



Research Today



VOLUME 6, ISSUE 3

JULY 2020

Published by: Chief Scientist's Office
59 MDW/ST
(210) 292-2097

59th Medical Wing (59 MDW) AAHRPP Reaccreditation

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The Association for the Accreditation of Human Research Protection Programs (AAHRPP) granted the 59th Medical Wing (59 MDW) full accreditation in 2017 as the first DOD institution to receive such distinction. The initial reaccreditation is due in three years and subsequently every five years. AAHRPP is an independent, non-profit accrediting body which uses a voluntary, peer-driven, educational model to ensure Human Research Protections Programs (HRPP) meet rigorous standards for quality and protection. To earn accreditation, organizations must provide tangible evidence - through policies, procedures, and practices - of their commitment to scientifically and ethically sound research and to continuous improvement. The goals of accreditation are to improve the systems that protect the rights and welfare of individuals who participate in research, and to communicate to the public the strength of an organization's commitment to the protection of human research participants. AAHRPP conducted its first reaccreditation site visit of the 59 MDW on 1-2 June 2020, following a year of preparation that included a program self-assessment and multiple document submissions. Due to the COVID-19 pandemic, this was a virtual site visit primarily utilizing Microsoft Teams.

During the visit, site visitors interviewed numerous Researchers, Research staff, IRB members and protocol staff, Conflict of Interest staff, and other compliance Committee staff. Additionally, they reviewed numerous research studies, policies, and IRB materials. The process to obtain reaccreditation is an important, but complex one, which required team work from many stakeholders. The site visit out-brief noted several strengths of our program, specifically the supportive and educational approach to audits and the Conflict of Interest program, and our stable, well-integrated compliance infrastructure. They identified zero areas of concern. We intend to leverage these strengths to further enhance our research compliance and community outreach programs involving human participants. AAHRPP accreditation is an important step in strengthening protections for research participants. Each accreditation advances that objective and helps build public trust and confidence in research at 59 MDW.

Identify Novel and Optimal Diagnostic Assays for COVID-19 and Other Emerging Infections

With the COVID-19 pandemic continuing to threaten American lives, the Air Force 59th Medical Wing's Science and Technology (ST) Diagnostics and Therapeutic Research Program is actively responding to improve rapid diagnostics and accurate diagnosis of the infection for early intervention to improve military readiness. To accomplish this mission, we have set forth the following objectives: 1) Identifying rapid, accurate, field-deployable diagnostic platforms that can be used out in the field by warfighters and medics to quickly and accurately detect COVID-19 infection, 2) Comparing COVID-19 diagnostic platforms for accuracy and sensitivity to determine the optimal platforms to use and transition to a full 510k FDA approval, and 3) Expanding the approval of various sample sources and transport medias to be used for detection on certain diagnostic platforms to address the shortage of supplies such as nasopharyngeal swabs and viral transport media.

Currently, we have three projects funded by the Defense Health Agency and the Air Force Small Business Initiative Research agency to address our three objectives. The work will be carried out at the Center for Advanced Molecular Detection (CAMD) laboratory. Our first project is evaluating the sensitivity and specificity of a novel field-deployable real-time PCR platform called the Biomeme Franklin three9 system for COVID-19 detection in collaboration with the biotech company Biomeme. The Biomeme platform includes rapid GO-strips which enable nucleic acid extraction from samples, reverse transcription and amplification of the COVID-19 spike and ORF1ab genes all in one cartridge under 60 minutes. The results are then read on a smartphone allowing for simple use out in the field. Current samples sources approved for testing on the Biomeme system include nasopharyngeal swabs, oropharyngeal swabs and nasal swabs.



