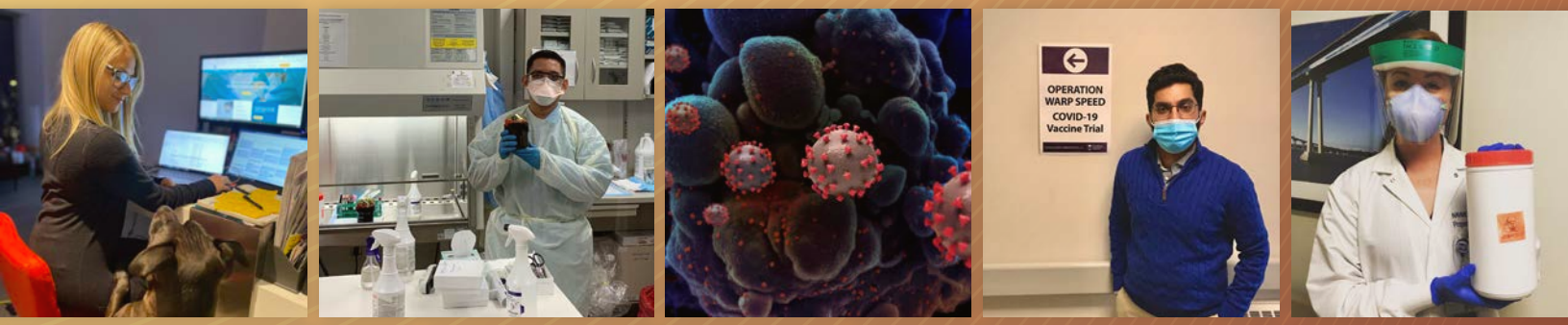
IDCRP

Uniformed Services University

INFECTIOUS DISEASE CLINICAL RESEARCH PROGRAM



2020

ANNUAL REPORT

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LETTER *from* IDCRP LEADERSHIP

The emergence of the novel pathogen, SARS-CoV-2, and the ensuing COVID-19 pandemic during the past year resulted in multiple new challenges for the infectious disease clinical and research community. Integral to the COVID-19 response of the Department of Defense (DoD), the Infectious Disease Clinical Research Program (IDCRP) of the Uniformed Services University of the Health Sciences (USU) has met the challenges posed by the pandemic through innovative execution of militarily-relevant, clinical infectious disease research designed to improve the health of service members and beneficiaries, support advancements in clinical care throughout the Military Health System (MHS), and connect military public health surveillance of emergent and high-impact pathogens with DoD research and materiel solution development efforts (e.g., vaccines, drugs, and diagnostics). As part of the response to the COVID-19 pandemic, a new IDCRP research area was established to directly focus on SARS-CoV-2.

Over the past year, the IDCRP rapidly activated multiple research studies focused on COVID-19 at various clinical sites within the IDCRP Partner Network. In particular, the IDCRP is leading the DoD arm of the National Institute of Allergy and Infectious Diseases (NIAID) Adaptive COVID-19 Treatment Trials, which led to the Emergency Use Authorization and subsequent approval of remdesivir for treatment of the disease. Other research studies have examined characteristics and outcomes of infection, seroprevalence among military healthcare workers, and diagnostic methods. Findings from these studies have informed mitigation strategies utilized by the DoD. Despite the priority shift in focus for many investigators to COVID-19 efforts, activities continued within the other five IDCRP research areas with many accomplishments, which are outlined in the following report.

The lasting success of the IDCRP results from the unique clinical research network partnerships with NIAID, Combatant Commands, clinicians in the MHS and biomedical research and development programs, collaborators from the Veterans Affairs Healthcare System, academia, and industry partners. Robust support from USU leadership, along with the Operational and Executive Steering Committees and cooperative execution through the Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc., have been a vital part of the IDCRP's success. Funding through, and cooperative partnership with, the Defense Health Program, USU, NIAID, U.S. Army Medical Materiel Development Activity, the Military Infectious Diseases Research Program, the Navy Bureau of Medicine and Surgery, and the Armed Forces Health Surveillance Division and Immunization Healthcare Division of the Defense Health Agency have enabled our mission accomplishments.

We would like to commend and thank our clinical research and support staff, as well as our active-duty and civilian investigator partners, for their perseverance during this challenging year. It also goes without saying that military service members and beneficiaries who volunteer their time to participate in our studies have been instrumental. It is a privilege to serve with such an exceptional team.

Core values: Collaboration, Innovation, Quality, Adaptability, Dedication

Success Is Defined By: Informing military health policy and practice through translation of research findings; Publications and presentations within impactful and relevant peer-reviewed journals/forums; Capability to respond to emergent infection threats and/or high-priority research initiatives; and Key stakeholder satisfaction

Timothy H. Burgess, MD, MPH
Captain, Medical Corps, U.S. Navy
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Mark P. Simons, PhD, MSPH
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Science Director, IDCRP

ABOUT IDCRP

The Infectious Disease Clinical Research Program (IDCRP) was founded in 2005 under an interagency agreement between the Uniformed Services University of the Health Sciences (USU) and the National Institute of Allergy and Infectious Diseases (NIAID) and through a cooperative agreement with The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc. (HJF). The Program's work is executed through a unique, adaptive and collaborative, international clinical research network. This network directly affects force readiness by advancing clinical practice and informing health policy for military personnel.

In collaboration with partners from the Department of Defense (DoD), academia, government, and industry, IDCRP supports a broad clinical research portfolio within the Military Health System. From observational, longitudinal cohort studies to field-based interventional trials to the evaluation of long-term health outcomes, IDCRP conducts protocols that address critical knowledge gaps in the control and prevention of infectious disease in the military. Study outcomes have far-reaching implications for public health and disease prevention beyond military communities.

PROGRAM ORGANIZATION

Executive Steering Committee

Dean, School of Medicine, Uniformed Services University of the Health Sciences (USU),
Chief, Division of Clinical Research (DCR), National Institute of Allergy and Infectious Diseases (NIAID)
Director, Research, Development and Acquisition, Defense Health Agency (DHA)

Operational Steering Committee

Surgeons General Infectious Disease Consultants—Army, Navy, Air Force

Director, Armed Forces Health Surveillance Division

Director, Military Infectious Diseases Research Program, MRDC

Chief, Collaborative Clinical Research Branch, DCR, NIAID

Chair, Department of Preventive Medicine and Biostatistics, USU

Veterans Affairs Representative (non-voting)

HJF Representative (non-voting)

Program Coordination Center

Program Director

Science Directorate

Science Director
- Deputy Science Director
- Associate Science Director
- Research Area Directors
- Chief, Quality Management
- Clinical Research Managers

NIAID Liaison

Chair, Scientific Review Board

Deputy Program Director

Research Administration Staff

Regulatory Affairs Staff

Chief, Program Operations and Finance

Program Management and Finance Staff

Data Coordination Center

Chief, DCC

Data Configuration, Management, and Programming Staff

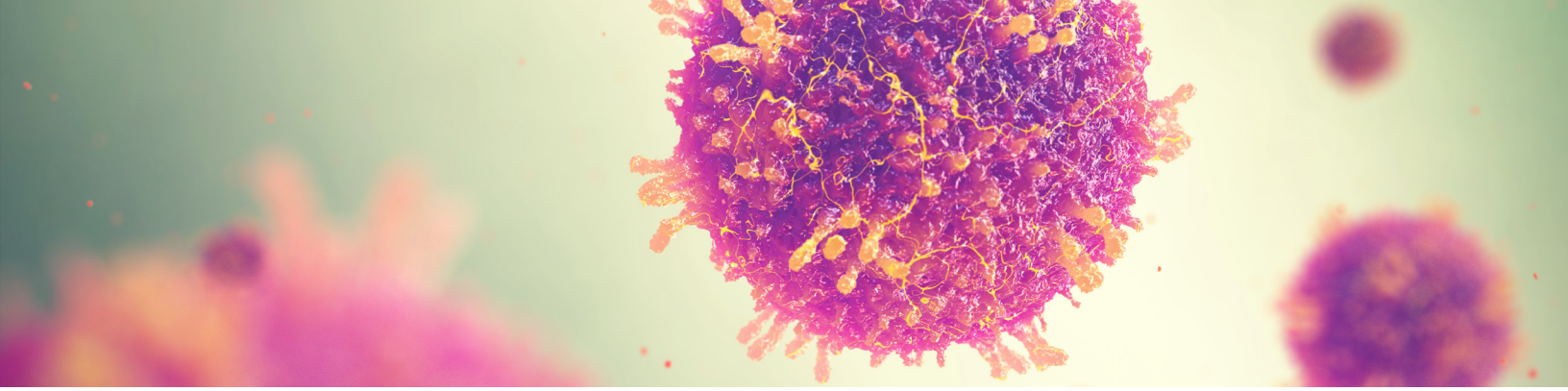
Partner Organizations

Military Hospitals

Military Research and Development Commands

Military Public Health Commands

Non-DoD Partners



VISION

To substantially reduce the impact of infectious diseases in the military population through collaborative clinical research.

MISSION

To conduct multicenter infectious diseases clinical research, focusing on high-impact cohort and interventional trials, to inform and improve care of the Warfighter.

IDCRP RESEARCH AREAS

- **COVID-19—**Strategic aims focus on improving the speed and accuracy of diagnostics to include the diagnosis of infectious hosts, epidemiology and transmission dynamics, characterization of acute-to-chronic phenotype and immunopathological correlates of SARS-CoV-2 infection, risk prediction, and treatment and preventive approaches.

- **Acute Respiratory Infections—**Strategic aims focus on diagnostics, prevention (influenza vaccine), epidemiology (respiratory threats in training settings), and treatment (severe influenza) of acute respiratory infections among U.S. military personnel and their beneficiaries.

- **Deployment and Travel-Related Infections—**Strategic aims focus on epidemiology of deployment and travel-related infectious threats for military personnel, pre-travel health care and mitigation strategies, novel methodologies for identifying pathogens associated with febrile and diarrheal disease, and improved treatment approaches during deployment.

- **Human Immunodeficiency Virus Infections—**Strategic aims include mitigating specific complications of the virus among military HIV-infected patients; identifying, treating, and preventing HIV-associated neurocognitive disorders; developing and employing predictive models to optimize individual management of HIV; and improving therapeutic outcomes with the ultimate goal of functional cure of infection.

- **Sexually-Transmitted Infections—**Strategic aims focus on development of improved means to diagnose, prevent, and treat sexually-transmitted infections, with particular focus on emergent drug-resistant gonorrhea, among active-duty members and their beneficiaries.

- **Wound Infections—**Strategic aims focus on addressing knowledge gaps in infection prevention, clinical management, and treatment outcomes in battlefield trauma to inform DoD Joint Trauma System clinical practice; development of effective strategies for the prevention and control of skin and soft-tissue infections, particularly *Staphylococcus aureus*-related, among congregate military personnel in deployment and training settings; and improved understanding of wound microbiology impact on clinical outcomes related to high-threat virulent and antimicrobial-resistant pathogens.

Each area's 2020 accomplishments are presented in the following pages, along with information and projections for 2021.

SARS-COV-2 AND COVID-19

The COVID-19 pandemic has imposed a considerable burden on the Military Health System (MHS) and substantially affected operational readiness. The emergence of this novel pathogen has left the research and medical community racing to fill in extensive knowledge gaps and develop diagnostic assays, treatments, and prophylactic measures. As the hub of military clinical disease research, IDCRP formed a new research area specific to COVID-19 and developed a comprehensive and adaptive portfolio of both observational and interventional studies to meet the dynamic Force Health Protection needs, as well as a rapidly evolving regulatory and scientific landscape for SARS-CoV-2 countermeasures.

Simon Pollett, MBBS, IDCRP Associate Science Director and COVID-19 Research Area Director

The sudden emergence of the COVID-19 pandemic resulted in a need for the IDCRP to pivot its core infrastructure and form a new research area specific to the novel pathogen, SARS-CoV-2, while also being militarily relevant, adaptable to the emergence of new science and the changing needs for Force Health Protection, and sustainable. Led by Dr. Simon Pollett (Research Area Director and IDCRP Associate Science Director), the overall goal of the COVID-19 Research Area is to improve the detection, prediction, treatment, prevention, and functional outcomes of COVID-19, with overarching relevance to Force Health Protection and clinical practice in military health service beneficiaries. During the past year, the COVID-19 Research Area has developed a wide-ranging clinical research portfolio, which includes multiple newly developed protocols (**Table**).

