 days, there are those whose recovery is more protracted and complicated by post-concussive symptoms such as headache, trouble with memory, fatigue, sleep disturbances and behavioral changes. Repetitive concussive exposures, such as multiple exposures to blasts from improvised explosive devices, can result in lingering symptoms lasting years. These observations within the military population drive the continuing need to search for medical solutions that will mitigate the effects of TBI and improve readiness of the force.

Collaborations are an important component of the CNRM research agenda. To expedite the CNRM mission, the center has established partnerships with multiple institutions and organizations that serve to expand the scope of expertise and infrastructure available to find medical solutions for our service members with TBI. Our collaborators are represented on page 23.
**MILITARY RELEVANCE**

"The recommendation includes an additional $70,000,000 to increase investigators and research capabilities in Traumatic Brain Injury and regenerative medicine across the Armed Forces." Public Law 110-252

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**Research Highlight**

Over the past few years, CNRM investigators have made novel discoveries in the areas of TBI and posttraumatic stress disorder (PTSD), to include Dr. Daniel Perl’s discovery of a unique blast signature in the brains of service members who have a history of blast exposure. This signature is a scarring at the interface of white and gray matter in the brain, a discovery that has resulted in national attention to include a story on “60 Minutes.”

The future of CNRM lies in interventional studies for TBI in both humans and in animals (rodents and ferrets). Interventions in the clinical trial pipeline are listed in the diagram below.

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**Supporting Military Readiness**

Understanding acute and chronic TBI remains an enduring DoD requirement due to the impact on force readiness. Over the past decade, CNRM investigators have made significant contributions to the body of knowledge of TBI that will inform future clinical trials in TBI. In the next decade, CNRM’s research agenda, with its focus on interventional trials for TBI, holds the promise of delivering real-world medical solutions to mitigate the symptoms of TBI in military populations, thereby facilitating the growth of a ready medical force.

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**Supporting Medical Training and Education**

CNRM is in the process of initiating and funding a new joint USU/NIH/University of Maryland fellowship to train the next generation of military-relevant TBI researchers.
REQUIREMENTS/CAPABILITY GAPS

(JCM)-1-8: Inadequate therapy for shock and head injury
JCM-1-8.1 Inadequate definitive, restorative and rehabilitative therapy for head injury and shock.
IHPE-EPC-PN1 Inability to provide, in advance or on site, countermeasures to prevent morbidity/mortality related to traumatic brain injury (TBI).
EPA(1). Insufficient understanding of the effects of a blast event on neurologic tissue to develop immediate therapeutic and mitigation strategies for long-term negative effects.
TI14. Lack the ability to use modern imaging or emerging biomarkers in the diagnosis of TBI.
MHS9. Lack of capability to objectively and definitively identify and treat TBI/concussion immediately following traumatic event.
Restorative Care: Lack of understanding in the short and long term effects of TBI.


MISSION / VISION

**Mission:** To advance rehabilitative care for service members with combat related injuries, particularly those with blast related orthopaedic trauma, limb loss and neurological complications.

**Vision:** To support synergistic rehabilitative related research across the military health system to optimize treatment strategies in order to promote the successful return to duty and community reintegration of injured service members.

Overview

The Center for Rehabilitation Sciences Research (CRSR) was established in 2011.

Research Highlight

CRSR advances rehabilitative care for military service members with combat-related injuries in the following focus areas:

- Research Focus Area 1: Identifying existing barriers for successful return to duty and/or reintegration into society (e.g., social isolation, peer network support, social media, substance misuse, education, vocation, access to care/resources).
- Research Focus Area 2: Improving pain management strategies to allow participation in rehabilitation to promote optimal recovery and avoid long-term disability (e.g., phantom limb pain, posttraumatic arthritis, residual limb pain, overuse injuries associated with acquired disabilities).
- Research Focus Area 3: Applying new technologies to advance rehabilitative care and improve clinical performance measures (e.g., virtual reality, gait and motion analysis, wearable sensors).
- Research Focus Area 4: Transferring new technologies to improve functionality, in order to expedite the rehabilitation of service members with cognitive or physical trauma (e.g., advanced upper- and lower-limb prosthetics/orthotics, assistive technology aids, wheelchairs and other mobility devices).

FUNDING

Source: Department of Defense - Defense Health Program Annual budget: $15 million (POM)

PRODUCTIVITY

Identification of astroglial scarring in blast-exposed service members.
Unique MRI finding of meningeal enhancement in acute TBI patients.
Successful use of available mobile apps in mitigating PTSD, depression and anxiety.
Supporting Medical Training and Education

CRSR has sponsored more than 20 State of the Science symposiums that have provided continuous medical education (CME) credits for students, faculty, residents, etc. These topics have included (but are not limited to): virtual reality, fitness and health outcomes, traumatic brain injuries, rehabilitation and reintegration, adaptive reconditioning, regenerative medicine, support of family members, and neurokinetic therapy. Further, our center affords staff, residents, fellows and students the ability to participate in world-class, evidence-based rehabilitation research which impacts clinical care.

Supporting Military Readiness

While the importance of rehabilitation following trauma is a widely accepted practice to promote functional recovery, independence and quality of life, evidence to support the correct choice among the variety of rehabilitation interventions is largely empirical. State-of-the-art military rehabilitation programs have been developed over the past decade to care for injured service members returning from Operations Iraqi Freedom and Enduring Freedom, however, many of the espoused rehabilitation protocols have been developed by consensus opinion rather than rigorous scientific methodology. Given the complexity of injuries currently being sustained by war casualties, increasing challenges exist in optimizing rehabilitation, recovery and re-integration.

CRSR provides critically needed research infrastructure within the Military Health System (MHS) to advance rehabilitative care for service members with orthopedic trauma, limb loss and neurological complications. Through Research, Development, Test and Evaluation funding, CRSR supports the development and execution of clinically relevant rehabilitative research studies to be performed within the MHS, particularly at those military treatment facilities most involved in caring for combat casualties. In partnership with Operation and Maintenance-funded partners, CRSR enables providers and scientists to enhance their clinical care mission by engaging in cutting-edge research. Moreover, the center’s location at USU ensures that the discoveries made in rehabilitation science will be widely disseminated, fostering enhanced state-of-the-science education for future health care leaders and policy makers within the MHS, and ultimately resulting in the improved quality of care delivered to Department of Defense beneficiaries now and in the future.