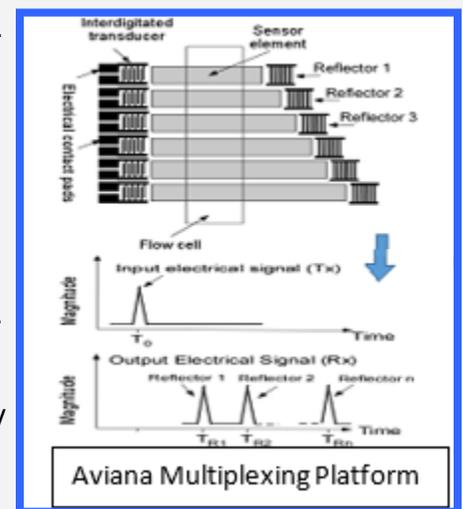
Biomeme Franklin three9 System
<https://biomeme.com>

The second project is the development of a novel, field-deployable diagnostic platform for COVID-19 based on acoustic wave technology in collaboration with Aviana Molecular Technologies. This field-deployable system has several channels that not only allows multiplexing with different variations of the same molecule (e.g antibodies against the 'S' and 'N' proteins of COVID-19 to detect the virus), but can actually multiplex different variations of different molecules (e.g antibody against COVID-19 'S' protein to detect the virus in one channel, along with a COVID-19 'S' protein antigen in a separate channel to detect for antibodies against COVID-19 for immunity). This set-up allows for both COVID-19 virus detection and immunity all in the same cartridge and on the same device in less than 30 minutes with results being displayed via Bluetooth on a smartphone. Current samples sources being tested include nasopharyngeal swabs, oropharyngeal swabs, nasal swabs, saliva and whole blood samples obtained by a finger prick.

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Our final project is a comparison study looking at the Cepheid COVID-19 Xpress assay kit vs the Biofire Diagnostics Film array for COVID-19 detection. This project seeks to 1) compare both assays for sensitivity and specificity in various sample sources including nasopharyngeal swabs, nasal swabs, oropharyngeal swabs and saliva to determine which assay, if any, assay performs best. 2) Validate that these assays work equivalently well in approved sample sources (e.g nasopharyngeal swab) and unapproved sample sources (e.g saliva) to obtain approval for sample use expansion. 3) Lastly, this project will perform a comparison of standard viral transport media vs saline for swab-based samples with respect to sensitivity and specificity to determine if saline can be used as an alternative transport media to address supply issues.

Altogether, the successful completion of these projects and objectives will improve the methods for detection and diagnosis of COVID-19, and assist in addressing reagent supply shortages that are currently hindering COVID-19 response efforts. Importantly, the open, modular design of the novel diagnostic platforms in development can also be used for detection of other pathogens and injury/disease biomarkers, enabling these platforms to be permanent improvements to DoD capabilities that can extend beyond the COVID-19 pandemic. Such capabilities will improve military readiness, return-to-duty rates, and response strategies to future pandemics and infectious diseases occurring military conflicts.



En route Care Research Center (ECRC) Stay at Home and Write Orders



Dissemination continues despite the new COVID-19 work environment. ECRC staff continue to be productive and collaborate on publications. Two manuscripts have recently been accepted for publication.

Maddry JK, Arana AA, Reeves LK, Mora AG, Gutierrez XE, Perez CA, Ng PC, Griffiths SA, Bebartta VS. Patients with traumatic brain injury (TBI) transported by Critical Care Air Transport Teams (CCATT): The influence of altitude and oxygenation during transport. Mil Med. In press.

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The goal of this study was to examine the effects of cabin altitude restrictions (CARs) on patients with TBI transported out of theater via CCATT. We conducted a retrospective chart review of patients with moderate-to-severe TBI evacuated out of combat theater to Landstuhl Regional Medical Center (LRMC) via CCATT. We collected demographics, flight and injury information, procedures, oxygenation, and outcomes (discharge disposition and hospital/ICU/ventilator days).