As the immediate response to the COVID-19 pandemic, the Epidemiology, Immunology and Clinical Characteristics of Emerging Infectious Diseases with Pandemic Potential (EPICC) protocol was prioritized and sponsored through the Defense Health Program to serve as a primary foundation for military clinical research and response with regard to SARS-CoV-2. Led by Dr. Brian Agan, EPICC is a prospective, longitudinal observational cohort study of SARS-CoV-2 infections in active-duty service members and DoD beneficiaries with the goal of addressing critical knowledge gaps to further the understanding of the natural history of this novel pathogen and inform and support the development of diagnostic, treatment, and preventive strategies. The study population includes patients with confirmed SARS-CoV-2 diagnoses or COVID-like illness who are hospitalized or treated as outpatients, as well as asymptomatic individuals with a high risk of exposure. The study is active at ten military treatment facilities (MTFs) with the inclusion of additional sites planned. More than 1,000 individuals are currently enrolled in EPICC with the majority being treated as outpatients. Furthermore, a new online enrollment module has the potential of enrolling more than 10,000 subjects.

Through EPICC, valuable data on demographics, clinical characteristics, comorbidities, clinical course of illness and outcomes, and immunology are being collected and analyzed. In collaboration with USU and non-USU laboratory partners, specimens obtained through EPICC are being assessed using molecular, serological, and other immune assays to characterize the virologic and immune phenotypes of SARS-CoV-2 infections in MHS beneficiaries. In addition, existing prognostic scoring systems and other predictive biomarkers (e.g., body mass index and inflammatory cytokines) are being validated

The EPICC / ACTT studies recruiting team at Brooke Army Medical Center

Blood being drawn by Mr. Wesley Robb-McGrath at Madigan Army Medical Center

through EPICC studies. Toward the end of 2020, EPICC increasingly focused on identifying the longer term pulmonary and extrapulmonary sequelae of COVID-19.

With the deployment of military personnel and clinicians in response to the surge of SARS-CoV-2 cases in New York City, risk of exposure and subsequent infection was a serious concern. Led by CAPT Karl Kronmann, serologic responses among military personnel on the USNS Comfort were assessed to determine the cumulative incidence of COVID-19 cases. Through a separate protocol, led by COL Kevin Chung, serologic responses were also evaluated among two units of military personnel working at the Javits Center, of whom 66% had direct interaction with patients with confirmed COVID-19 diagnoses. These studies highlighted that infection control measures in these deployed personnel were effective.

The acquisition of healthcare-associated, asymptomatic SARS-CoV-2 infections is being examined through the Prospective Assessment of COVID-19 Seroconversion and Shedding (PASS) study. Led by Dr. Edward Mitre, PASS will examine the rate of asymptomatic infections among healthcare personnel, baseline prevalence and antibody responses to common coronaviruses, and whether pre-existing antibody responses to other coronaviruses affect the severity of SARS-CoV-2 illness.

As a result of crowded living conditions, the high prevalence of acute respiratory infections among military trainees is well recognized and is a source of concern regarding transmission of SARS-CoV-2. Led by Dr. Eugene Millar, the Observational Seroepidemiologic Study of COVID-19 at the U.S. Naval Academy (TOSCANA) will evaluate the prevalence of SARS-CoV-2 serum antibodies among midshipmen after a full respiratory disease season (i.e., one academic year). Along with longitudinal collection of blood and saliva samples, buccal swabs will also be collected to assess host genetic risk factors for disease severity. As part of another protocol, and through collaboration with the University of Notre Dame and Walter Reed Army Institute of Research Emerging Infectious Diseases Branch, modeling is underway to simulate the relative effectiveness of mask adherence, rapid frequent testing, and different cocoon sizes in an artificial trainee population.

Led by COL Eric Garges, the Prospective Investigation of SARS-CoV-2/COVID-19 Epidemiology and Serology (PISCES) will determine the prevalence and incidence of SARS-CoV-2 infections among enrollees at the Uniformed Services University of the Health Sciences. The association between occupational-, household-, and community-level risk factors with risk of SARS-CoV-2 infection will be comprehensively examined. In addition, the study will evaluate the association between baseline SARS-CoV-2 antibody seroprevalence and the rate of medically-attended acute respiratory infections caused by SARS-CoV-2. Immunologic responses are another focus of the study with examination of the host immune response to SARS-CoV-2 and the influence of symptom/disease severity on the magnitude of the immune response, as well as correlations between humoral and mucosal immunity following exposure to the novel pathogen. Lastly, differences in SARS-CoV-2 infection rates by age groups will be assessed.

LCDR Derek Larson and Ms. Lizoralia Brandon of the EPICC study team at Fort Belvoir Community Hospital

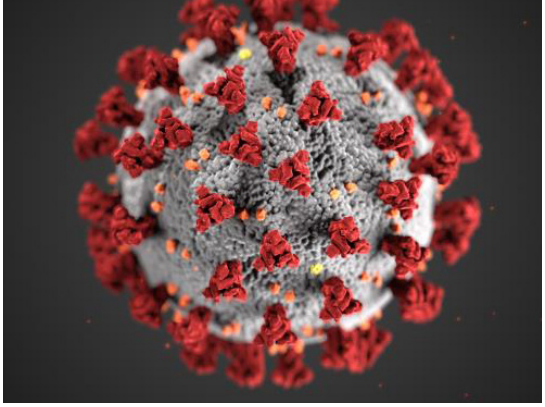
Table. IDCRP COVID-19 Research Portfolio

PROTOCOL	STUDY TYPE	SITES
Protocols Developed in Response to COVID-19 Pandemic		
ACTT: A Multicenter, Adaptive, Randomized Blinded Controlled Trial of the Safety and Efficacy of Investigational Therapeutics for the Treatment of COVID-19 in Hospitalized Adults	Interventional (ACTT-1 & ACTT-2 complete; ACTT-3 completed enrollment; ACTT-4 enrolling)	Brooke Army Medical Center (BAMC); Madigan Army Medical Center (MAMC); Naval Medical Center Portsmouth (NMCP); Naval Medical Center San Diego (NMCSD); Tripler Army Medical Center (TAMC); Walter Reed National Military Medical Center (WRNMMC); Womack Army Medical Center (WAMC)
CAMP-NY: COVID-19 Antibody Prevalence in Military Personnel Deployed to New York	Observational (completed)	Javits Center (New York)
COMFORT: Prevalence of Novel Coronavirus by PCR and Antibodies among Personnel Deployed on the USNS COMFORT During the COVID 19 pandemic	Observational (completed)	USNS Comfort; NMCP
PASS: Prospective Assessment of COVID-19 Seroconversion and Shedding	Observational	WRNMMC; Naval Medical Research Center (collaboration)
PISCES: Prospective Investigation of SARS-CoV-2/ COVID-19 Epidemiology and Serology	Observational	Uniformed Services University of the Health Sciences (USU)
TOSCANA: The Observational Seroepidemiologic Study of COVID-19 at the United States Naval Academy	Observational	U.S. Naval Academy
STORMCHASER: A Phase III Randomized, Double-blind, Placebo-controlled, Multi-center Study in Adults to Determine the Safety and Efficacy of AZD7442, a Combination Product of Two Monoclonal Antibodies, for Post-exposure Prophylaxis of COVID-19	Interventional	MAMC; NMCP; TAMC; USU; William Beaumont Army Medical Center (WBAMC)
Simulation of COVID-19 Outbreaks among Recruits	Prediction modeling	Walter Reed Army Institute of Research Emerging Infectious Diseases Branch (collaboration); University of Notre Dame (collaboration)
Existing Protocol Modified to Support COVID-19 Research		
EPICC: Epidemiology, Immunology and Clinical Characteristics of Emerging Infectious Diseases with Pandemic Potential	Observational	**Existing IDCRP Partner Network sites:** BAMC; MAMC; NMCP; NMCSD; TAMC; WRNMMC **New IDCRP sites engaged/expanded in 2020:** Carl R. Darnall Army Medical Center; Fort Belvoir Community Hospital; WAMC; WBAMC

During the past year, IDCRP has been a key collaborator on the National Institute of Allergy and Infectious Diseases (NIAID), Division of Microbiology and Infectious Diseases, international multicenter Adaptive COVID-19 Treatment Trials (ACTT). Led by CAPT Ryan Maves, adult active-duty service members and DoD beneficiaries hospitalized with COVID-19 at five MTFs were enrolled and two Phase 3 trials were completed, of which one assessed use of intravenous remdesivir (ACTT-1), supporting first the U.S. Food and Drug Administration (FDA) Emergency Use Authorization and the subsequent FDA approval for COVID-19 treatment, and the other examined use of remdesivir alone compared to remdesivir plus baricitinib (ACTT-2). In addition, at seven MTFs, IDCRP enrolled subjects for ACTT-3, a Phase 3 trial to assess use of remdesivir plus Interferon-β compared to use of remdesivir and a placebo. Lastly, IDCRP is supporting enrollment at seven MTFs for ACTT-4, which is assessing use of remdesivir plus dexamethasone compared to remdesivir plus baricitinib. IDCRP's engagement in other COVID-19 countermeasure clinical trials includes augmenting staff at five MTFs in the AstraZeneca Phase 3 vaccine study and coordination of five DoD sites for a post-exposure monoclonal antibody prophylaxis Phase 3 clinical trial.

In 2021, IDCRP will continue to evaluate and revise the COVID-19 Research Area portfolio based on both the needs related to Force Health Protection and the constantly changing

Laboratory analysis of SARS-CoV-2 specimens at Naval Medical Center San Diego



SARS-CoV-2 (Credit: CDC/Alissa Eckert and Dan Higgins)

LTC Charlotte Lanteri working remotely on the EPICC protocol

SARS-CoV-2 research landscape. Existing cohort studies, such as EPICC, will be leveraged with DoD and non-DoD laboratory partners (e.g., NIAID and FDA) and include further examination of long-term sequelae following SARS-CoV-2 infections. Existing observational protocols are primed to conduct studies evaluating post-licensure vaccine effectiveness and safety in the coming year. An objective of the research area in 2021 will be to increase visibility of IDCRP findings with relevant end-users, such as the Armed Forces Health Surveillance Division and senior U.S. military leadership, through use of recurring, structured reporting.

MILITARY IMPACT

During the past year, the emergence of the novel SARS-CoV-2 strain and resulting COVID-19 pandemic rapidly became a substantial and ongoing threat to U.S. Armed Forces and the MHS. In response, the EPICC protocol was revised and activated with early findings related to the risk of re-infection in service members included in briefings to the Deputy Secretary of Defense. The Program also evolved to engage the threat by pivoting its infrastructure to develop and conduct multiple new protocols designed to fill knowledge gaps and inform mitigation strategies for the MHS. Moreover, IDCRP is engaged with military leaders to support Operation Warp Speed with post-licensure vaccine effectiveness studies and a trial to examine the prophylactic efficacy of monoclonal antibodies is also planned. Throughout the year, IDCRP senior leadership have briefed MHS senior clinicians through the DoD Joint Trauma System monthly/bimonthly COVID-19 updates and have provided input during weekly COVID-19 "Think Tank" meetings with key representatives from the Defense Health Agency. The registry of active-duty COVID-19 cases through the Joint Trauma System was codesigned by IDCRP senior leadership and surveillance data gathered through the registry are utilized in high-level briefings in the MHS. Overall, efforts of IDCRP have been integral to the MHS response to the COVID-19 pandemic.

HIGHLIGHTS/KEY FINDINGS

- **IDCRP supported the NIAID-sponsored double-blind, placebo-controlled trial of intravenous remdesivir in adults hospitalized with COVID-19 and evidence of lower respiratory tract involvement (ACTT-1), enrolling subjects at five MTFs. Patients who received remdesivir had a shortened time to recovery (median: 10 days; 95% confidence interval [CI]: 9-11 days) compared to control patients (median of 15 days: 95% CI: 13-18 days). These findings supported the use of remdesivir in hospitalized patients who require supplemental oxygen therapy.**
- **IDCRP is supporting Operation Warp Speed through augmenting MTF sites, which are enrolling subjects in the AstraZeneca vaccine trial. In addition, IDCRP is coordinating DoD sites in the upcoming AstraZeneca Phase 3 clinical trial assessing the prophylactic efficacy of monoclonal antibodies targeted to the SARS-CoV-2 virus.**
- **Through the EPICC study, a symptomatic SARS-CoV-2 re-infection (polymerase chain reaction [PCR] confirmed) was characterized in a male military healthcare provider 51 days after resolution of initial infection following a new household exposure. Even this single case provided useful insights into the risk of re-infection in MHS beneficiaries.**
- **Overall incidence of SARS-CoV-2 among crew members of the USNS Comfort was low, likely the result of active surveillance and successful mitigation with use of personal protective equipment and infection control strategies.**
- **Low prevalence of IgG SARS-CoV-2 antibodies among military healthcare professionals stationed at the Javits Center in New York City indicated successful mitigation with the infection control strategies enacted at the site.**

ACUTE RESPIRATORY INFECTIONS (ARI)

As demonstrated by the recent influenza outbreaks and the pandemic caused by SARS-CoV-2, acute respiratory infections (ARIs) are a significant source of morbidity among military trainees, deployed service members, and DoD beneficiaries. Among active-duty service members, approximately 400,000 clinical visits and 30% of hospitalizations per year are the result of ARIs, affecting not only the health of personnel, but also imposing a direct impact on operational readiness.