MILITARY RELEVANCE

- Today’s combat casualties are surviving wounds that in prior wars would have been fatal, resulting in increasing challenges for rehabilitation practices.
- War, particularly blast-related trauma, often leads to complex injuries, including traumatic brain injury, extremity trauma and amputation, sensory and peripheral nerve damage, pain syndromes, and psychological health problems – occurring in isolation or in combination.
- Critical research gaps exist within the MHS to advance the rehabilitative care for service members with complex injuries.
- CRSR has the unique capacity to develop, support and execute clinically relevant rehabilitation research studies within the military treatment facilities.

FEDERAL / NON-FEDERAL PARTNERSHIPS

Uniformed Services University (USU), Walter Reed National Military Medical Center (WRNMMC), San Antonio Military Medical Center (SAMMC), the Center for the Intrepid (CFI), Naval Medical Center San Diego (NMCSD), Department of Veterans Affairs, Portsmouth Naval Medical Center, the Extremity Trauma and Amputation Center of Excellence (EACE), the Human Engineering Research Laboratories (HERL), the Center for Neuroscience and Regenerative Medicine (CNRM), Madigan Army Medical Center, National Intrepid Center of Excellence (NICoE), Fort Belvoir, U.S. Military Academy (West Point), U.S. Naval Academy, U.S. Coast Guard Academy, U.S. Air Force Academy, Pepe State University, Johns Hopkins University, Case Western University, University of Utah, University of Miami, University of Tennessee, Bright Cloud International, BSA Athletics, the Henry M. Jackson Foundation for the Advancement of Military Medicine (HJF), and The Geneva Foundation (Geneva).

SUPPORT FOR MEDICAL EDUCATION & TRAINING

- Each research project engages clinical scientists from within the MHS, promoting academic and career development as well as future capacity building for the military.
- CRSR has sponsored more than 20 State of the Science symposiums which have provided continuous medical education (CME) credits for physicians, nurses, therapists, students, faculty, etc.
- Dissemination of work through greater than 100 publications and presentations to national and international audiences.
- Participation in world-class evidence-based rehabilitation research which impacts clinical care.
MISSION / VISION

The Center for the Study of Traumatic Stress (CSTS), established in 1987, is one of the nation’s oldest and most highly regarded academic-based organizations dedicated to advancing trauma-informed knowledge, leadership and methodologies. The center’s work addresses a wide scope of trauma exposure from the consequences of combat, operations other than war, terrorism, natural and human made disasters, and public health threats. CSTS is a part of our nation’s federal medical school, the Uniformed Services University (USU), and its Department of Psychiatry.

Overview
The Center for the Study of Traumatic Stress:
• Develops and carries out research programs to extend our knowledge of the medical and psychiatric consequences of war, deployment, trauma, disaster and terrorism, including weapons of mass destruction.
• Educates and trains health care providers, leaders, individuals, and public and private agencies on how to prevent, mitigate and respond to negative consequences of war, deployment, disasters and terrorism.
• Consults with private and government agencies on medical care of trauma victims, their families and communities, and their recovery following traumatic events, disasters and terrorism.
• Maintains an archive on medical literature related to the health consequences of traumatic events, disasters and terrorism on individuals, families, organizations and communities.
• Provides opportunities for postdoctoral training of medical scientists to respond to and research the health consequences of trauma, disaster and terrorism.

REQUIREMENTS/CAPABILITY GAPS
• Novel rehabilitation strategies for young service members with orthopedic and neurological injuries, especially those with complex injury patterns not seen within civilian rehabilitative and academic settings.
• Readiness and resilience research to support combat casualty care.
• Robust research network and infrastructure to support leading-edge rehabilitative research within the MHS to optimize the successful recovery and community reintegration of service members with war-related trauma.
• Academic and institutional leadership to advance the education and training for students, faculty, residents, etc.

FUNDING
• Annual Budget: ~ $2 million.

PRODUCTIVITY
Knowledge Products:
• $75 million in intramural/extramural funding, more than 20 peer-reviewed publications, more than 190 conference proceedings and more than 20 press releases.
• Correlating clinical and histological markers for ectopic bone.
• Identifying phantom limb pain patterns and genetic linkages.
• Characterizing and treating traumatic brain injuries.
• Evaluating unilateral femoral lengthening for service members with limited residual limb length to enhance prosthetic fitting, independent ambulation and reduced long-term musculoskeletal complications.
• Investigating autologous adipose stem cell enriched tissue transplantation to improve residual limb soft tissue coverage to help service members with limb loss.
• Performing qualitative research to understand barriers to reintegration following injury and discharge to support resiliency.

Material Products:
• Myoelectric prosthetic development for upper limb loss.
• Rapid initial prosthetic fitting for lower limb loss.
• Demonstration of LUKE arm for upper extremity limb loss.
• The Defense Automated Neurobehavioral Assessment tool for cognitive injury.

Planned:
• Evaluation of telerehabilitation for improved access and continuity of care for service members.
• Treatment of musculoskeletal injuries.
• Understanding the cumulative and persistent effects of concussion and repetitive head impact exposure (e.g., mild traumatic brain injury).
• Regenerative medicine.

www.cstsonline.org
Traumatic Stress Suicide Prevention
MILITARY RELEVANCE

The center develops knowledge to address the wounds of war—posttraumatic stress disorder (PTSD), traumatic brain injury depression and wounded families—and is unique in its capacity to bridge military and disaster psychiatry and integrate disaster mental health and public health. In applying the principles and practices for dealing with individuals and groups exposed to extreme environments (in the military), the center has generated and disseminated its subject matter expertise to inform disaster preparedness, response and recovery principles and practices across a wide range of traumatic events and populations. Today and into the future, the center is uniquely positioned to respond to Department of Defense (DoD) mission-relevant activities and issues, as well as educate regional and national stakeholders in government, industry, health care, public health and academia on mitigating the effects of disaster and trauma in the civilian community to foster human continuity and community and national resilience.