We reviewed the charts of 435 patients, 31% of which had a documented CAR. Nineteen percent of the sample had a PaO₂ lower than 80 mm Hg and 3% of patients experienced a SpO₂ lower than 93% while in flight. When comparing pre-flight and in-flight events, we found that the percentage of patients who had a SpO₂ of 93% or lower increased for the No CAR group, whereas the CAR group did not experience a significant change. However, flying without a CAR was not associated with discharge disposition, mortality, or hospital/ICU/ventilator days. Further, having a CAR was not associated with these outcomes after adjusting for additional flights, injury severity, injury type, or pre-flight head surgery.

Patients with TBI who flew with a CAR did not differ in clinical outcomes from those without a CAR. For now, we recommend that clinicians consider the findings of our study, use clinical judgement, and account for the circumstances of the mission to determine if CAR is indicated.

Savell, SC, Blessing A, Shults NM, Mora AG, Medellin KL, Muir MT, Kester N, Maddry JK.

Level 1 Trauma Centers and OEF/OIF Emergency Departments: Comparison of Trauma Patient Populations. Mil Med. In press.

The purpose of the study was to describe and compare the emergency department trauma patient populations of two level 1 trauma centers in one metropolitan city (BAMC and UH) as well as determine if DoD level 1 trauma cases were representative of patients treated in OEF/OIF emergency department settings. Data on emergency department patients treated between the years 2015 and 2017 were obtained from the two level 1 trauma centers (BAMC and UH, located in San Antonio, Texas); data included injury descriptors, ICU and hospital days, and department procedures.

Trauma patients were similar across trauma centers on injury type, injury severity, and discharge status; yet trauma patients differed significantly in terms of mechanism of injury and regions of injury. BAMC received significantly greater proportions of patients injured from falls, firearms and with facial and head injuries than UH, which received significantly greater proportion of patients with thorax and abdominal injuries. In addition, a significantly greater proportion of patients spent more than 2 days in the ICU and greater than two total hospital days at BAMC than at UH. In comparison to military emergency departments in combat zones, BAMC had significantly lower rates of blood product administration and endotracheal intubations.

The trauma patients treated at a military level 1 trauma center were similar to those treated in the civilian level 1 trauma center in the same city, indicating the effectiveness of the only DoD Level 1 trauma center to provide experience comparable to that provided in civilian trauma centers. However, further research is needed to determine if the exposure rates to specific procedures are adequate to meet predeployment readiness requirements.



SAUSHEC Research Day Winners

Resident Research Podium Competition

1st Place

Christian C. Lamb, Capt, USAF, MC; Internal Medicine

"Frequency of Extragenital Sexually-transmitted Infection Testing among USAF Members Diagnosed with HIV"

2nd Place

Amy M. Reed, Capt, USAF, MC; Urology

"The Role of Ureteral Stenting Following Uncomplicated Ureteroscopy for Ureteral and Renal Stones: A Randomized, Controlled Trial"

3rd Place

Kyle S. Stigall, Capt, USAF, MC; General Surgery

"Performance of a Novel Temporary Iliac Artery Shunt in a Military-Relevant Controlled Hemorrhage Swine Model"

Joint Austere Researchers Leading Environmental Efforts Against Infections like SARS-CoV-2

Despite recent events, Joint Austere researchers have been working hard and leading the way with important environmental studies. The ongoing DECON study is underway to offer methods, products and guidance for ground surgical teams (GSTs) and forward deployed medics that will help minimize the risk of infection resulting from combat trauma and high risk conditions. Phase I of the project tested known high-level disinfectants, some already in use by GSTs, in a model where sterile surgical instruments were placed in biological specimens. Results showed that all disinfectants had significant anti-bacterial activity but Cidex OPA (ortho-phthalaldehyde) showed the most robust activity. Phase I was recently completed and resulted in an MHSRS poster presentation and a manuscript accepted for publication in Military Medicine.

Phase II is currently in progress and involves testing another tier of EPA cleared disinfectants with a focus on products that were developed as wound disinfectants. The goal is to determine if wound disinfectants can do double-duty as instrument and surface disinfectants as well. Preliminary data suggests that some of the agents under investigation are also effective instrument disinfectants but more work is needed to confirm these findings. An abstract based on this work was accepted by MHSRS 2020.