Christian Coles, PhD, ARI Research Area Director

The high rate of ARI outbreaks among military personnel largely stems from the virulence of known respiratory pathogens, diagnostic difficulties, and limited effectiveness of preventive measures (e.g., vaccines), coupled with the intensified potential for wide-ranging transmission due to crowded and stressful living conditions. The overall goal of the ARI Research Area is to substantially reduce the burden of ARIs in military populations by supporting the development of effective control strategies designed to limit the impact of ARIs on health, performance, and mission readiness. ***For information on research efforts related to SARS-CoV-2, please see the COVID-19 Research Area section (pages 4-7).***

The Pragmatic Assessment of Influenza Vaccine Effectiveness in the DoD (PAIVED) clinical trial (led by CAPT Timothy Burgess), now in its third year, is designed to identify if there are clinically meaningful distinctions in the effectiveness and immunogenicity between different influenza vaccine formulations (i.e., egg-derived, cell-culture-derived, and recombinant licensed vaccines) to improve operational readiness. The study was initiated in 2018 with enrollment occurring at five military hospitals. During the second year of the study, the number of military hospitals expanded to nine and enrollment more than doubled with approximately 85% of participants responding to at least one weekly flu survey during follow-up. Through the immunogenicity substudy, cell-based vaccine samples from the 2019-2020 influenza season were tested for antigenicity with results being shared with the World Health Organization collaborating laboratories and reported to strain selection committees.

As the effectiveness of influenza vaccines in active-duty personnel has been reported to be low, the Impact of Influenza Vaccine Experience on Effectiveness protocol (sponsored by the National Institute of Allergy and Infectious Diseases, Division of Microbiology and Infectious Diseases), is assessing the impact of repeat immunizations on the acquisition and severity of influenza in the Military Health System (MHS). Due to a shift in research priorities to focus on COVID-19, data analysis is now expected to be completed in 2021.

A central protocol of the ARI Research Area is the multisite, longitudinal ARI Consortium Natural History Study (ARIC NHS), led by CAPT Burgess, which was established in 2009 to collect data on the etiology, epidemiology, and immunology of influenza-like illness (ILI) and severe ARI in the military. Through ARIC NHS, surveillance reports are provided to key stakeholders, such as the Armed Forces Health Surveillance Division, Global Emerging Infections Surveillance program, and Naval Health Research Center. Data collection for ARIC NHS was suspended in 2019 in order to reallocate personnel and resources to support PAIVED.

Data analysis for the Flu Breath Study, led by Lt Col Brian White in collaboration with Menssana Research Inc., was completed in 2020. Active-

COL Mancuso receiving instruction on blood self-collection for PAIVED at the Uniformed Services University of the Health Sciences

2019 PAIVED study team at the Marine Corps Recruit Depot

duty personnel at McWethy Troop Medical Clinic who sought outpatient care for ILI were enrolled in the protocol and breath samples were collected to assess use of exhaled volatile organic compounds to support influenza diagnosis. Preliminary findings suggest that breath testing may be useful as part of the diagnostics toolkit for influenza. The next steps involve validation of the prediction algorithm in a blinded cohort.

Led by Dr. Christian Coles, the goal of the Study to Address Threats of ARI in Congregate Military Populations (ATARI) is to evaluate the transmission, etiology, and epidemiology of ILI among U.S. Army trainees at Fort Benning, GA. Preliminary examination of spatial and temporal patterns of ILI transmission has been completed. In addition, human coronavirus 229E specimens collected from the trainees have undergone whole genome sequencing and genomic evaluation of a sample of parainfluenza viruses is planned.

In 2021, enrollment in PAIVED and analysis of the data will continue to be a major focus of the ARI Research Area; however, enrollment in the 2020/21 influenza season may be limited due to social distancing in response to the COVID-19 pandemic. Testing of ILI specimens collected through PAIVED for SARS-CoV-2 is planned to explore the relationship between influenza and COVID-19. As a follow-on to the Anonymous Survey Among Trainees study, ways to provide further access and improve education related to handwashing for trainees is being explored. A longitudinal ATARI study is also being developed with the objective of describing patterns of ILI acquisition and transmission in large trainee populations. Furthermore, the potential to expand ARI surveillance analyses to include the deployed setting, such as shipboard and ground force populations, are being discussed.

MILITARY IMPACT

Influenza is consistently ranked as among the highest infectious disease threats to U.S. Armed Forces. Data collected through the ARI Research Area and findings from the resultant studies have furthered the understanding of ARIs with regard to the evolving distribution, risk factors, and control in the MHS. In particular, hospital-based surveillance provides key data on the epidemiology, clinical severity, and disease burden of high-priority pathogens that may directly affect operational readiness. Moreover, findings from PAIVED and the Influenza Vaccine Experience studies may provide insight to account for disparities in vaccine effectiveness in military personnel and beneficiaries (19% versus 51%) and support development of improved influenza vaccinations and vaccine policies for the MHS. Furthermore, findings from ATARI and anonymous surveys expand information on transmission patterns and healthcare seeking behavior to inform education interventions and reduce the risk of ARI transmission among congregate military populations, such as trainees.

HIGHLIGHTS/KEY FINDINGS

- **More than 5,900 participants were enrolled during the second year of the PAIVED clinical trial (>7,500 enrollees total) with >370 subjects enrolling in the immunogenicity substudy. Approximately 35% of enrollees had an ILI with a median duration of 10 days. Molecular testing of nasal specimens for 1,440 ILI cases has been completed.**
- **Whole genome sequencing of nasopharyngeal swabs from U.S. Army trainees at Fort Benning positive for human coronavirus 229E (HCoV-229E) determined that the spread of the disease on the base in 2017 resulted from four distinct viral introductions.**
- **Disease severity among influenza subtypes (A/H1N1, A/H3N2, and Influenza B) was assessed in 157 ARIC NHS enrollees. While A/H3N2 had a significantly higher upper respiratory symptom score compared to A/H1N1, there were no statistical differences in lower respiratory, gastrointestinal, systemic, and total symptom severity between the three subtypes. Influenza season and female sex were associated with influenza symptom severity.**

DEPLOYMENT AND TRAVEL-RELATED INFECTIONS

With the global deployment of U.S. Armed Forces for combat and humanitarian operations, as well as training activities, service members are at risk of developing infectious diseases that pose not only a substantial threat to the health of personnel, but also greatly impact military operational readiness.

Tahaniyat Lalani, MBBS, MHS, Deployment and Travel-Related Infections Research Area Director

Among DoD travelers and deployed active-duty service members, infectious diseases are frequently reported with travelers' diarrhea (TD), vector-borne illnesses (e.g., malaria and Dengue virus), and respiratory diseases being the most common. Mitigating the considerable impact of these infections through epidemiologic surveillance and high-quality research to improve preventive and therapeutic approaches is a priority for the Military Health System (MHS). The overarching vision of the Deployment and Travel-Related Infections Research Area is to enhance infectious disease preparedness and Force Health Protection of U.S. military forces prior to and during deployment.

With more than 4,500 DoD travelers and deployed service members enrolled, the cornerstone of the research area is the Deployment and Travel-Related Infectious Disease Risk Assessment, Outcomes, and Prevention Strategies among DoD Beneficiaries (TravMil) cohort study. Led by Dr. Tahaniyat Lalani, 125 service members deployed to high-risk regions for endemic disease were enrolled in TravMil during 2020 prior to a pause in enrollment due to the COVID-19 pandemic (enrollment reengagement in 2021). The most common infectious disease reported among the new enrollees was TD followed by influenza-like illness (ILI).

Due to the considerable impact that TD has on military operational readiness, one of the primary aims of the research area is to evaluate the safety and effectiveness of novel preventive and treatment strategies for TD, with a focus on conducting clinical trials that are relevant to Force Health Protection. In collaboration with the United Kingdom Ministry of Defence (U.K. MOD), enrollment and follow-up were completed in 2019 for the Trial Evaluating Regimens of Rifaximin for Chemoprophylaxis Against TD (Prevent TD). Led by CAPT Ramiro Gutierrez, Prevent TD is the first clinical trial to compare two high-dose regimens of rifaximin for the prevention of TD in deployed military personnel. Overall, 449 subjects were enrolled with 343 subjects comprising the intent-to-treat analysis. Data analysis is nearing completion and includes an examination of the impact of the variability in regional risk of TD, pathogen distribution, and adherence to recommendations in the austere deployment environment on the efficacy of rifaximin.

Two additional clinical trials in partnership with the U.K. MOD are anticipated to begin enrollment in 2021. First, the clinical efficacy of different nutraceutical products (i.e., probiotic, prebiotic, and passive immunoprophylaxis) for the maintenance of gut health during deployment and travel in service members will be assessed in the P4 placebo-controlled clinical trial. The P4 trial will be also conducted in collaboration with the New York Center for Travel and Tropical Medicine. Second, as a follow-on to the successful Trial Evaluating Ambulatory Therapy of TD (TrEAT TD) clinical study, which demonstrated the effectiveness of a single high dose of rifaximin (1,650 mg) with adjunct loperamide for treating acute watery diarrhea, TrEAT TD 2.0 will assess the efficacy of a lower dose of rifaximin (550 mg) versus azithromycin (500 mg); both with adjunct loperamide therapy. Enrollment will target personnel deployed to the British Army Training Unit in Kenya, as well as U.S. personnel serving at the Soto Cano Air Base in Honduras.

Major Andrew Greenhalgh, Cpl Alice Mills, Sqn Ldr William Nevin, Cpl Abi Haffenden, Cpl Jodie Melina and Major Tom Troth of the U.K. Ministry of Defence team at the British Army Training Unit in Kenya

CAPT Ramiro Gutierrez at the British Army Training Unit in Kenya

LH Esther Adeyeye conducting laboratory work at British Army Training Unit in Kenya

Led by COL Patrick Hickey, the Knowledge, Attitudes, Practice and Outcomes Study (KAPOS) is surveying travel medicine and deployment health providers with regard to knowledge of infectious disease threats and prescription practices. Funded by the U.S. Army Medical Materiel Development Activity, KAPOS data are being used to complete a U.S. Food and Drug Administration-required post-licensure safety surveillance study of Tafenoquine, which was recently approved for use as malaria chemoprophylaxis and radical cure of *Plasmodium vivax* in the MHS.

In 2021, there are plans to optimize surveillance efforts for high-priority infections within each area of responsibility using a combination of redeployment and post-deployment surveys (such as used with TravMil), continued and expanded partnerships with DoD laboratories, and further engagement with Force Health Protection and Combatant Command leadership to maintain military focus. In addition, surveillance for SARS-CoV-2 will be incorporated into existing protocols.

MILITARY IMPACT

Through the conduct of clinical trials focused on preventive and therapeutic approaches, as well as the continued efforts related to surveillance of high-priority, militarily-relevant infectious disease threats, the Deployment and Travel-Related Infections Research Area has greatly added to the evidence base for deployment-related clinical practice guidelines. Through TravMil, enrollment has focused on specific high-risk deployments to geographic regions of interest to both the DoD Global Emerging Infections Surveillance network and Combatant Commands, and infectious disease threat assessment findings are provided back to the enrolled units with recommendations to medical personnel on the optimal use of mitigation strategies. Clinical trials conducted or being developed are the first to examine high dose rifaximin as TD prophylaxis (Prevent TD), low dose rifaximin for TD treatment (TrEAT TD 2.0), and efficacy of multiple nutraceutical products in a single study (P4). Furthermore, the value of filter paper-based stool collection combined with TaqMan® Array Card polymerase chain reaction (PCR)-based assay as an alternative field-expedient approach (or supplemental to conventional methods) for diarrhea specimen collection in an austere environment with limited storage and laboratory capabilities was confirmed using stool specimens collected from different protocols within the research area. Moving forward, successful partnerships with DoD research laboratories, both within and outside of the United States, and with U.K. MOD will continue to be leveraged to perform specific high-priority surveillance efforts and utilize findings of clinical trials to improve the practice of deployment and travel medicine within the MHS.