FEDERAL / NON-FEDERAL PARTNERSHIPS

CSTS maintains active partnerships with many federal and non-governmental organizations, including the U.S. Army, Navy, Air Force, Marine Corps and Public Health Service; Department of Defense Health Affairs; Department of Homeland Security; Department of Health and Human Services (and internal DHHS agencies such as the Centers for Disease Control and Prevention, the Substance Abuse and Mental Health Services Administration, the National Institutes of Health, and the Office of the Assistant Secretary for Preparedness and Response); Department of State; Department of Justice; National Association of State Mental Health Program Directors; American Psychiatric Association; Armed Forces Retirement Home; The Carter Center; Walter Reed National Military Medical Center and other military health treatment facilities; Harvard University; University of California, San Diego; University of Michigan; Boston University; and the Henry M. Jackson Foundation for the Advancement of Military Medicine.

SUPPORT FOR MEDICAL EDUCATION & TRAINING

CSTS teaches the Neuroscience module, the Substance Abuse micromodule, the Transition to Practice, Operation Bushmaster, IC5/ICR, and the Psychiatry and Family Medicine Clerkships in the Doctor of Medicine program; also teaches in and contributes to Medical Psychology resident training and courses for Master of Public Health students. At Walter Reed, CSTS directs and teaches courses in the NCR psychiatry residency program, trains Navy psychology interns and provides clinical supervision of psychiatry residents as well as direct clinical care to military treatment facilities throughout the NCR.

Supporting Medical Training and Education

CSTS teaches the Neuroscience module, the Substance Abuse micromodule, the Transition to Practice, Operation Bushmaster, IC5/ICR, and the Psychiatry and Family Medicine Clerkships in the Doctor of Medicine program; also teaches in and contributes to Medical Psychology resident training and courses for Master of Public Health students. At Walter Reed, CSTS directs and teaches courses in the NCR psychiatry residency program, trains Navy psychology interns and provides clinical supervision of psychiatry residents as well as direct clinical care to military treatment facilities throughout the NCR.

Supporting Military Readiness

CSTS has a long history of providing knowledge products and consultation to deploying forces and continuing that information support while the units are in theater. Further, information developed by CSTS helps inform military policies.
MISSION / VISION

Mission: To leverage the best available evidence, clinical expertise, and collaboration to develop and communicate consensus recommendations in support of Air Force, Army, Navy, and VHA pain management practice, education, and research.

Vision: The unifying force for military pain management excellence and standardization.

Overview

In 2009, the Department of Defense (DoD) Pain Management Task Force developed a pain management strategy for the Military Health System (MHS). Among the over 100 recommendations from the task force was an overarching requirement for a coordinating/advisory organization to facilitate MHS efforts to standardize and optimize pain management. Defense & Veterans Center for Integrative Pain Management (DVCIPM) was the only MHS organization with the unique combination of pain management historical perspective, clinical and research expertise, and a collaborative network that spans the DoD, Veterans Health Administration (VA) and civilian medicine. Following Assistant Secretary of Defense for Health Affairs concurrence at the April 2011 Senior Military Medical Advisory Committee, DVCIPM has been serving as the coordinating organization for DoD pain management. In January 2014, DVCIPM was realigned under the Uniformed Services University (USU), under the Department of Military and Emergency Medicine.

Established originally as an organization focused on regional anesthesia, DVCIPM’s evolution has paralleled national pain medicine’s evolution over the last 10-plus years, from a narrow, physician- and specialty-centric effort to a focus on providing pain care that is holistic, integrative, multidisciplinary and patient centered. DVCIPM has maintained the MHS presence on the leading edge of national pain management clinical practice, research and education.
Strategic Goals
1. To serve as the unifying force for military pain management excellence and standardization.
2. Maintain the MHS historical perspective on pain management and apply lessons learned to current and future tasks.
3. Enhance collaboration across MHS, VA and civilian pain management activities and initiatives.
4. Translate research findings into clinical care with a focus on products to support the primary care community where the majority of clinical pain management is provided.
5. Champion non-pharmacologic approaches (integrative medicine, self-care, etc.) to pain medicine and provide an evidence base for these approaches.

Focus Areas
Clinical Pain Medicine
Coordinates the DoD translation of evidence-based research on pain management into actionable and sustainable recommendations that optimize delivery of acute and chronic pain management across the clinical continuum for service personnel and their families, from point of injury to recovery whether on the battlefield or at home, improving readiness of the force while also improving efficiency of care delivery.

Pain Research and Technology
Conducts, collaborates and coordinates basic, clinical and translational research in the field of pain management through collaboration with USU, Institute for Surgical Research, Uniformed Service Pain Management Providers, other DoD agencies, academia and industry that share the common goal of providing multi-disciplinary, multimodal pain management focused on improving quality of life and function.

Pain Education and Training
Serves as a proactive resource and clinical subject matter expert for USU, Defense Health Agency (DHA) the uniformed services and other DoD agencies to provide strategic communications through the worldwide web and other media and through consultation on emerging pain management issues that impact readiness, retention, and health of military personnel and their families, e.g., abuse/overuse/diversion of pain medications, unwanted variation in pain management practice, policy and education, and other relevant areas.

Supporting Military Readiness
1. Improving provider understanding and utilization of multimodal pain plans that drive standards of practice beyond medication-only pain management (e.g., opioids) through an increased understanding of non-medication, non-opioid, complementary integrative modalities.
2. Standardizing education, structure and guidance regarding incorporation of Complementary Integrative Medicine (CIM) modalities into the military health care system as measured by increased procedure codes and position descriptions for CIM modalities and providers in medical treatment facilities.
3. Implementing a more effective pain assessment scale that can be used across the continuum of care and provides additional clinical insights into the impact of pain on bio-psychosocial and functional/health aspects of our patients.
4. Enhancing provider and patient understanding of pain medicine through clinical tool development and educational programs that will be measured directly through the PASTOR/PROMIS pain outcomes registry.
5. Developing resources for primary care provider education in order to improve effective management of patients with acute and chronic pain, decrease variability of pain management clinical practice across the enterprise, improve capacity of primary care to provide appropriate pain management care, and optimize referral to specialty pain management services.
6. Establishing core MHS pain management educational content that is integrated into existing MHS medical didactic and training programs.