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Another aspect of Phase II is the testing of environmental decontamination using hydrogen peroxide mist and constant low level hydrogen peroxide vapor. We are engaged in a variety of experiments to evaluate the efficacy of low level H₂O₂ vapor in reducing bacterial and viral contamination on a variety of surfaces. Ultimately we plan to test the efficacy of H₂O₂ vapor and mist against human coronaviruses including SARS-CoV-2.

"Enabling the New Mission"

With the significant increase in the testing of individuals for the presence of the coronavirus, there became a shortage of nasopharyngeal (NP) swabs that are necessary for collecting a clinical test samples of nasal secretions from the back of the nose and throat. To help combat this shortage, the Post Graduate Dental School downloaded free software files developed by the University of South Florida/FormLabs (maker of the PGDS 3D printers) that would allow them to 3D print NP swabs that were equivalent to commercially-available clinically-approved NP swabs. While the software, process, printers, and printing polymers were validated by the FDA for other sites including FormLabs' manufacturing site in Florida, the Post Graduate Dental School needed to develop quality control processes to ensure the NP swabs they would print would be viable, safe, and approved by the FDA. Mr. Tom Gardner, the 59th MDW Regulatory Advisor, assisted them with writing quality controls standard operating procedures and quality assurance documents for their printing processes. He then assisted them by reviewing their operating processes/parameters and coordinating with USAMMDA to submit their package to the FDA that was approved and enabled them to 3D-print NP swabs for collecting nasopharyngeal samples from patients during the shortage that met FDA standards.

COVID-19 Health Crisis

Since the onset of the COVID-19 health crisis, there has been a deluge of companies that submitted their unique COVID-19 detection tests and other medical support products to the Food and Drug Administration (FDA) for consideration of receiving approval under the "Emergency Use Authorization" or EUA process. The FDA's EUA process allows companies to bypass the normally-required rigorous testing and evaluation standards for marketing and selling medical products like test kits to the public, and instead use a truncated process with minimal acceptance criteria in order to expedite the availability of the medical products to the public. To help researchers, clinicians, and leaders understand these FDA EUA medical products, Mr. Tom Gardner, the 59 MDW Regulatory Advisor, began compiling information on the EUA-approved products, especially the various test kits being added to the EUA list daily, and provided an informative daily report

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that highlighted the key product parameters and created a ready reference for making comparisons, identifying limitations, and making decisions about new medical products becoming available for COVID-19 response. He is providing daily updates of this report for 59 MDW, AFMRA, and others that made sure decision makers had the best, most up-to-date information on recently approved medical products for COVID-19 response.

Civilian Achievement Award



In recognition of her distinguished performance as Senior Research Health Science Officer, Chief Scientist's Office, Science and Technology, 59th Medical Wing, Joint Base San Antonio-Lackland, Texas, from 14 October 2015 to 30 March 2019. During this period Ms. Michele Tavish's outstanding efforts for the Clinical Studies and Translational Research Program supported over 400 protocols and 23 research programs worth \$110 million dollars addressing translational medical developments that provided state of the art care for warfighters and their beneficiaries. Ms. Tavish regularly trained new research coordinators in protocol maintenance and regulatory

compliance; conducted on-going full protocol pre-audit reviews to ensure investigator compliance. Her work resulted in 100 percent of reviewed records being deemed 100 percent compliant. She was hand-selected to lead the Wing's Human Research Protection Program Conflict of Interest Program educating 280 wing staff this past year during Newcomers Orientation. Her efforts directly contributed to an outstanding Human Research Protection Program and Association for the Accreditation of Human Research Protection Programs accreditation, the first and only nationally accredited Human Research Protection Program in the Department of Defense. The distinctive accomplishments of Ms. Tavish reflects credit upon herself and the United States Air Force.