HIGHLIGHTS/KEY FINDINGS

- **In the Prevent TD trial, the overall TD incidence in the population was low (~12% of the subjects) with varying rates between the U.S. and U.K. service members.**
- **In the P4 trial, the efficacy of Bimuno®, Florastor®, and Travelan® vs. placebo will be evaluated for the prevention of gut health disruption, focusing on a 10-day window of prophylaxis during travel.**
- **A KAPOS study of malaria chemoprophylaxis within the MHS and the network of civilian healthcare providers demonstrated that prescribing patterns vary with mefloquine being more commonly prescribed at civilian centers and more doxycycline prescribed to active-duty service members compared to beneficiaries.**
- **Risk factors for ILI, including choice of malaria chemoprophylaxis, were examined using TravMil data. A decreased likelihood of ILI was associated with doxycycline malaria chemoprophylaxis (risk ratio: 0.65; 95% confidence interval: 0.43-0.99) and military travel, while there was increased risk with female gender, travel to Asia, and cruise travel.**

HUMAN IMMUNODEFICIENCY VIRUS (HIV)

The Military Health System (MHS) began testing military recruits and screening active-duty personnel for HIV in 1985 with >10,000 service members testing positive for HIV during the past 35 years. With the success of early diagnosis and combination antiretroviral therapy (cART), the greatest long-term threats to this population are non-AIDS complications, including neurocognitive disorders, cancer, and cardiovascular disease, which are more common, even in successfully treated HIV patients. The overall mission of the HIV Research Area is to advance HIV care and treatment to maintain the health, function, and readiness of HIV+ active-duty service members and DoD beneficiaries.

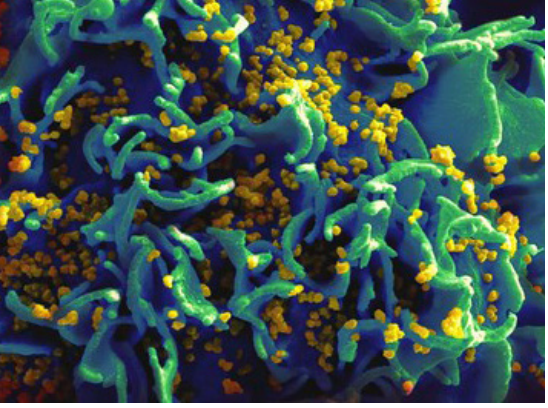
Brian Agan, MD, Deputy Science Director and HIV Research Area Director

With a high proportion of HIV+ service members and DoD beneficiaries in the MHS on cART and achieving viral suppression, the incidence of acquired immunodeficiency syndrome (AIDS) and HIV-related death have significantly decreased to become rare events. Thus, a focus of research is now on preventing and treating non-AIDS complications, sexually-transmitted infections (STIs), and mental health diagnoses, which are associated with potentially severe health consequences among HIV+ individuals. The overarching vision of the HIV Research Area is to inform military HIV policy and clinical practice guidelines and improve the long-term health, function, and readiness of HIV+ active-duty service members, benefiting not only DoD beneficiaries, but also civilian populations.

The U.S. Military HIV Natural History Study (NHS) is the cornerstone of the research area with >6,400 HIV+ active-duty service members and DoD beneficiaries enrolled. Led by Dr. Brian Agan, data collected through HIV NHS have been used to assess highly morbid non-AIDS complications (despite successful ART), as well as the incidence of co-infections. In response to an elevated rate of shingles identified among those with HIV and increasing rate among younger HIV-negative individuals, a randomized-controlled trial to evaluate the safety and immunogenicity of the Shingrix® vaccine in both HIV-negative and HIV+ individuals is in development. Due to the COVID-19 pandemic, HIV NHS enrollment and follow-up was paused in 2020. Virtual telehealth options for follow-up reengagement in 2021 are being considered.

The United Nations Joint Program on HIV/AIDS (UNAIDS) has advocated the 90-90-90 approach to end the worldwide AIDS epidemic by setting the following targets for 2020: 90% of HIV+ individuals diagnosed; 90% of diagnosed HIV+ individual receiving cART; and 90% of those on cART achieving viral suppression. With mandatory, routine screening of recruits and active-duty personnel for HIV resulting in early diagnosis and initiation of care, the cascade of care framework (diagnosis, ART adherence, and viral suppression), as well as the performance of the DoD toward the 90-90-90 targets, were examined in HIV+ NHS subjects. With 99% of subjects diagnosed between 2010-2015 linked to care within 60 days, 99% initiating cART, and 90% achieving viral suppression, DoD well-exceeded UNAIDS targets.

Service members who are HIV+ are predominantly assigned to limited duty status due to concerns regarding HIV-associated neurocognitive disorder (HAND), which is one of the most common non-AIDS comorbidities among those in the military who are HIV+. As the diagnosis of HAND improves, there is the potential of changes to current military policy, which may allow HIV+ active-duty service members to gain a greater range of job functions. Presently, the functional consequences of HAND in a high-demand setting



Scanning electromicrograph of an HIV-infected H9 T-cell (Image credit: NIAID)

The HIV Natural History Study team at Brooke Army Medical Center

Dr. Agan attending the Virtual 2020 CROI conference

is being assessed through the HIV Associated Neurocognitive Disorders (ALLHANDS) protocol, led by Dr. Agan. During the past year, the ALLHANDS protocol developed a joint dataset with the National Institute of Neurological Disorders and Stroke and the National Institute of Mental Health. Using this joint DoD-NIH dataset, analyses are underway to examine separate HAND phenotypes (e.g., neurodegeneration, neuroinflammatory, and vascular) and further evaluate the pathogenesis of HAND with the objective of improving preventive and therapeutic approaches. Although enrollment and follow-up for ALLHANDS was paused in 2020 due to COVID-19, a phased approach for follow-up reengagement is planned for 2021.

Through the DoD HIV Virtual Cohort Study (VCS), data were obtained from the MHS Data Repository to evaluate the association between HIV and non-AIDS complications with the goal of identifying early, and potentially modifiable, predictors. For the Strategic Timing of Anti-Retroviral Therapy (START) protocol, long-term follow-up through electronic medical record review is ongoing. In 2020, follow-up was completed for the CD4 Zeta protocol, which is led by COL (Ret.) Naomi Aronson, and data analysis to assess the HIV reservoir and persistence of gene therapy modified cells is underway.

In 2021, through a USU Health Services Research Program grant, quality, cost, and utilization of DoD HIV healthcare among service members will be examined, including evaluation of the impact of performance measures and differences in HIV policies between Services. Additional collaboration with the Department of Veterans Affairs (VA) is also being pursued, which would provide improved understanding of predictors of long-term HIV-related outcomes, allowing for the possibility of prospective early interventional trials aimed at preventing or minimizing long-term HIV-related outcomes relevant to both the DoD and VA.

MILITARY IMPACT

The HIV Research Area provides valuable information to the MHS through assessment of the continuum of HIV care in the DoD and evaluation of adverse HIV outcomes, including HAND. Through a DoD HIV Quality of Care Interest Group comprised of IDCRP investigators and Service Leaders for HIV, the cascade of care among DoD HIV+ active-duty and NHS subjects has been evaluated. In response to the Congressional National Defense Authorization Act of 2017, IDCRP investigators were integral for the Defense Health Agency development of the active-duty HIV viral suppression measure (available on CarePoint). Ongoing analyses include examination of the impact of mild and asymptomatic forms of HAND on functional performance, as well as the occurrence of STIs and other co-infections among HIV+ subjects and associated risks, including behaviors. Data generated through these analyses may inform policy decisions related to duty status of HIV+ service members, along with improved approaches for the prevention, diagnosis, and treatment of STIs in this population.

HIGHLIGHTS/KEY FINDINGS

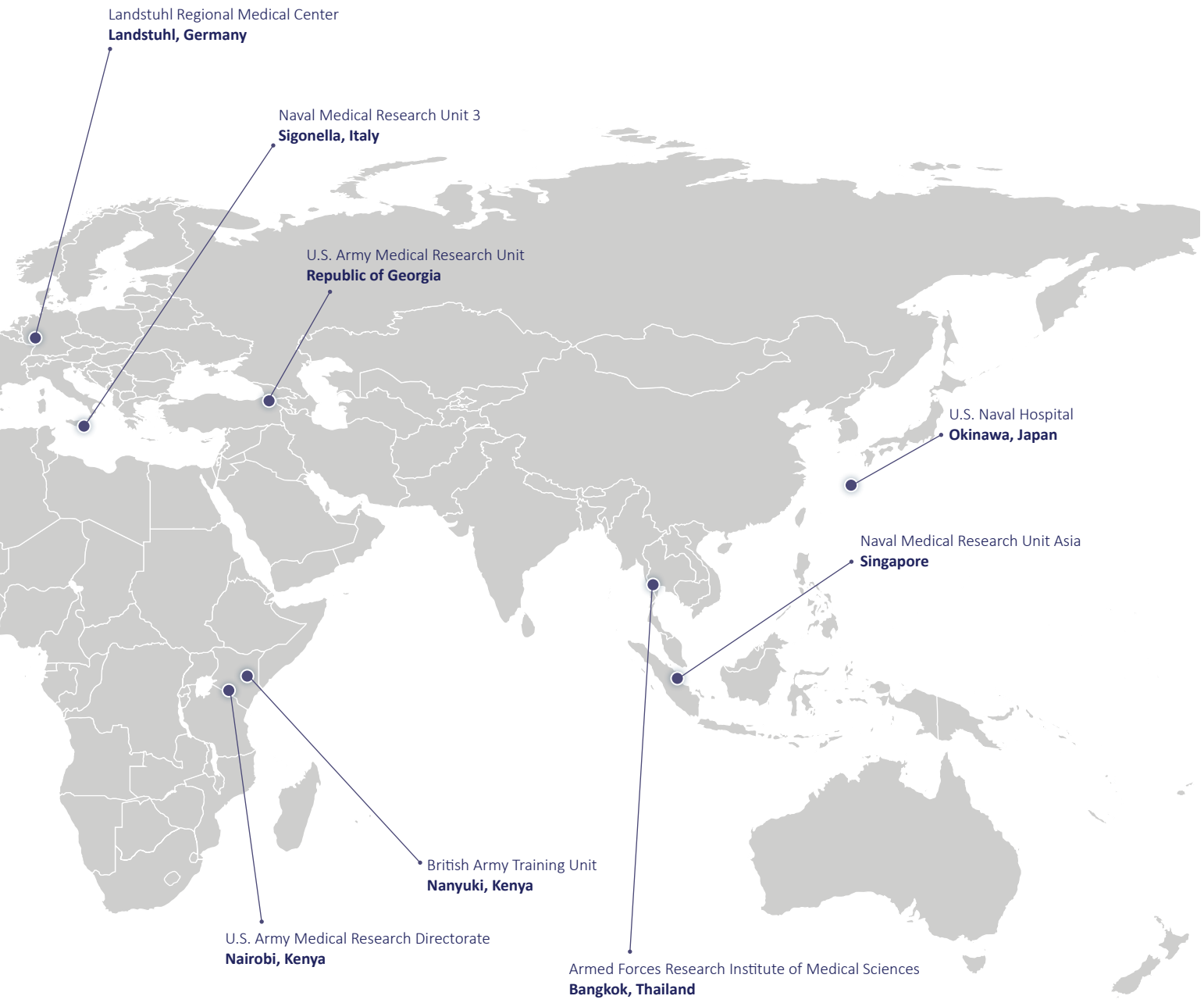
- **Low CD4 count and medical/mental comorbidities significantly affected health-related quality of life (based on physical / mental component scores from SF-36 surveys) for HIV+ individuals. No treatment-related differences were observed between non-protease and protease inhibitor-based ART.**
- **The HIV NHS was 1 of 3 clinical cohorts utilized to assess immune non-response among HIV+ individuals despite ART. While starting/final CD4 counts and CD4/CD8 ratios differed, the mean CD4 slope remained the same in each of the 3 cohorts, indicating a common CD4 response pattern among HIV+ subjects. A CD4 slope of ≥100 cells/µL/year was found to be predictive of improved clinical outcomes and suggests that a lower CD4 slope (<100) may warrant additional monitoring for adverse effects.**
- **Among 1,405 HIV+ subjects in the HIV NHS study, 99% were linked to care within 60 days of diagnosis. Proportion of viral suppression within 3 years of diagnosis improved from 64% among those diagnosed between 2003-2009 to 90% among subjects diagnosed between 2010-2015.**

IDCRP PARTNER NETWORK

36
PARTNER SITES

170+
EMPLOYEES

50+
ACTIVE PROTOCOLS



SEXUALLY-TRANSMITTED INFECTIONS (STI)

With increasing numbers of cases of sexually-transmitted infections (STIs) in the Military Health System (MHS), there is a crucial need for effective prevention, screening, and treatment to decrease the burden imposed by STIs on Force Health Protection and medical readiness.

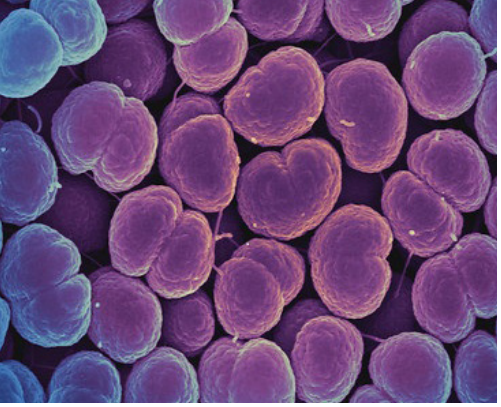
COL Eric Garges, MD, STI Research Area Director

In response to the ongoing epidemic of STIs in the United States, emergence of multidrug-resistant *Neisseria gonorrhoeae* (gonococcus, GC), and high levels of antimicrobial resistance of *Mycoplasma genitalium*, the aims of STI Research Area are to evaluate high-risk sexually-transmitted pathogens, support the development of biomedical countermeasures against STIs in military populations, and evaluate novel treatment strategies among active-duty personnel to support policy decisions and improved practice patterns.