MILITARY RELEVANCE
The 2010 Pain Management Task Force clearly defined the need for a single DoD pain management advisory organization to focus on policy development, research and curriculum development that will move pain care within the DoD toward a more patient-centered approach, addressing pain over the continuum of care from the onset of pain (battlefield or home) through DoD health care facilities to VHA centers and the community (PMFT Report - 4.4.7).

DVCIPM is the sole DoD organization focused entirely on pain management. DVCIPM has evolved from its original structure/focus of an Army team working primarily on the battlefield trauma aspects of pain medicine, to the current tri-service/VHA, multidisciplinary effort working on application of a truly integrative approach to addressing challenges in pain management.

FEDERAL / NON-FEDERAL PARTNERSHIPS
- HEC Pain Management Work Group
- MHS Pain Management Clinical Support Service
- NIH Interagency Pain Research Coordinating Committee
- National Center for Complementary and Integrative Health Advisory Group
- Clinical and Rehabilitative Medicine Research Program
- Pain Management Scientific Steering Committee
- West Virginia University: statewide response opioid epidemic and pain management capabilities
- Virginia Tech: sharing and adapting MHS pain tools and education content
- University of New Mexico (UNM): adapting UNM Project Echo tele-mentoring initiative for use in MHS
- Henry M. Jackson Foundation for the Advancement of Military Medicine

SUPPORT FOR MEDICAL EDUCATION & TRAINING
Provides support to USU School of Medicine and Graduate School of Nursing.
Collaborates with DHA and services on development and dissemination of patient and provider pain education products and tools.
requires one authorized government civilian position. The remainder of the DVCIPM staff comprises employees from the Henry M. Jackson Foundation for the Advancement of Military Medicine.

FUNDING

Budget: FY15 - $2.64 million FY16 - $2.68 million FY17 - $2.59 million

PRODUCTIVITY

Knowledge Products

- Defense and Veterans Pain Rating Scale (DVPFRS)
- Pain Assessment Screening Tool and Outcomes Registry (PASTOR)
- Joint Pain Education Project (JEEP)
- First Battlefield Pain Management Clinical Practice Guideline
- The Military Advanced Regional Anesthesia and Analgesia (MARAA) Text Book
- Establishing Pain Bio-Bank

Material Products

- Pain Medication Infusion Pump (certified as airworthy)
- JEEP Teaching Guides and Supplemental Videos
- MHS Opioid Prescriber Safety Training

Overview

The Infectious Disease Clinical Research Program (IDCRP) was founded in 2005 under an interagency agreement between Uniformed Services University (USU) and the National Institute of Allergy and Infectious Diseases (NIAID). The program’s work is executed through a unique, adaptive and collaborative international Military Health System-based clinical research network. IDCRP contributes to force readiness by advancing clinical practice and informing health policy for military personnel.

IDCRP: The Military Health System’s Global Clinical Research Network

(17 Partner Commands; 130+ employees; 60 Active Protocols)
**Research Highlight**

IDCRP’s research portfolio includes seven research areas: Acute Respiratory Infections, Deployment and Travel-related Infections; Emerging Infectious Diseases and Antimicrobial Resistance; Human Immunodeficiency Virus; Skin and Soft-Tissue Infections; Sexually-Transmitted Infections; and Trauma-Related Infections.

**Supporting Medical Training and Education**

In FY17, supported 25 graduate students, medical students, residents and ID fellows. Three students from the Naval Postgraduate School also conducted IDCRP-mentored analyses. Trainees presented 13 oral and poster presentations at national conferences and published five manuscripts.

**Supporting Military Readiness**

- Clinical practice guideline for travelers diarrhea in deployed service members aimed at mid-level military practitioners in field and deployed setting
- Over 6,000 active duty and beneficiaries enrolled in longitudinal study of treated HIV infection; informing policy implications related to assignment options for AD with HIV
- Phase 2 vaccine trial targeting Staph aureus initiated among recruits at Ft. Benning
- Military recruit cohort study completed documenting burden and etiology of respiratory disease, assessing transmission among trainees, to inform prevention strategies
- Investigating the impact of emerging pathogens in the U.S., Coccidioides fungus and tick-borne Borrelia bacteria on health and readiness of service members at disease-endemic military installations
- Supporting DoD efforts for prevention, diagnosis, and treatment of sexually-transmitted infections
- Trauma Infectious Disease Outcomes Study (TIDOS) systematically collected infection-related outcomes of military personnel wounded during deployment 2009 - 2014. Follow up continues from cohort enrollees through the MHS and VA. Findings are addressing knowledge gaps in prevention and management of combat-related infections to assist with Joint Trauma System (JTS) clinical practice guideline initiatives and antimicrobial stewardship.

**Military Relevance**

IDCRP provides MHS with a clinical research network capability focused on military-relevant infectious disease threats to Readiness and Population Health; to assess interventions including materiel and knowledge product solutions to mitigate those threats.

**Federal / Non-Federal Partnerships**

In FY17, IDCRP had partnerships with 26 academic institutions, 15 military hospitals & clinics, seven military research and public health commands (including overseas research detachments), four U.S. government health agencies, six research organizations and industry partners, five foreign health agencies and organizations. IDCRP efforts are supported by the Defense Health Agency, Navy Bureau of Medicine and Surgery, Congressionally-Directed Medical Research Program, Military Infectious Disease Research Program, Armed Forces Health Surveillance Branch, USU Center for Global Health Engagement and the Henry M. Jackson Foundation for the Advancement of Military Medicine.

**Funding**

Sources (FY17): NIAID (IAA); DoD-DHP; Army – MRMC (Military Infectious Disease Research Program); Navy Advanced Development; DHA (AFHSB/GEIS; Immunization Healthcare Branch); USAF (59th MDW); FDA

Annual Budget: $23 million

**Requirements/Capability Gaps**

IDCRP’s mission aligns with the Military Health System (MHS) Quadruple Aim, focusing on efforts that inform Force Readiness and address Population Health, as well as cost-effectiveness analyses that inform Cost of Care.