Air Force Commendation Medal



Second Oak Leaf Cluster

**Has been awarded to Technical Sergeant June Barrera
For Outstanding Service 21 September 2017 to 5 March 2020**

Technical Sergeant June E. Barrera distinguished herself in the performance of outstanding service to the United States while assigned to Center for Advanced Molecular Detection, Science and Technology, 59th Medical Wing, Joint Base San Antonio-Lackland, Texas. During this period Sergeant Barrera led a biomed research team of 11 members, collected seven million dollars of bio samples for a national study that protected 40,000 trainees and acquired one point two million

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dollars in vital lifesaving resources. She coordinated installation of a subzero freezer resulting in 25 percent increased storage capacity, prevented work stoppage and ensured the integrity of a two point four million dollar repository. Additionally, she responded to multiple critical power failures preventing 200,000 dollars in damages. Sergeant Barrera deployed for the 2019 New Horizons South America humanitarian mission, and with our triservice partners, rendered care for over 10,000 patients. Further, she demonstrated technical proficiency by identifying and solving a host of technical issues instrumental in maintaining seven research studies through the Defense Health Agency transformation. She initiated the first ever Fit to Fight fitness challenge fostering resilience, an active lifestyle and enhanced unit morale for over 135 personnel. The singularly distinctive accomplishments of Sergeant Barrera culminate a distinguished career in the service of her country and reflect great credit upon herself and the United States Air Force.

Air Force Commendation Medal



Third Oak Leaf Cluster

Has been awarded to Colonel Jacqueline M. Killian

For Outstanding Achievement 03 January 2019 to 18 May 2020

Colonel Jacqueline M Killian distinguished herself by outstanding achievement as Deputy Chief Scientist, Office of the Chief Scientist, Science and Technology, Joint Base San Antonio-Lackland. During this period Col Jacqueline Killian reinvigorated the unit's recognition and awards program by designing and socializing a more visible tracking mechanism for awards nominations. Her diligent follow up with unit leadership enabled all to capitalize on awards and recognition opportunities throughout the year. Her diligent and tenacious efforts resulted in 13 quarterly award nominations, nine quarterly award winners, three national award winners, and four group level annual individual and one team award winners. Overall recognition of the hard work and dedication of Science and Technology personnel increased by 250% from the previous year. The distinctive accomplishments of Colonel Killian reflect great credit upon herself and the United States Air Force.

Mr. David Sharon



We would like to introduce a new member to The Office of Research and Technology Applications (ORTA) team, Mr. David Sharon.

David is a transplant San Antonio native, having been born in the wilds of Loring AFB, Maine, and only venturing away to earn his BA degree in Political Science from Texas State University at San Marcos. He spends most of his days trying to keep pace with his four children and seeking out brave, new adventures for the family in the Alamo City and surrounding hill country, including biking, swimming, and hiking. David enjoys reading, listening to podcasts, good Texas food, and locally brewed craft beers. He is excited to be working within Science and Technology office as we support the warfighter in meeting its healthcare mission, and is

looking forward to working with everyone.

Commanders' Award

Congratulations to Lisa! She won the SAUSHEC Commander's research award for quality improvement and patient safety for her manuscript titled:

“Electronic Trauma Resuscitation Documentation and Decision Support Using T6 Health Systems Mobile Application: A Combat Trauma Center Pilot Program”

By Lisa Angotti, Remealle How, Katie Barnack, James Aden, Dominick Vitale, Jared Folwell, Jason Neel, Charlie Srivilasa, Valerie Sams



Congratulations Dr. Heyne

Congratulations Dr Heyne for successfully obtaining her EBP-C. The EBP-C is the only Professional certificate of added qualification for evidence-based practice. The rigorous process for obtaining this certificate involves completion of additional education, submission of a portfolio to demonstrate your EBP expertise and passing a certification exam.