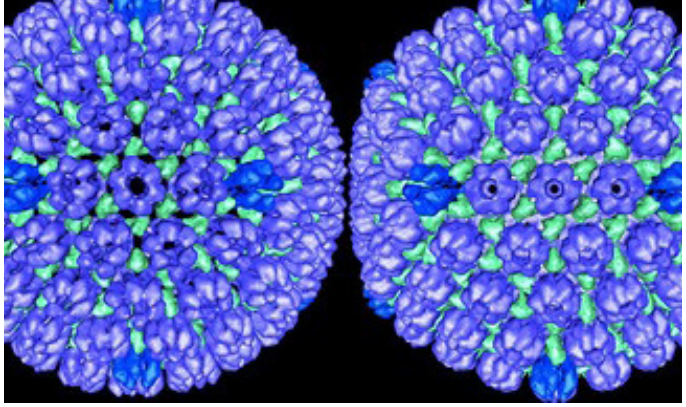
The STI Antimicrobial Resistance (AMR) Study (previously known as the GC Resistance Study), led by COL Eric Garges, and the DoD GC Reference Laboratory and Repository (coordinated by the IDCRP and led by Dr. Ann Jerse) is the cornerstone of the STI Research Area with >900 subjects enrolled. Identification of network clustering of GC isolates, potentially including classification of isolates from remote non-DoD sites, is underway in collaboration with informaticists at the Walter Reed Army Institute of Research Multidrug-Resistant Organism Repository and Surveillance Network. During the past year, the focus of the study was expanded to include comprehensive surveillance of bacterial STIs (e.g., genital mycoplasma and chlamydia), as well as GC. Due to the COVID-19 pandemic, enrollment at the study sites was put on hold and laboratory shutdowns resulted in specimen processing delays (reengagement planned for 2021).

For the Survey of Social Networks and STI Risk study, >700 participants were enrolled and a comprehensive partnership inventory of more than 900 sexual partnerships, including risk factor variables, was collected. Analysis on sexual mixing patterns, concurrency, and bridging is underway.

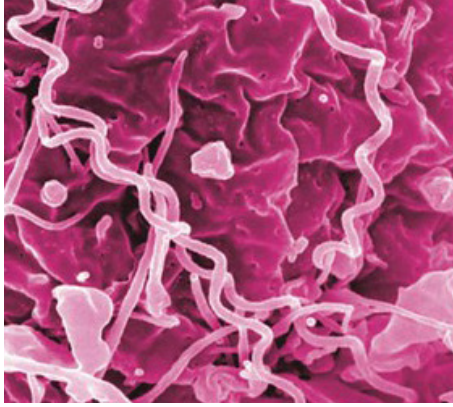
Funded through the Defense Health Agency Immunization Healthcare Division, the Bexsero® Serostudy (led by COL Garges) will leverage specimens from service members immunized with the OMV meningitis B vaccine (Bexsero®) in the DoD Serum Repository to evaluate the immune response against GC *in vitro*. While laboratory work has been delayed due to COVID-19, the analysis is expected to be completed in 2021. These findings will lay the groundwork for a Phase II randomized, placebo-controlled, observer-blinded clinical trial to assess the efficacy of the Mengococcal (Bexsero®) vaccine against gonorrhea infection (MAGI Trial). The protocol for the MAGI Trial has been developed in collaboration with the National Institute of Allergy and Infectious Diseases (NIAID), University of Alabama at Birmingham, and GlaxoSmithKline plc. The trial is expected to begin in 2021 and will include four sites in the United States, including Walter Reed National Military Medical Center, as well as two DoD-associated sites in Thailand. After vaccination, subjects will be followed for a period of 12 months with the primary endpoint being anogenital gonococcal or chlamydia infection with a secondary endpoint of pharyngeal gonococcal infection. The trial is sponsored by NIAID Division of Microbiology and Infectious Diseases.



Colorized scanning electron micrograph of Neisseria gonorrhoeae [Credit: NIAID]



Herpes Simplex Virus Type 1, procapsid (left) and mature capsid (right) [Credit: Dr. Heymann, NIH]



Micrograph of Treponema pallidum, bacteria that causes syphilis [Credit: NIAID]

In 2021, the STI AMR Study will evaluate antimicrobial resistance, infection persistence, and patient-derived clinical outcomes for bacterial STIs, providing new opportunities for partnerships with academia. In addition, we will assess opportunities to use the well-established STI surveillance network for evaluation of STI biomedical countermeasures.

MILITARY IMPACT

The overall goal of the STI Research Area is to support the prevention, diagnosis, and treatment of STIs to eliminate STI transmission among active-duty members and beneficiaries and improve Force Health Protection. Findings from the STI AMR Study provide up-to-date information on the geographic distribution of isolates connected to antimicrobial susceptibility patterns, which are used for operational planning by the DoD. Susceptibility testing and advanced molecular characterization of isolates collected from the United States and overseas are assessed through the DoD GC Resistance Laboratory and Repository. Epidemiologic data on increasing azithromycin resistance among GC isolates in the Western United States is provided to Combatant Commands through the Global Emerging Infections Surveillance Data to Decision Initiative for situational awareness and response, as needed. Engagement with partner militaries for GC surveillance remains active in Ghana, Thailand, Peru, and the Republic of Georgia, providing valuable local Force Health Protection data and supporting improvements in the technical capability and laboratory methods for host nation partners.

HIGHLIGHTS/KEY FINDINGS

- **The Defense Health Agency Immunization Healthcare Division-funded serostudy demonstrates that antibodies from Bexsero® immunized service members recognize select antigens on gonococcal outer membrane vesicles, which could be targets for GC vaccine optimization for future use by the DoD.**
- **The NIAID-sponsored Phase II clinical trial to assess efficacy of meningococcal Group B vaccine rMenB+OMV NZ (Bexsero®) in the prevention of gonococcal infection (MAGI Trial) will involve four sites in the United States: Walter Reed National Military Medical Center, University of Alabama at Birmingham, Emory University, and Louisiana State University. Two DoD-associated sites in Thailand will also be involved in the trial. Enrollment is expected to begin in 2021 and will focus on individuals at high risk of GC between the ages of 18 through 39 years.**
- **In collaboration with the Walter Reed Army Institute of Research Military HIV Research Program and Armed Forces Research Institute of Medical Sciences, a mucosal immunology substudy for the MAGI Trial to evaluate possible correlates of protection against gonococcal infection will be conducted.**
- **A post-hoc analysis of STI risk factors and associated health behaviors identified from the 2015 DoD Survey of Health-Related Behaviors is underway and findings will inform future high-impact observational study or clinical trials.**

WOUND INFECTIONS

Wound infections impose significant health, financial, and operational burdens on the military during wartime. These infections also impact peacetime operations, primarily during initial military training, where there is high risk of developing community-associated skin and soft-tissue infections (SSTIs). Increasing threat of multidrug-resistant pathogens, coupled with emergence of novel microbial threats, further complicates the challenging management and prevention of these infections.

Eugene Millar, PhD, Wound Infections Research Area Director

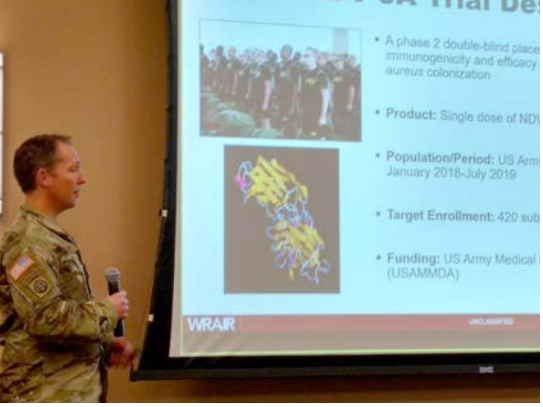
Katrin Mende, PhD, Wound Infections Research Area Deputy Director

In early January 2020, the Trauma-Related Infections and SSTI Research Areas merged to form the Wound Infections Research Area with the overall goal to reduce the short- and long-term impact of wound infections among military personnel through improved evidence-based clinical practice guidance and determination of effective strategies for treatment and prevention.

With regard to battlefield injuries, a central protocol of the research area is the Trauma Infectious Disease Outcomes Study (TIDOS). Led by Dr. David Tribble, TIDOS systematically amassed detailed information related to infectious complications, medical and surgical management, and microbiology from military personnel wounded during deployment over a 5.5-year period (2009-2014). Data on trauma-related infections diagnosed after the initial hospitalization period were also collected from subjects enrolled in the TIDOS longitudinal cohort through DoD and Veterans Affairs (VA) follow-up. In a collaborative analysis with the VA St. Louis Health Care System (led by Dr. Jay McDonald), examination of physical and social health factor survey responses collected from TIDOS enrollees is nearing finalization.

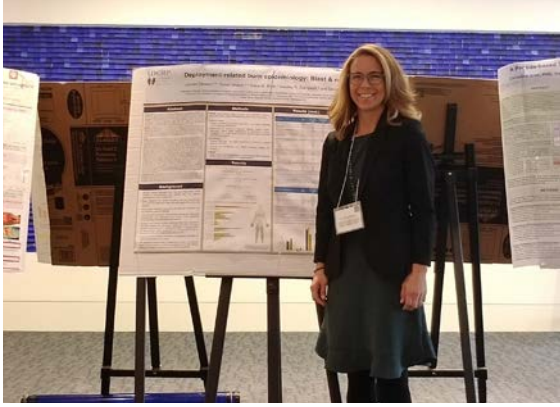
Due to the high prevalence of blast injuries, polytrauma is common among combat casualties with extremity/orthopedic wounds being most frequent. Led by Dr. Laveta Stewart, evaluation of the effectiveness of vancomycin regimens for the treatment of deep soft-tissue infections is nearing completion. In conjuncture with a comprehensive literature review, these findings will support development of recommendations for treatment of combat-related extremity wound infections. Invasive fungal wound infections (IFI) are another serious complication following severe blast trauma, resulting in substantial morbidity and mortality. As early diagnosis is crucial for successful management of IFIs, a panfungal polymerase chain reaction (PCR)-based assay to identify filamentous fungi in archived tissue specimens was previously evaluated by the TIDOS team, led by Dr. Anuradha Ganesan. During 2020, performance of semi-nested PCR-based assays targeted toward clinically relevant fungi were assessed. These findings are being examined to identify best diagnostic methods to support use of PCR-based assays in future conflicts.

As community-associated SSTIs, primarily attributed to *Staphylococcus aureus*, levy considerable healthcare and operational burdens, identification of effectual preventive approaches is crucial. Led by COL Jason Bennett (WRAIR), the IDCRP conducted a Phase 2 trial from 2018-2019 at Fort Benning, GA, to evaluate the safety, immunogenicity, and efficacy of a *S. aureus* vaccine candidate (NDV-3A; NovaDigm Therapeutics, Inc.) against nasal acquisition of *S. aureus* among U.S. Army Infantry trainees. This trial represents the first ever evaluation of a *S. aureus* vaccine candidate in a military training population, a group known to be at increased risk for *S. aureus* colonization and SSTI. The successful enrollment and follow-up of nearly 400 trainees demonstrated that a well-integrated,



COL Jason Bennett presenting at the Wound Infections Research Area Annual Investigator Meeting

11-12 March 2020



Dr. Laveta Stewart presenting at the DoD Blast Injury Research Program 2020 International State-of-the-Science Meeting

investigational product clinical trial could occur in the highly structured and regimented military training setting.

Over the past decade, epidemiological studies of *S. aureus* SSTIs conducted at Fort Benning, led by Dr. Eugene Millar and COL Bennett, have established an extensive data and specimen repository. Analysis of these isolates has furthered understanding of the genomic characterization of both methicillin-resistant and methicillin-susceptible *S. aureus* isolates and provided data on transmission dynamics and intra- and interhost relatedness between colonization and infection. In collaboration with USU Department of Microbiology, isolates collected through the SSTI Cohort Study are being leveraged to examine the human microbiome among trainees with and without *S. aureus* SSTIs, as well as assess microbiome changes among individuals in congregate settings. A recently completed analysis, in collaboration with the Johns Hopkins Applied Physics Laboratory, examined the impact of mass prophylaxis against Group A Streptococcal disease (i.e., Bicillin [penicillin G]) on the longitudinal microbiome of military trainees.