Primary deliverable is maintaining capability for clinical trials to advance products and solutions for infectious disease threats relevant to the Joint Warfighter.

**Support for Medical Education & Training**

In FY17, 25 graduate students/medical students/residents and ID fellows were supported. Three students from the Naval Postgraduate School also conducted IDCRP-mentored analyses. Trainees presented 13 oral and poster presentations at national conferences and published 5 manuscripts.
MISSION / VISION

Mission: Improve cancer diagnosis and interdisciplinary treatment of Department of Defense (DoD) beneficiary patients through innovative clinical care, research and education.

Vision: As the only DoD-designated Cancer Center of Excellence, Murtha Cancer Center is the nexus of cancer services and support for the MHS with clinical and translational cancer research programs fully integrated with USU, Walter Reed National Military Medical Center (WRNMMC), National Cancer Institute (NCI) and the Department of Veterans Affairs.

Overview

The John P. Murtha Cancer Center Research Program (MCCRP) was established in September 2011 and USU chartered in January 2016.

Research Highlight

Focus Areas

• Precision Medicine – Proteogenomics; Women’s Malignancies; Military Population Sciences and Epidemiology; Urologic Malignancies; Inflammation, Infection, Immunoology, and Stroma (IIIS); Biorepository and Data Management; Evidenced-based Models for Cancer Management in Military Health Care Facilities

Future Directions

• Enhance military readiness through improved prevention, prognosis and therapy, including immunotherapy, and quality-of-life by precision medicine (improved stratification and targeted therapy).

Planned Deliverables

• Primary deliverable is maintaining capability for clinical trials to advance products and solutions for infectious disease threats.
• Ongoing Phase 2a Staphylococcus aureus vaccine trial at Fort Benning.
• Collaboration with the Military HIV Research Program to initiate a trial of a therapeutic HIV vaccine in FY19.

Knowledge Products

- Published a clinical practice guideline for the management of acute watery diarrhea among military personnel in a special supplement of Military Medicine.
- Presented 32 posters and 15 oral presentations at regional/national/international conferences and had 36 manuscripts accepted/published.
- Sponsored 2017 American Society of Tropical Medicine and Hygiene annual meeting symposium highlighting deployment-related infectious disease threat mitigation studies.

Materiel Products

- TaqMan Array Card PCR for use in diagnostics related to travelers’ diarrhea
- New serologic and PCR methods to improve detection of newly emerging Borelia species
- PCR-based assay for fungal identification to support diagnosis of invasive fungal wound infections was developed and is undergoing evaluation

PRODUCTIVITY

Knowledge Products

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Future Directions

- Enhance military readiness through improved prevention, prognosis and therapy, including immunotherapy, and quality-of-life by precision medicine (improved stratification and targeted therapy).
MCCRP focuses on research into cancers of particular interest to the active-duty military. 1,000 active-duty members a year are diagnosed with cancer; MCCRP seeks to obtain those tumors to perform molecular studies at USU labs including The American Genome Center (TAGC) which can lead to better treatments and fewer side effects, increasing readiness. The Deputy Assistant Secretary of Defense, Health Readiness Policy and Oversight developed the cancer Initial Capabilities Document for the Joint Staff to document capability requirements, shortfalls and solution recommendations for cancer in the military. The desired effect is that cancer is prevented, screened for, detected, treated, cured and rehabilitated or the impacts of cancer treatments are mitigated so service members have the form and function desired to return to duty, re-classify to a new duty position or reintegrate into civilian life with the highest possible quality of life. MCCRP integrates USU with MCC to provide robust tri-service clinical cancer research integrated within NCR and throughout the MHS for many cancers, but specifically in three multidisciplinary translational cancer research programs: Center for Prostate Disease Research (CPDR), Gynecologic Cancer Translational Center of Excellence (GYN-COE) and the Clinical Breast Cancer Project (CBCP). MCCRP focuses on research designed to address cancer prevention, screening, treatment, rehabilitation and survivorship of service members, beneficiaries and veterans who suffer from cancer, including translating research and development into novel and innovative treatment and rehabilitation options.
FUNDING

MCCRP is executed by the Uniformed Services University (USU) in partnership with non-federal, non-profit entities based on cooperative agreements or awards with military medical treatment facilities, laboratories, tissue repositories, and other research facilities throughout the Military Health System (MHS), and other federal and non-federal partners. Cancer research and initiatives at the Murtha Cancer Center (MCC) and MCC-sponsored military treatment facilities (MTFs) throughout the MHS are funded and coordinated through this program.

SUPPORT FOR MEDICAL EDUCATION & TRAINING

The MCCRO through the CPOR, CRCP and GYN CoE supports research, clinical and surgical training for Oncology fellows, residents, interns and USU medical students throughout the year.

REQUIREMENTS/CAPABILITY GAPS

Source: Deputy Assistant Secretary of Defense, Health Readiness Policy and Oversight cancer Initial Capabilities Document (ICD) 2016

The Joint Force lacks sufficient understanding of the mechanisms behind cancer metastasis. The Joint Force lacks sufficient strategies to prevent as well as to screen for the detection of cervical cancer and other gynecologic cancers, breast cancer, colorectal cancer, melanoma, prostate cancer, lung cancer, other military-relevant cancers.

The Joint Force lacks sufficient therapeutic interventions for the treatment of cancer in SMs, including for the treatment of recurrent cancer.

The Joint Force lacks sufficient ability to rehabilitate SMs with cancer and support long-term survivorship in these individuals.

The Joint Force lacks sufficient long-term follow-up data and the coordination/documentation of this data (e.g., registries, databases) from SMs with a history of cancer.