Civilian of the Quarter: Dr. Jack Hutcheson

Congratulations to Dr. Jack Hutcheson who was named Civilian of the Quarter. Dr. Hutcheson is an efficient multi-tasker and great team player with a helpful demeanor. His versatility and knowledge has positioned him as a preclinical subject matter expert, as a liaison for recently developing directed energy efforts, and more recently in re-aligning his laboratory capabilities for strategic expansion. His leadership skills are evident in his ability to encourage and maintain staff morale of his 7 core scientific staff members with ever-changing requirements, particularly during recent COVID events. His networking and writing skills have promoted the development of countless relationships with external customers and the successful submission of grants as well as presentations. In his spare time, Dr. Hutcheson is engaged in the community by offering his time to judge science fairs for 5-11 year old students, provide immunology lessons for 8-10 year olds as a guest lecturer, and helps supervise youth at youth recreational clubs that promote child fitness. Dr. Hutcheson's dedication is truly impressive and the Trauma & Clinical Care (TCCR) Directorate is successful because of hardworking staff like "Jack".

SURF 2020 Poster Award Winners

3rd Place



Michelle N. Lee, MD
Maj, USAF, MC, FS
Endocrinology Fellow, SAUSHEC

For the poster

Gotta LADA? Identifying Differences in Adults with Latent Autoimmune Diabetes and Type II Diabetes to Improve Screening and Diagnosis

2nd Place



Matthew B. Burgess, BSE
U.S. Army Institute of Surgical Research
Combat Mortality Prevention Division

For the poster

The Effect of Hypoxia on Extracellular Vesicles from Adipose Derived Stem Cells

1st Place



Elizabeth M. Sanford, BS/MS,
Student, PhD in Psychology Program
Department of Psychology, University of Texas San Antonio

For the poster

Self-reported Hostility May Influence Reporting of Depressive and Somatic Symptoms, After Accounting for the Effects of PTSD Among Post-9/11 Veterans

ST Hails, Farewells & Recognitions

ST-Debra Niemeyer, Chief Scientist

HAIL- MSgt John Tyree

FAREWELL- Col Jackie Killian

STC Col Carol Walters, Director, Clinical Investigations and Research Support

HAIL- SrA Aslee McElroy, SSgt Latoya Seals, TSgt Jeremy, McCane, Dr. Ashley Nazario-Toole, Dr. Craig Koeller, Ms. Arlene Vasquez-Lerma, Ms. Kaysie Sutton, Ms. Nola Shepard

FAREWELL- SSgt Erin Toth, SSgt Tiffany Brooks, Ms Diandra Wood

STT-Dr. Amber Mallory, Director, Trauma and Critical care Research

HAIL- Dr. Steve Anderson, Kimberly Baker, Rosa Morales, Will Nava, Hope Salas, Jesse Coppage, Elizabeth Salazar, Desiree Romano, Justin Lamontagne, Deandra Wood, Chris Harwell

FAREWELL- Xandria Gutierrez, Anna Ochoa

SGA-Mr. Mike Dinkins, Administrator

FAREWELL- Maurice Edmondson

STN-Col Antoinette Shinn, Director, Center for Clinical Inquiry

FAREWELL- Col Jackie Killian

ST/T2-Dr. Scott Walter, Director Technology Transition & Transfer

FAREWELL- Mrs. Ehsaneh (Sunny) Shahhaidar

STH-Dr. Carl Brinkley, Director, Diagnostic & Therapeutics

HAIL- MSgt Tyree, Mr. Jesse Coppage, Dr. AJ Burdette, Mr. William Nava and Ms. Anna Ochoa

FAREWELL- Dr. Sandra Valtier, Ms. Samantha Hune, and Ms. Kristine Herrera

Science and Technology Contact Information



Our Vision

Grow Medical Leaders, Drive Innovations in Patient Centered Care and Readiness

Our Mission

Conduct clinical studies and translational research and apply knowledge gained to enhance performance, protect the force, and advance medical care and capabilities

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<http://www.59mdw.af.mil/News/ArticleDisplay/tabid/2553/Article/936338/science-technology-revolutionizing-tomorrows-military-medicine-today.aspx>