Through a collaborative effort across multiple DoD laboratories, the TIDOS Multidrug-Resistant and Virulent Organisms (MDR/VO) Trauma Infections Initiative (led by Dr. Katrin Mende) conducts research to maximize the understanding of complex polymicrobial wounds using isolates and clinical data collected from wounded personnel. Ongoing analyses are evaluating the interaction of common wound bacteria (e.g., ESKAPE pathogens) and clinical outcomes in relation to microbiology. The comprehensive characterization of *Enterobacter cloacae* isolates recovered from combat casualties is presently underway.

In 2021, machine learning will be utilized to support development of clinical decision support tools to aid in risk stratification of combat casualties with regard to likelihood of developing high-consequence infections. Evaluation of the healthcare burden of combat casualties who develop MDR Gram-negative infections is another new initiative underway. Furthermore, antigen discovery will be utilized to identify novel *S. aureus* vaccine targets and advancements for SSTI prevention will be surveyed as potential candidates for clinical trials.

MILITARY IMPACT

The aims and objectives of the Wound Infections Research Area are responsive to priorities of the DoD Joint Trauma System and MHS. Analyses of battlefield wound infections provide essential information during inter-war periods to improve understanding and best practices for infection prevention and management in future conflicts. Risk stratification of combat casualties with regard to infection development will be crucial in the setting of prolonged field care. The comprehensive examination of community-associated SSTI epidemiology and assessment of strategies to prevent SSTIs in high-risk military populations, including trainees, have decreased the burden on the MHS and improved operational readiness. Overall, the strengths and opportunities of this research area present a robust platform to support development and refinement of evidence-based clinical practice guidelines for management of militarily-relevant wound infections.

HIGHLIGHTS/KEY FINDINGS

- **As part of the Phase 2 *S. aureus* NDV-3A vaccine trial at Fort Benning, 382 U.S. Army Infantry trainees were vaccinated (352 completed follow-up). Although the vaccine was highly immunogenic, there was no impact on *S. aureus* carriage.**
- **Among 314 wounded military personnel who had ≥1 combat-related exploratory laparotomy (58% occurring within the combat zone), 14% developed an abdominal surgical site infection, primarily organ space infections.**
- **>7,400 patients in the MHS were diagnosed with a bloodstream infection over a five-year period. *Escherichia coli* and *S. aureus* were the most common pathogens associated with the infections.**
- **Through a grant from the USU Health Services Research Program, inpatient healthcare utilization and cost for patients with MDR Gram-negative infections is being assessed to support improved military health practice and policy decisions in preparation for future conflicts.**

THE IDCRP STAFF

The numerous clinical research accomplishments and successes attained by the IDCRP can be directly attributed to its highly skilled employees, who exhibit a tremendous perseverance, dedication, and enthusiasm to advancing clinical infectious disease research and improving the health of military service members.

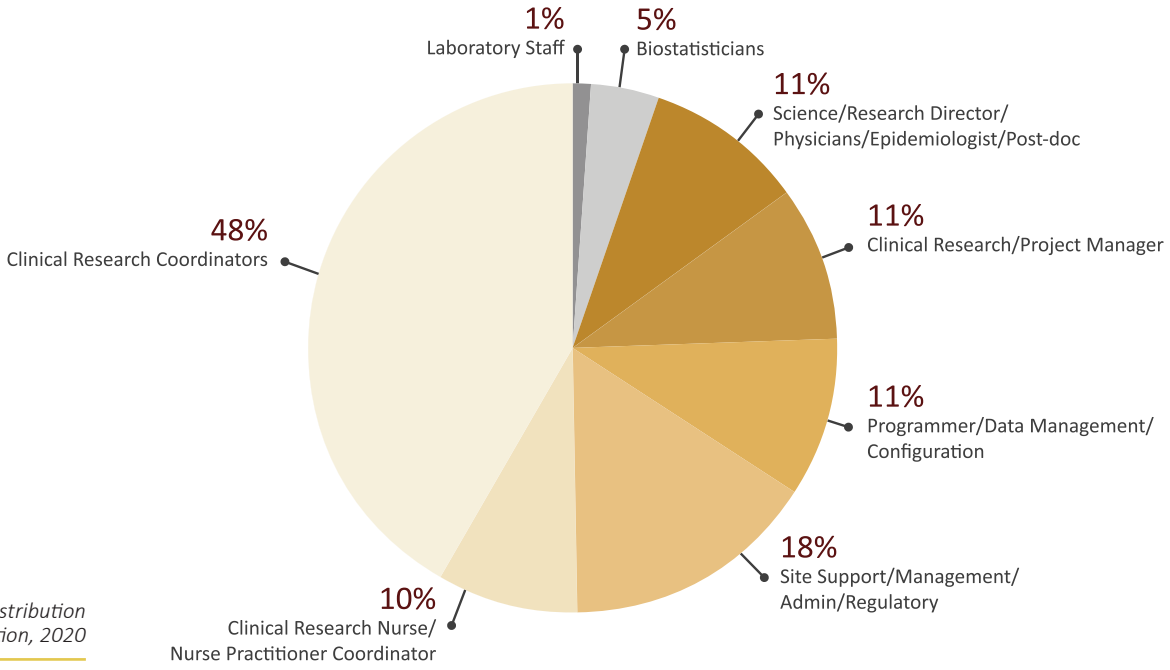
In 2020, more than 170 research and program-support personnel were employed by the IDCRP. These outstanding individuals consistently rise to the occasion of supporting the varied clinical portfolio of the Program, which ranges from retrospective observational studies to prospective clinical trials. Furthermore, our employees continue to demonstrate superb diligence in the face of new challenges brought forth by the COVID-19 pandemic.

A high percentage of our personnel directly interact with research study subjects at clinical sites within the military hospital/clinic network. As depicted in the figure, clinical research coordinators and clinical research nurse (or nurse practitioner) coordinators account for the bulk of these professionals. The IDCRP staff also includes clinical investigators based at military clinical sites and USU and protocol-support personnel (e.g., clinical research and site managers), program and data managers, programmers, regulatory affairs specialists, laboratory staff, and biostatisticians.

Our staff members are located at DoD military treatment facilities, USU, and operational clinics within the United States and at locations overseas.

The wide-ranging expertise of members of the IDCRP staff includes infectious diseases, preventive medicine, public health, epidemiology, microbiology, data management/programming, statistical analysis, program management and finances, and regulatory affairs. Approximately half of our personnel have received at least two degrees and it is the considerable experience and knowledge of everyone on the IDCRP team that have contributed to the ongoing success of the Program.

We wish to thank our employees for their continued distinction and hard work to support the IDCRP, particularly during the challenges of this past year with the COVID-19 pandemic.



IDCRP Personnel Distribution by Occupation, 2020

DATA COORDINATION CENTER

As the core of IDCRP research efforts, the Data Coordination Center (DCC) provides high-quality, integrated, and effectual data collection, processing, management, and access.

The DCC, led by Mr. Edward Parmelee (DCC Chief), includes a highly efficient team of data system designers, data managers, data entry staff, and SAS / Oracle programmers. For all studies where the IDCRP is the main data collector or repository, the DCC team provides critical resources and expertise to support research through all stages of data processing, including conceptualization, design, collection, management, cleaning, analysis, and publication. During 2020, 38 IDCRP studies were supported by the DCC, of which 4 studies exclusively used data obtained from the Military Health System (MHS) Data Repository.

Beginning in mid-February, the majority of DCC resources were prioritized to focus on developing studies related to COVID-19 research. In the months that followed, the DCC designed, created, tested, and implemented data entry operations for five COVID-19 research studies, of which four were newly developed and one was an existing protocol requiring modification to pivot to analysis of SARS-CoV-2. With the implementation of health and safety protocols, subjects included in the studies were generally not in the same physical location as the study staff. To facilitate this approach, the DCC utilized its remote data capture capabilities through REDCap, which is a browser-based electronic data capture system and workflow methodology for the design and execution of clinical research databases. In particular, the rapid development and implementation of REDCap data collection workflow for the study involving the USNS Comfort allowed it to be ready for data entry once the Naval Hospital ship was docked at Naval Medical Center Portsmouth.

Although a portion of the existing IDCRP portfolio studies were suspended in response to the COVID-19 pandemic, studies in each of the research areas remained active with the DCC providing support. As one example, DCC heavily supported another large-scale study, the Pragmatic Assessment of Influenza Vaccine Effectiveness in the DoD (PAIVED) study through the creation of case report forms, completion of programming and testing of the electronic data capture system, deployment of the system to the sites, and collection of data.

In the upcoming year, the DCC will continue to support COVID-19 research studies, both ongoing and newly developed. In addition, the DCC expects to design, create, and implement the migration of additional ongoing studies from their legacy systems that are being phased out into the REDCap system. Furthermore, the creation of a new subject registry system for the HIV Natural History Study is planned to allow direct interaction by site staff.

Edward Parmelee, MS
Chief, Data Coordination Center

HIGHLIGHTS

- **To support the multiple studies utilizing data from the MHS Data Repository, a full-time data manager dedicated to abstraction of data from the repository was hired.**
- **Data collection workflows were developed and implemented in REDCap for seven studies, allowing DCC to meet the challenges of conducting research under the safety precautions implemented in response to the COVID-19 pandemic.**
- **The DCC supported the development and initiation of four COVID-19 studies and the reconfiguration of the EPICC study to support COVID-19 data collection. As the science has advanced, the studies continue to evolve, with DCC being highly responsive and efficiently modifying the data collection fields, as needed.**

PROGRAM OPERATIONS & FINANCE

The successful execution of high-quality IDCRP clinical research is dependent not only on the clinical investigative and management teams, but also requires the Program to have a strong operational and financial foundation.

Samuel Davis, PhD, Chief, Program Operations and Finance

The Program Management and Finance (PM&F) team is led by Dr. Samuel Davis, Chief of Program Operations and Finance. During the past year, the PM&F team responded to the intensified operational burden needed to conduct clinical research during a pandemic by maintaining a high level of readiness. Through their efforts, increased personnel, financial, and other resources were quickly provided to military treatment facilities within the IDCRP Partner Network for newly launched COVID-19 clinical research studies.

In particular, the PM&F team managed the evolution of the IDCRP clinical research portfolio as a new research area was established to focus on the COVID-19 pandemic. This included the processing of funding awards from the Defense Health Program to support the clinical research, activation of new sites, and personnel recruiting.

Although there was a substantial effort required for the management of the new COVID-19 Research Area in 2020, resource management for the other five research areas continued with a high degree of efficiency. The PM&F team processed multiple new funding awards, supported grant proposal development, and produced multifaceted financial analyses to enhance current resource management within the Program.

Despite the COVID-19 pandemic, the PM&F team continued to maintain and fortify communication with stakeholders through use of virtual meetings with representatives from both USU and HJF finance and program management teams to discuss the status of forthcoming funding awards. The Master External Funds Report remained a crucial component of these discussions, providing meeting attendees with up-to-date information on the incoming awards, including details related to the expected timing of award receipt at USU.

As an integral part of program operations, the Research Support Group (RSG) delivers vital administrative support for IDCRP leadership and research area clinical and management teams. During the past year, the RSG team submitted and tracked clearance requests for deliverables, managed supply orders for clinical sites, and supported the Wound Infections Research Area Annual Investigator Meeting. In addition, the RSG team oversaw the move of the IDCRP main offices to our new location at the HJF Headquarters in Bethesda.

In the upcoming year, the PM&F and RSG teams will continue to work to improve efficiency to further support the Program. In addition, the development of new financial planning and resource-management tools are planned to further enhance budget building, management, and analysis.

HIGHLIGHTS

- **The PM&F team tracked, processed, and managed nine separate funding awards received by the IDCRP in 2020.**
- **The IDCRP saw a surge in personnel numbers with >70 new job openings (majority filled), largely the result of new positions developed for COVID-19 research studies.**
- **RSG team members supported the Wound Infections Research Area Annual Investigator Meeting (held in early March 2020), which had to rapidly shift to a virtual platform as several speakers were unable to travel due to the growing pandemic.**

QUALITY MANAGEMENT & CLINICAL RESEARCH OPERATIONS

The vast clinical research portfolio of the IDCRP is overseen by the Clinical Research Operations team. A core component for the successful execution of these studies is well-integrated quality assurance and management.

Program-wide, centralized quality management of the IDCRP clinical research portfolio is integral to ensure regulatory compliance, data quality, and consistency. Led by Ms. Christina Fox, Chief, the Quality Management Program was established to provide expertise and guidance to investigators and study team members on implementing quality management measures for multisite clinical studies and improving the standardization of practices and reporting across clinical sites.