PRODUCTIVITY

Knowledge Products

- Identified HVT1 as a prognostic biomarker, and a predictive pharmacodynamic biomarker of response to metformin treatment in endometrial cancer.
- ERG inhibitor (ERGi-USU) for prostate cancer therapy (issued patent 2017, CPOR-Stanford Medical School CRADA 2017: present)
- Serum based prognostic biomarker panel of prostate cancer (patent applications 2015-2017, Berg Health CRADA from 2013-present)
- Developed a novel ovarian cancer cell line model of chemoresistant disease.
- CRCP has achieved full accreditation by the National Accreditation Programs for Breast Centers through September 2018.
- CRCP contributed more than 10 percent of the total of 1,000 samples to The Cancer Genome Atlas Project.
- The CRCP biorepository is currently accredited through the CAP’s Biorepository Accreditation Program through April 2018.
- Established and validated significant racial differences of common prostate cancer driver genes (ERG, PTEN)
- Created ovarian and uterine cancer registries for patient-reported outcomes.

Overview

The National Center for Disaster Medicine and Public Health (NCDMPH) was founded in 2008.

Research Highlight

- The center conducts research, hosts training and education events, and produces podcasts as well as webinars to share information with those in the disaster field. NCDMPH staff also share information about their work through presentations at conferences and events, as well as published articles in peer-reviewed journals.
- Dr. Tom Kirsch assisted in planning the National Academies of Sciences, Engineering, and Medicine’s Engaging the Private Sector Health Care System in Building Capacity to Respond to Threats to the Public’s Health and National Security Workshop in Washington, D.C., on March 20 and 21.
- The National Center has developed, tested and released several Stop the Bleed (STB) educational tools (a website, mobile application, video, audio instructions and printable instruction card) to teach lay-people how to stop life-threatening bleeding through pressure and tourniquet application. To learn more visit stopthebleed.usuhs.edu.
- The National Center provides financial and administrative support for the publication of high-quality science for Disaster Medicine and Public Health Preparedness. Visit the journal at https://bit.ly/2DfvJvZ.
MILITARY RELEVANCE

NCDMPH provides important readiness expertise to the services and the National Guard Bureau. NCDMPH consults on Department of Defense disaster preparedness exercises, provides opportunities to publish lessons learned and extends the military Tactical Combat Casualty Care principles into lay person training, facilitating the bridging of battlefield lessons to the American public. Additionally, NCDMPH consults on Humanitarian Assistance Disaster Response activities and preparation with the U.S. government.

FEDERAL / NON-FEDERAL PARTNERSHIPS

Federal: DoD; Department of Health and Human Services
Office of the Assistant Secretary for Preparedness and Response; National Institutes of Health, Centers for Disease Control and Prevention; Department of Veterans Affairs; Veterans Health Administration; Department of Homeland Security; Federal Emergency Management Agency; Department of Transportation; Federal Interagency Committee on EMS; Public Health Service Headquarters; Naval War College; NORTHCOM.

Non-Federal: American Red Cross; Johns Hopkins University Applied Physics Lab; National Academy of Sciences, Engineering and Medicine; World Bank; National Association of City and County Health Officials; Alliance for Continuing Education in the Health Professions; George Washington University; Natural Hazards Center at University of Colorado; National Center for Disaster Preparedness at Columbia University; the Henry M. Jackson Foundation for the Advancement of Military Medicine.

SUPPORT FOR MEDICAL EDUCATION & TRAINING

• PMO 1009, Katrina Strauss-Riggs
• PMO 613, CAPT Paul Reed
• Vice Chair, Education in MEM, Craig Goolsby
• Grand rounds
• Service on PMB Global Health curriculum consortium
• Service on SOM student promotions committee
• Launching Education Rotation for Disaster Health Science
• Host MPH practicum students

Supporting Medical Training and Education

Recent Accomplishments

• Supported NORTHCOM and hosted After Action Report of Puerto Rico response
• Attended “pre-exercise” in anticipation of Ardent Sentry 2018
• Conducted follow-up work with Puerto Rico Dept. of Public Health and School of Medicine
• Submitted grant with San Antonio Military Medical Center and Armed forces Radiobiology Research Institute to optimize online vs. in-person CBRNE DoD training
• Model Uniform Core Criteria for Mass Casualty Triage Instructional Guideline Addendum released.
• Stop the Bleed Education Consortium

Current Key Projects

• Review of federal disaster health training programs: Assessment of current federally sponsored disaster training courses
• State of Disaster Science Review: Review of the funding and products of disaster research in U.S. medicine, public health, social sciences, applied engineering
• Work with Naval War College on HA/DR review and civil military education/research agenda
• Crisis Leadership in Disasters Symposium in conjunction with USU Center for the Study of Traumatic Stress and the USU Leadership Education and Development

Supporting Military Readiness

NCDMPH provides important readiness expertise to the services, NORTHCOM and the National Guard Bureau. NCDMPH consults on DoD disaster preparedness exercises, provides opportunities to publish lessons learned and extends the military Tactical Combat Casualty Care principles into lay person training, facilitating the bridging of battlefield lessons to the American public. Additionally, NCDMPH consults on Humanitarian Assistance Disaster Response activities and preparation with the U.S. government.
REQUIREMENTS/CAPABILITY GAPS

Additional funding from several core federal partners (Departments of Health and Human Services and Veterans Affairs, specifically) is required.

NCDMPH transitioned from MEM to PRS this year; the financial tracking has not yet transitioned.

Budget management and administrative support at USU is a gap.

FUNDING

Source: Department of Defense base funding of $1.1 million, variable partner funding ($50-500k)
Annual Budget: $1.2 million

MISSION / VISION

The Surgical Critical Care Initiative (SC2i) is a Uniformed Services University Center, funded by the Department of Defense, Defense Health Program. SC2i was established in 2013 to develop biomarker-driven clinical decision support tools (CDSTs) for the critically ill, with the goal of improving clinical outcomes and reducing costs across the injury/disease cycle.

A consortium formed of both Federal (Uniformed Services University, Walter Reed National Military Medical Center, Naval Medical Research Center) and non-Federal (Duke, Emory, DecisionQ, Henry M. Jackson Foundation) entities, SC2i facilitates tissue acquisition and data analysis to improve decision-making algorithms. The methods developed by the Center are expected to help maximize outcomes across any discipline requiring complex medical decision making, including surgery, critical care, emergency medicine, orthopedics, transplant and oncology.
Research Highlight

Building on a legacy of 320 service members injured during OEF/OIF, 1,200 additional critically ill civilian and military patients have been prospectively enrolled under four trials since October 2014. Recognized by the Department of Defense for its focus on ‘Precision Medicine’, the SC2i is functioning under Good Clinical Laboratory Practices (GCLP) across its molecular core laboratories.

In its short existence, the Center has already developed or deployed three CDSTs (predicting sepsis, the incidence of invasive fungal infection, and the need to activate a massive transfusion protocol) and is leveraging its growing databank to develop a battery of predictive algorithms for conditions associated with high mortality and morbidity (e.g. venous thromboembolism, acute kidney injury, acute respiratory distress syndrome, bacteremia, pneumonia). Use of these tools is expected to generate substantial cost savings in both civilian ($10 billion) and military ($111 million) health system.

Supporting Military Readiness

Within its first year of funding, SC2i deployed a vitally important CDST to predict the occurrence of Invasive Fungal Infection (IFI) in the combat-wounded. Other predictive models currently being developed (timing of surgical debridement and activation of mass transfusion protocols) will further assist readiness by either accelerating return to duty (abridged length-of-stay across the ICU, general ward, and rehabilitation continuum of care) or curbing logistical burdens (e.g., reduced need for blood products and airlifts) during conflicts.

Military Relevance

SC2i predictive models will support readiness by either accelerating return to duty (abridged length-of-stay across the ICU, general ward, and rehabilitation continuum of care) or curbing logistical burdens (e.g., reduced need for blood products and airlifts) during conflicts.

Federated / Non-Federated Partnerships

SC2i is a consortium of both federal (Uniformed Services University, Walter Reed National Military Medical Center, Naval Medical Research Center) and non-federal (Duke, Emory, DecisionQ, Henry M. Jackson Foundation for the Advancement of Military Medicine) entities.

SC2i also collaborates with other USU centers, to include the Infectious Disease Clinical Research Program - Trauma Infectious Disease Outcomes Study (IDCRP-TIDOS) and the Collaborative Health Initiative Research Program (CHIRP).

Support for Medical Education & Training

In keeping with its sponsoring institution’s educational mission, SC2i annually supports six medical students via the CAPSTONE Initiative, five surgical residents (fellows), as well as students from the U.S. Navy and U.S. Army (from FY18) military academies.

As a USU Center, SC2i positions itself at the crossroads of Research (developing clinical decision support tools for the critically wounded warfighter) and Education (embedding students and residents into its translational studies), and is thus uniquely positioned to support the next conflicts by maintaining critical-care currency for the battlefield surgeons of tomorrow. Annually, the SC2i supports five surgical residents, ten or more USU medical students, and three cadets from the military academies.

Supporting Military Readiness

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MISSION / VISION

Mission: To collect, analyze and report oral health care information, provide dental public health education, and support the Military Health System so that timely, data-driven decisions can be made for:

• the development of oral health care policies and programs to achieve optimum dental readiness and to improve the oral health-related quality of life for all authorized beneficiaries.
• the creation of greater awareness and understanding of military oral health care issues.
• maximizing the efficiency of the military’s oral health care delivery system.
• the advancement of programs that identify environmental and behavioral causes of oral disease and the countermeasures needed to overcome those factors.

Vision: To be the premier organization within the DoD globally supporting the military mission through exceptional dental public health research and education.

Overview

The Tri-Service Center for Oral Health Studies (TSCOHS) was established in 1997 by the Tri-Service Dental Chiefs.
Research Highlight
Focus areas include supporting Defense Health Agency (DHA) mandate of assessing satisfaction of dental care by eligible beneficiaries; service-specific requests for data, data analysis and characterization of private sector care dental expenditures; supporting faculty and postgraduate dental resident oral health research.
- Deliverables – Knowledge Products
- Department of Defense (DoD) Dental Patient Satisfaction Survey results and analysis
- Service-specific, stratified private-sector care dental expenditure reports
- Research proposals
- Data analysis (sometimes with the aid of statisticians)
- Co-authored manuscripts
- Dental Public Health academic resources, including lectures/briefs/presentations

Supporting Medical Training and Education
- Number of CAPSTONE residents supported: 6
- Number of residents supported: 20
- Other students or civilian institutions supported: 0

Supporting Military Readiness
TSCOHS contributes to growing a “ready medical force” by educating and training postgraduate dental residents in disciplines associated with the delivery of oral health care and by creating and supporting research opportunities to advance oral health knowledge and expertise. Additionally, research and analysis performed by TSCOHS and provided to DHA and the services supports data-driven policies and guidance to ensure currency for providers in oral health knowledge and clinical skills.

Way Ahead
- Increasing collaboration and research with other Uniformed Services University (USU) centers (currently only with Murtha Cancer Center)
- Expanded role in formal education for postgraduate dental residents in areas of research methodology, epidemiology, population health and ethics

MILITARY RELEVANCE
Supporting military readiness by providing data-driven clinical and population health research.

FEDERAL / NON-FEDERAL PARTNERSHIPS
Federal
- Army, Navy and Air Force
  - Service-specific research needs
  - Private sector care dental expenditure characterization
Defense Health Agency
- Administer the DoD Dental Patient Satisfaction Survey
- Oral Health SMEs for TRICARE Dental Readiness and Wellness Source Selection Board

Support for Medical Education & Training
- Develop, advise and mentor postgraduate dental residents with clinical and public health research
- Teach/lecture postgraduate dental residents about dental public health disciplines, ethics, epidemiology and research methodology
- Data support for resident and service-specific research

Requirements/Capability Gaps
Requirements:
- One qualified representative from the Army, Navy and Air Force
- IT resources capable of integrating/communicating with both USU and service-specific networks
- Budget capable of supporting travel to conferences or off-site collaborations

Capability Gaps:
- Number 1 above - lacking Army representative
- Number 2 above
USU Centers Annual Report 2018

MISSION / VISION
The MISSION of TSNRP is to facilitate nursing research to optimize the health of military members and their beneficiaries.
TSNRP Priority Areas include:
• Force Health Protection
• Nursing Competencies & Practice
• Leadership, Ethics & Mentoring

Overview
The mission of the TriService Nursing Research Program (TSNRP) is to facilitate nursing research to optimize the health of military members and their beneficiaries.
TSNRP was originally established in 1992 following a small appropriation from Congress to fund military nursing research. Today, TSNRP is funded through the Department of Defense and has awarded over 420 grants totaling more than $100 million, resulting in research published in more than 60 peer-reviewed journals. TSNRP is directed and supported by the Army, Navy and Air Force Nurse Corps Chiefs. It is the only program that specifically funds and supports rigorous scientific research in the field of military nursing.