During the past year, the Quality Management Program continued to advance toward its goals through development of new Standard Operating Procedures (SOPs) and guidance documents, as well as with the initiation of the IDCRP Internal Program Review, resulting in improvements in regulatory affairs processes and subsequent faster approval times for many clinical sites within the IDCRP Partner Network. Due to the COVID-19 pandemic, the completion of the IDCRP Internal Review was postponed; however, documentation that was already established through the review was utilized to rapidly develop and execute multiple new clinical studies within the COVID-19 Research Area.

The COVID-19 pandemic resulted in an increased demand for Program-level support, including rapid regulatory reviews, development of new study materials, and quick initiation of clinical sites for the protocols. Creative solutions were also necessary to effectively conduct multisite clinical research amidst social distancing and other infection control guidelines, such as use of remote study visits and new consenting practices (e.g., verbal, electronic, and in isolation).

The effective execution of the IDCRP clinical research portfolio can be attributed to the combined efforts of the USU-based IDCRP team of Clinical Research Managers, military treatment facility (MTF)-based Site Managers, and MTF lead Clinical Research Coordinators who actively support Principal Investigators, the Data Coordination Center, and protocol teams with both the development of protocols and execution of the studies. Significant achievements in 2020 include the well-coordinated and successful enrollments for the Acute Respiratory Infections Research Area PAIVED trial, as well as the rapid development and execution of the COVID-19 Research Area EPICC study and ACTT trials.

In 2021, Ms. Fox will continue to identify and prioritize quality management needs to improve the overall efficiency of the IDCRP. A primary objective for the upcoming year is the creation of a Quality Assurance Manual to improve standardization across the IDCRP in accordance with Good Clinical Practice and other applicable DoD regulations.

Christina Fox, CCRC, CCRP, Chief, Quality Management

HIGHLIGHTS

- **An IDCRP Internal Program Review was initiated with the goal of identifying and understanding areas for improvement through review of current documentation on protocol processes, tasks, and responsibilities. Based on the findings of the internal review, new SOPs and guidance documents will be generated to standardize IDCRP processes.**
- **In collaboration with the Regulatory Affairs and clinical study teams, new documentation related to clinical study protocols was developed in 2020 to improve efficiency, clarify processes, and improve regulatory approval pathways. These include the New Site Operations Handbook, Clinicaltrials.gov guidance, and Regulatory Affairs Approval Tracker for DoD Multisite Studies.**

SCIENTIFIC REVIEW BOARD

The mission of IDCRP Scientific Review Board (SRB) is to perform efficient and comprehensive independent scientific reviews of clinical research protocols, as well as protocol amendments, prior to being submitted to the USU Institutional Review Board (IRB).

John Powers, MD, Chair, Scientific Review Board

Meticulous scientific reviews by the SRB are conducted to ensure that research questions, hypotheses, aims/objectives, and methods included within the submitted protocols and protocol amendments are feasible, as well as being scientifically meaningful. Chaired by Dr. John Powers (National Institute of Allergy and Infectious Diseases liaison) and Vice Chair CDR Mark Simons, the SRB reviews every new protocol brought forth by the IDCRP, including those involving subjects already engaged in IRB-approved protocols, with the goal of enhancing the scientific quality of the contents prior to submission to the USU IRB.

The SRB panels include subject-matter experts, biomedical scientists, statisticians, and other scientific review panel members affiliated with IDCRP research networks (as appropriate), with the composition of each panel dependent on the topic of the protocol submitted for review. Efficiency of the SRB process is upheld through use of three distinct review pathways with the level of review required for each submission determined by the SRB Chair (or Vice Chair when the Chair is recused or unavailable). A standard review is generally completed within 35-45 days, while a Low Resource review and a Chair review typically take 28 days and 14 days, respectively. In response to the public health urgency associated with the COVID-19 pandemic, Dr. Powers established an Expedited Review pathway for protocols related to COVID-19 research efforts, resulting in the completion of SRB reviews within 15 to 20 days.

During 2020, the SRB maintained productivity with review of nine new protocols, of which four were COVID-19 related, and eight protocol amendments. Furthermore, submission of additional new protocols is forthcoming. With regard to the Expedited Review process for the new COVID-19 protocols, SRB reviewers rapidly completed their preparation for the reviews within 3-5 days. The Expedited Review pathway was also aided by extensive discussions regarding study design prior to the protocol development. In addition, as reviews may not commence until the panels are formed, the SRB surveyed potential reviewers on their availability and willingness to serve on the panels prior to protocol submissions.

For 2021, the SRB Chair will continue to work to improve efficiency of the review process by encouraging Principal Investigators to submit names of potential reviewers in advance of submission, standardizing timelines for SRB submissions, mentoring junior investigators on protocol development and how to link research questions to study design, and training new reviewers on the review pathways. These efforts will further augment the SRB process, while maintaining high-quality reviews of submissions.

SRB Reviews and Approvals	Numbers
Submission to the SRB	**17**
New protocols	9
Protocol amendments	8
SRB disposition	
Approved	15
Under Review	2

REGULATORY AFFAIRS

The IDCRP Regulatory Affairs team provides expertise and invaluable assistance to investigators during the preparation of new research protocols, as well as with the execution of ongoing protocols to ensure ethical and regulatory compliance.

Along with effectively supporting protocol development and execution, the IDCRP Regulatory Affairs team also prepares for regulatory monitoring and audit visits, and serves as the liaison between the IDCRP and regulatory officials at USU, the Defense Health Agency, Department of Defense (DoD) partners, the National Institute of Allergy and Infectious Diseases, other regulatory agencies (e.g., Food and Drug Administration), and collaborators. The IDCRP presently has more than 50 active (open) protocols at varying stages of development, including multiple new COVID-19 research study protocols developed in 2020.

Following recognition of the COVID-19 pandemic caused by the novel pathogen, SARS-CoV-2, many DoD Clinical Investigation Departments ceased processing non-essential study submissions to focus time and effort on submissions related to COVID-19 research. Infection control measures implemented at DoD clinical sites in response to the pandemic also resulted in several IDCRP research studies being placed on hold. Although these measures led to a reduction in the number of general pre-Institutional Review Board (IRB) reviews requested by IDCRP investigators, there was a corresponding increase in the need for rapid pre-IRB reviews and live submission training as multisite COVID-19 research studies were developed.

The ongoing success of the IDCRP can largely be attributed to numerous collaborations and partnerships with military, government, civilian, and academic research institutions and laboratories. For each of these collaborations and partnerships, diverse official agreements are required, including Cooperative Research and Development Agreements, Data Sharing Agreements, and Materiel Transfer Agreements. During 2020, Ms. Stephanie Cammarata, IDCRP Agreements Officer, managed a portfolio of 168 active agreements with 76 agreements prepared for either a new collaboration or an existing agreement renewal submitted for review. Thirty-one of the new agreements were related to COVID-19 research efforts.

One of the main goals of the past year was improving the efficiency of IDCRP regulatory review pathways. As such, Dr. Lev Nevo and Ms. Elisa Chapo, Program Regulatory Affairs Specialists, provided Ms. Christina Fox, the Quality Management Chief, with input and assistance for the development of Standard Operating Procedures (SOPs) and guidance documents for the Quality Management Program. For the upcoming year, Ms. Cammarata will implement process improvement plans related to the management of agreements, educate new hires, and conduct annual training of the Agreements SOP. In addition, the Regulatory Affairs team will focus on submitting eligible studies for expedited eIRB review under the revised Common Rule, work to reduce the number stipulations received per each eIRB submission, and assist the Quality Management Chief with continuing the development of the IDCRP Quality Management Program.

Lev Nevo, MD, Program Regulatory Affairs Specialist

Elisa Chapo, BS, Program Regulatory Affairs Specialist

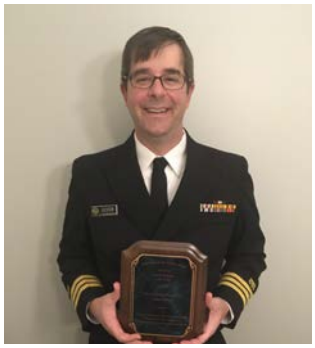
HIGHLIGHTS

- **IDCRP Regulatory Affairs team successfully conducted 125 pre-IRB reviews of documents, including initial protocol submissions, protocol modifications, reportable events, and closures. Forty-one of the pre-IRB reviews were for COVID-19 research studies with an average turnaround time of 1.86 days per submission.**
- **Six research studies and clinical trials under the COVID-19 Research Area were activated at multiple sites across the IDCRP Partner Network.**

EDUCATION / MENTORSHIP

Along with conducting high-quality clinical research, a priority objective of the IDCRP continues to be the cultivation of the next generation of infectious disease (ID) clinical researchers in the U.S. Armed Services through use of mentored research projects and research engagement.

CPT Joseph Bozzay presenting at the 15th Annual Academic Surgical Congress



CDR Dave Jackson with his CAPT Richard R. Hooper award for best presentation in clinical research

Mentored research projects developed and coordinated by IDCRP investigators are offered to medical and public health students, ID fellows, and residents in the U.S. Armed Services at USU and military treatment facilities within the IDCRP Partner Network. These partners include Brooke Army Medical Center, Fort Belvoir Community Hospital, Madigan Army Military Center, Naval Medical Center San Diego, and Walter Reed National Military Medical Center (WRNMMC). Research opportunities are available in all IDCRP research areas, including the new COVID-19 Research Area, and provide trainees with hands on, practical experience related to the design of research studies, collection of data and analysis, and publication/presentation of findings. In addition, IDCRP investigators are involved in the development of the clinical ID research capstone curriculum offered to medical students through the USU training program and provide support for continuing graduate medical education efforts at WRNMMC and the Armed Forces Infectious Disease Society (AFIDS) annual meetings.

During the past year, 42 residents (across multiple specialties, such as Internal Medicine, Ophthalmology, Preventive Medicine, and Surgery), medical students, and ID Fellows either began or finished their IDCRP-mentored research projects. In addition, three USU doctoral candidates, two USU MPH students, two USU post-doctoral trainees, and three HJF post-doctoral fellows are conducting or participating on IDCRP-mentored analyses. A post-doctoral fellow at the Harvard T. H. Chan School of Public Health also participated on an IDCRP study and data from an IDCRP analysis were utilized by a Postbaccalaureate for a National Institutes of Health Intramural Research Training Award study. Furthermore, 20 trainee clinicians, a post-doctoral epidemiologist, two Master's degree students, and a PhD graduate student are engaged in ongoing research through the COVID-19 Research Area. These IDCRP-mentored research projects resulted in 10 oral and poster presentations at local and national conferences and the publication (or acceptance for publication) of 9 manuscripts. During 2020, trainees who participated in IDCRP-mentored research projects also received award recognition at local research competitions (see IDCRP Awards and Honors, page 28).

Research engagement remains a crucial element toward increasing awareness of clinical ID opportunities in the U.S. Armed Services. As such, IDCRP investigators continued to present and publish findings of clinical relevance, as well as attend public health student practicum and project fairs (virtual in 2020), discuss research opportunities with medical students and ID Fellows, and engage in regular communication with the Directors of medical training programs about available IDCRP-mentored opportunities. Current and former mentored trainees, ID consultants, and USU faculty are also encouraged to meet with trainees to discuss the role of research in their work to further stimulate interest.

The IDCRP education mission continues to effectively support the growth of active-duty ID clinical researchers in the U.S. Armed Services.

Dr. Catherine Decker with her trainee, LCDR Sara Robinson

SELECT IDCRP TRAINEE EDUCATION PUBLICATIONS & PRESENTATIONS

PUBLICATIONS

Bozzay JD, Walker PF, Schechtman DW, Shaikh F, Stewart L, Tribble DR, Bradley MJ. Outcomes of Exploratory Laparotomy and Abdominal Infections among Combat Casualties. *Journal of Surgical Research*. 2021; 257(1): 285-293.

Patterson SB, Mende K, Li P, Lu D, Carson ML, Murray CK, Tribble DR, Blyth DM, and the IDCRP TIDOS Group. *Stenotrophomonas maltophilia* Infections: Clinical Characteristics in a Military Trauma Population. *Diagnostic Microbiology and Infectious Diseases*. 2020; 96(2): 114953.

Schall SE, Li P, Whitman TJ, Petfield JL, Tribble DR, Blyth DM. *Clostridioides difficile* Infection Complications among Combat-Injured Patients from Iraq and Afghanistan. *Infection Control and Hospital Epidemiology*. 2020; 41(9): 1100-1102.

Galaviz K, Varughese R, Agan BK, Marconi VC, Chu X, Won SH, Ganesan A, Ali MK, Colasanti J. The Intersection of HIV, Diabetes, and Race: Exploring Disparities in Diabetes Care among People Living with HIV. *Journal of International Association of Providers of AIDS Care*. 2020 Jan-Dec; 19:2325958220904241.

Emuren L, Welles S, Macalino G, Evans AA, Polansky M, Ganesan A, Columbo RE, Agan BK, and the Infectious Disease Clinical Research Program HIV Working Group. Predictors of Health-related Quality of Life among Military HIV-Infected Individuals. *Quality of Life Research*. 2020; 29(7): 1855-1869.