Research Highlight
TSNRP supports excellence in military nursing in the following ways:

o Educational Courses
• Evidence-Based Practice (EBP) Workshop for Military Nursing and Readiness to strengthen EBP skills for use in the hospital and deployed settings
• Grant Camp to develop strong proposals for funding
• Dissemination course to share project results and learn from others
• Writing workshop to focus on scholarly writing of articles, clinical guidelines and technical reports

o Resources
• Biannual newsletter focused on emerging research and EBP results
• Research and EBP books, software, consulting and other resources
• Social media community connecting military nurse scholars
• Collaboration through multiple research interest groups, including Anesthesia, Biobehavioral Health, Expeditionary Nursing, Health Systems/Informatics, Military Family and Women’s Health

FUNDING
$90,000 each from Army, Navy and Air Force (USU claims a 27.78 percent on-site rate providing cost recovery, leaving TSCOHS with $64,998)
$48,000 from DHA for USU contractor support of the DoD Dental Patient Satisfaction Survey
Period of Performance: Annually (FY)
Annual Budget: $64,998

PRODUCTIVITY
Knowledge Products
• Administer and report results from the DoD Dental Patient Satisfaction Survey
• Dental Private Sector Care expenditure analysis, characterization and reporting to the services
• Dental and population health expertise to the TRICARE Dental Readiness and Wellness source selection board
• Academic and research guidance to postgraduate dental residents
• Oral health expertise and collaboration with other USU centers
• Dental public health and population health research for the DoD and the services
• Data and data resources for education and the services
• Recruit Oral Health Studies

Material Products
None

Nursing Research
www.usuhs.edu/tsnrp

Director:
Lt Col Jennifer Hatzfeld, PhD, RN
Supporting Nursing Training and Education

- EBP Workshop is hosted at individual military treatment facilities offered two to three times per year (earning 10-14 continuing education units (CEUs)).
- Dissemination Course is a three to four day course offered once a year for about 300 participants (earning 18-25 CEUs).
- Grant Camp is a five-day course offered once a year for about 18 participants (earning 35 CEUs).
- Writing Workshop is a three-day course offered once a year for about 12 participants.
- TSNRP provides additional courses focused on research or evidence-based practice depending on the identified educational need. Previous courses include: Introduction to Research, Social Network Analysis, Joanna Briggs Institute Systematic Review Training and EBP Leadership.
- In 2017 TSNRP provided seven courses for over 400 registered nurses within the Military Health System, with over 7,000 CEUs awarded.

Supporting Military Readiness

- TSNRP published a Battlefield and Disaster Nursing Pocket Guide with evidence-based nursing clinical guidelines in 2008, which is currently under revision.
- Over 84 funded research studies have informed nursing practice and policy to improve military readiness, including:
  - Development of the Air Force Nursing Readiness Skills Program (Bridges, 2008)
  - The Readiness Estimate & Deployability Index (Keene, 1998; Desmou, 2000 and 2005)
  - Mental Health and Resiliency (Garner, 2011; Hernandez, 2014; Weidlich, 2015; Weiss, 2011)
  - Global Health Engagement Missions (King, 2015; Turner, 1997)

Supporting Medical Education & Training

As part of the TSNRP strategic plan, continuing education courses focused on research or evidence-based practice are regularly provided to approximately 400 military nursing personnel each year. There are three recurring courses with 4-6 additional courses on varied topics, based on identified educational needs.

FEDERAL / NON-FEDERAL PARTNERSHIPS

Executive Board of Directors (EBOD)

Grantee Organization
Advisory Council

MILITARY RELEVANCE

TSNRP is directed and supported by the Army, Navy and Air Force Nurse Corps Chiefs. It is the only program that specifically funds and supports rigorous scientific research in the field of military nursing.
REQUIREMENTS/CAPABILITY GAPS

TSNRP has four strategic goals:

• Develop and strengthen the TriService community of nurse scholars to generate new knowledge in military nursing and translate it into practice
• Provide a TriService infrastructure to enhance military nursing research and advance evidence-based practice
• Support research and evidence-based practice projects on areas relevant to military readiness and military nursing practice
• Encourage TriService collaboration in nursing research and evidence-based practice.

FUNDING

Source: DoD Programmed Budget through USU
Period of Performance: indefinite
Annual Budget: $7 million (O&M funds)

Competitively funded research and EBP awards to non-profit organizations and universities, up to $450,000
EBP funds transferred to military treatment facilities through a mini-EBP award, up to $10,000

PRODUCTIVITY

Historical Products from TSNRP-Funded Projects:

• 1999 Readiness Estimate & Deployability Index
• 2004 Military Nursing Outcomes Database (MNOD)
• 2008 Battlefield and Disaster Nursing Pocket Guide (2nd edition currently under development)
• 2011 Patient CaringTouch System – U.S. Army Nursing Practice Model
• 2015 Sus scrofa (swine) ventricular fibrillation model for physiologic research

In 2017/2018 TSNRP Provided:

• Seven courses to 400+ RNs within the Military Health System; over 7,000 continuing education hours awarded
• Military Women’s Health searchable evidence database (available at www.triservicenursing.org/database/womenshealth)
• 2017 Nursing Outlook Supplement on Military Nursing (16 peer-reviewed articles published)
• 2018 Critical Care Nurse Special Issue on En Route Care (nine peer-reviewed articles published)