Schulte A, Agan BK, Wang HC, McGann PT, Davies BW, Legault GL, **Justin GA**. Multidrug-Resistant Organisms from Ophthalmic Cultures: Antibiotic Resistance and Visual Acuity. *Military Medicine*. 2020; 185(7-8): e1002-e1007.

Yabes JM, Stewart L, Shaikh F, Robben PM, Petfield JL, Ganesan A, Campbell WR, Tribble DR, Blyth DM. Risk of Acute Kidney Injury in Combat-Injured Patients Associated with Concomitant Vancomycin and Extended-spectrum Beta-lactam Antibiotic Use. *Journal of Intensive Care Medicine*. Accepted for publication.

PRESENTATIONS

15th Annual Academic Surgical Congress. 4-6 February 2020.

Bozzay JD, Walker PF, Schechtman DW, Shaikh F, Stewart L, Tribble DR, Bradley MJ. Outcomes of Exploratory Laparotomy and Abdominal Infections among Combat Casualties.

2020 International Neurophycological Society Annual Meeting, 5-8 February 2020.

Ham L, Smith B, Agan BK, Horne EF, Hsieh H, Chu X, Won SH, Mburu T, Segalà L, Kreisl WC, Nath A, Snow J. The Utility of the Medical Symptom Validity Test (MSVT) in People with HIV (PWH).

2020 World Ophthalmology Congress, 26-29 June 2020.

Grant J, Harvey M, Dear N, Esber A, Iroezindu M, Bahemana E, Kibuuka H, Owuoth J, Maswai J, Crowell TA, Polyak CS, Agan B, Ake J. Ophthalmic Disease in the AFRICOS HIV-Positive Cohort

American College of Physicians Annual Tri-Service Conference, 9-11 September 2020

Cooper E, Baker M, Ritter A, Baldino T, Lee M, Mcadoo T, Nguyen H, Warkentien TE, Lalani T, Millar E, Burgess T, Lee TK, Kronmann KC. Seroprevalence of Novel Coronavirus Antibodies among Personnel Deployed on the USNS COMFORT during the COVID-19 Pandemic.

2020 American College of Surgeons Clinical Congress. 4-8 October 2020.

Bozzay JD, Walker PF, Schechtman DW, Shaikh F, Stewart L, Tribble DR, Bradley MJ. Risk Factors for Abdominal Surgical Site Infection after Exploratory Laparotomy among Combat Casualties.

2020 IDSA ID Week. 21-25 October 2020.

Vostal AC, Grance M, Chukwuma U, Morales C, Lanteri C, Telu K, Parmelee E, Powers JH III, Mende K. Epidemiology of Patients with ESKAPE Pathogen Bloodstream Infection in the US Military Health System.

Ganesan A, Won S, **Ewers E**, Bradley WP, Schofield C, Utz G, Colombo R, Blaylock J, Lalani T, Kronmann K, Maves R, Okulicz J, Agan B. Factors Associated with Switching from Tenofovir Diproxil Phosphate to a Tenofovir Alafenamide Based Regimen in a Cohort with Unrestricted Access to Care and Medications.

IDCRP AWARDS & HONORS

During 2020, IDCRP investigators and trainees who participated on IDCRP-mentored studies were inducted as members of the Uniformed Services University of the Health Sciences (USU) Alpha Omega Alpha – Maryland Gamma Chapter based on their lasting dedication to scholarship, leadership, professionalism, and service. In addition, five trainees received awards at local research competitions for clinical research presentations based on findings from IDCRP-mentored studies.

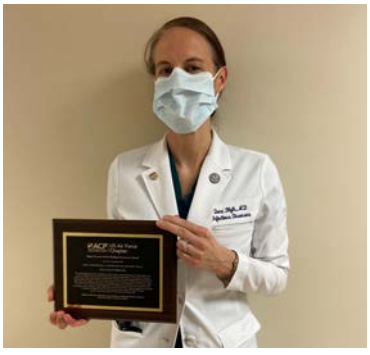
We congratulate CAPT Ryan Maves who was awarded the Navy Chapter of the American College of Physicians (ACP) Laureate Award, which honors those who have demonstrated steadfast commitment to excellence in medical care, education, research, and service to their community, chapter, and the ACP. We also wish to congratulate Maj Dana Blyth who received the Major General Archie Hoffman academic award, which honors early career physicians at a teaching military treatment facility (e.g., San Antonio Uniformed Services Health Education Consortium) for excellence in academic medicine demonstrated by clinical practice, clinical teaching, research, and/or accomplishments in motivating trainees to pursue research. Last, but certainly not least, we congratulate LTC Christopher Colombo on receiving the William Crosby Superiority in Research Award, which honors those who demonstrate excellence in the design, performance, and publication of peer-reviewed research.

Name	Award/Honor	Awarding Organization
Academic or General Award/Honor		
CAPT Ryan Maves	2019 Laureate Award	Navy Chapter of the American College of Physicians
Maj Dana Blyth	Major General Archie Hoffman award for outstanding Early Career Physician at an 'academic' MTF	Air Force Chapter of the American College of Physicians
COL Kevin Chung	USU Alpha Omega Alpha – Maryland Gamma Chapter	USU
LCDR Laura Gilbert	USU Alpha Omega Alpha – Maryland Gamma Chapter	USU
MAJ John Kiley	USU Alpha Omega Alpha – Maryland Gamma Chapter	USU
Capt Morgan Manley	USU Alpha Omega Alpha – Maryland Gamma Chapter	USU
Research-Related Award		
LTC Christopher Colombo	William Crosby Superiority in Research Award	Army Chapter of the American College of Physicians
Research-Related Award for IDCRP-Related Research Study		
LT Varea Costello	3rd Place for approved clinical research conducted under the Clinical Investigation Department by staff in the 35th Annual Academic Research Competition	Naval Medical Center Portsmouth
CDR Dave Jackson	CAPT Richard R. Hooper award for best presentation in clinical research	USU
CPT Trevor Wellington	Fellow podium research competition winner	Army Chapter of the American College of Physicians
LCDR Laura Gilbert	Fellow research award	Navy Chapter of the American College of Physicians
LT Elizabeth Cooper	Resident research award	Navy Chapter of the American College of Physicians

Left: LTC Colombo receiving the William Crosby Superiority in Research Award

Middle: Maj Dana Blyth with her Major General Archie Hoffman award

Right: CAPT Ryan Maves, recipient of the 2019 Laureate Award



IDCRP COLLABORATORS & PARTNERS

Department Of Defense Sites

U.S. Military Hospitals and Clinics

- Benning Martin Army Community Hospital, Ft. Benning, GA
- Brooke Army Medical Center, JBSA Fort Sam Houston, TX
- Carl R. Darnall Army Medical Center, Fort Hood, TX
- Fort Belvoir Community Hospital, VA
- Landstuhl Regional Medical Center, Germany
- Madigan Army Medical Center, Joint Base Lewis McChord, WA
- Naval Medical Center Camp Lejeune, Jacksonville, NC
- Naval Medical Center Portsmouth, VA
- Naval Medical Center San Diego, CA
- Rodriguez Army Health Clinic, Puerto Rico
- Schofield Barracks Health Clinic, Oahu, HI
- Soto Cano Air Base, Honduras
- Tripler Army Medical Center, Oahu, HI
- Troop Medical Clinic, Fort Sam Houston, TX
- U.S. Naval Academy, Annapolis, MD
- U.S. Naval Expeditionary Base, Camp Lemonnier, Djibouti
- U.S. Naval Hospital Okinawa, Japan
- Walter Reed National Military Medical Center, Bethesda, MD
- Wilford Hall Ambulatory Surgical Center, JBSA Fort Sam Houston, TX
- William Beaumont Army Medical Center, El Paso, TX
- Womack Army Medical Center, Ft Bragg, NC

U.S. Military Research Commands

- Naval Medical Research Center (NMRC)
  - Biological Defense Research Directorate
  - Enteric Disease
  - Viral and Rickettsial Diseases
  - Wound Infections
- NMRC—Subordinate Commands
  - Naval Health Research Center, San Diego, CA
  - Naval Medical Research Unit No. 6 Lima, Peru
  - Naval Medical Research Unit No. 2, Singapore
  - Naval Medical Research Unit No. 3, Sigonella, Italy
  - Naval Submarine Medical Research Laboratory
- U.S. Army Institute of Surgical Research
- U.S. Army Medical Research Institute of Infectious Diseases
  - Emerging Infectious Diseases
  - U.S. Military HIV Research Program
  - Viral Diseases Branch
- Walter Reed Army Institute of Research
  - Emerging Infectious Diseases Branch
  - Military HIV Research Program
  - Multidrug Resistant Organism Repository and Surveillance Network
  - Specimen Processing Laboratory
  - Wound Infections
  - Viral Diseases
  - Overseas Research Detachments
    - Armed Forces Research Institute of Medical Sciences, Bangkok, Thailand
    - U.S. Army Medical Research Directorate-Kenya, Nairobi, Kenya
    - U.S. Army Medical Research Unit, Tbilisi, Georgia
    - U.S. Army Medical Materiel Development Activity

Other U.S. Military Commands/Programs

- Defense Health Agency
  - Armed Forces Health Surveillance Division (AFHSD)
    - Global Emerging Infection Surveillance (GEIS) Program
  - Immunization Healthcare Division,
- Bureau of Medicine and Surgery, Department of Navy (BUMED)
- Congressionally Directed Medical Research Program (CDMRP)
- Defense Advanced Research Projects Agency (DARPA)
- Military Infectious Diseases Research Program (MIDRP)
- Navy Marine Corps Public Health Center (NMCPHC)
- San Antonio Uniformed Services Health Education Consortium

United States Government Health Agencies

- Biomedical Advanced Research and Development Authority
- Centers for Disease Control and Prevention
- Food and Drug Administration
- National Institutes of Health
  - National Cancer Institute
  - National Institute of Allergy and Infectious Diseases
    - Division of AIDS
    - Division of Clinical Research
    - NIAID Flu Networks
    - Division of Microbiology and Infectious Diseases
    - Vaccine Research Center
  - National Institute of Mental Health
  - National Institute of Neurological Disorders and Stroke
  - National Institute of Health Clinical Center
- U.S. Department of Veterans Affairs
  - Atlanta Veterans Affairs Medical Center
  - James J. Peters VA Medical Center, Bronx, NY
  - South Texas Veterans Health Care System
  - St. Louis Veterans Affairs Medical Center
  - Veterans Aging Cohort Study
  - Veterans Affairs Connecticut Healthcare System

Foreign Health Agencies and Organizations

- International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)
- National Institute for Public Health and the Environment (RIVM), The Netherlands
- Thai Red Cross AIDS Research Centre
- United Kingdom Ministry of Defence
  - Royal Centre for Defense Medicine, Birmingham, UK
  - Camp Bastion, Afghanistan
  - British Army Training Unit, Nanyuki, Kenya
  - Defence Medical Directorate, Birmingham, UK
  - Defence Statistics (Health) MOD Abbey Wood

Academia

- Bryant and Stratton College
- Case Western Reserve University
- Columbia University
- Drexel University
- Duke University
- Emory University
- Harvard T. H. Chan School of Public Health
- Icahn School of Medicine at Mount Sinai
- Johns Hopkins Applied Physics Laboratory
- Johns Hopkins School of Medicine
- Johns Hopkins Bloomberg School of Public Health
- Medical College of Wisconsin
- Michigan State University
- University of California-Los Angeles
- University of California-San Diego
- University of Georgia
- University of Glasgow, Scotland
- University of Maryland-Baltimore
- University of Minnesota
- University of Nebraska
- University of North Carolina
- University of Notre Dame
- University of Pennsylvania
- University of Pittsburgh
- University of Texas Health Science Center at San Antonio
- University of Texas Medical Branch
- University of Texas-San Antonio
- University of Toledo College of Medicine and Life Sciences
- University of Vermont
- University of Virginia
- University of Washington
- University of Wuerzburg Medical Center, Germany
- Washington University in St. Louis
- Vanderbilt University
- Yale University

Research Organizations & Industry Partners

- AstraZeneca plc
- Cherokee Nation Technology Solutions
- GlaxoSmithKline plc
- Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc.
- Integrated Biotherapeutics, Inc.
- Janssen Pharmaceuticals, Inc.
- Leidos Biomedical Research, Inc.
- The Lundquist Institute
- Menssana Research, Inc.
- NovaDigm Therapeutics, Inc.
- NovaVax, Inc.
- Scripps Research Institute

National Institute of Allergy and Infectious Diseases

IDCRP

Uniformed Services University

hjf

Infectious Disease Clinical Research Program

Uniformed Services University of the Health Sciences
Department of Preventive Medicine & Biostatistics

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