SCOPE

MAGAZINE OF NAVAL MEDICAL RESEARCH AND DEVELOPMENT

JAN-MAR 2022

CHARM

Continues to Study Long-term Effects of COVID-19 on Marines

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ISSUE 2 JANUARY-MARCH 2022

Editor's Desk

Welcome back to THE SCOPE.

For this quarter's issue, I got to talk with some fantastic leaders. I interviewed CAPT Beckett (page 14) on her recent award, thoughts on diversity, recognition and mentorship. She is also featured in this issue's cover story.

I teamed up with Erica Casper for a chance to speak with NSMRL's Commanding Officer and Executive Officer, CAPTs Shobe and Buechel (page 17) about Women's History Month.

This issue has taken some time to put together and is hitting your inbox later than planned. Thank you for patience, I look forward to improving the magazine over the next few months.

Thank you to all those who provided some great feedback on some great feedback from first issue.

-Tommy Lamkin

The Scope Issue 2 is published by
Naval Medical Research Center Public Affairs
503 Robert Grant Ave, Silver Spring, Maryland 20910

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Chief Petty Officer Jan Marayag, a laboratory technician with Naval Medical Research Center collects blood samples on Camp Foster, Okinawa, Japan, Jan. 24, 2022. (U.S. Marine Corps photo by Cpl. Lydia Gordon)

DAYTON TEAM

RECOGNIZED BY NAVY SG FOR CRITICAL CONTRIBUTION TO AVIATION SAFETY

By Zach Wilson

A senior researcher and his team from the Naval Aerospace Medical Research Laboratory (NAMRL) were presented with the 2021 Military Health System Research Symposium Outstanding Research Accomplishment Team/Military award.

Lead scientist Dr. Michael Reddix and his NAMRL team, together with collaborators from the Air Force Research Laboratory, spent five years working on the Green X project. This ground-breaking project supports a U.S. Coast Guard requirement to develop specialty eye protection systems to mitigate the risk pilots face from the illegal and unsafe practice of ground-based handheld laser pointers illuminating their cockpits.

The eyewear allows continued visualization of the cockpit instruments despite the laser threat. The team not only developed a new, state-of-the-art product specifically for the military, but also a variant that can be sold to private aviators as well as the civilian airline industry after Federal Aviation Agency approval.

They were recognized by the Surgeon General of the Navy, Rear Adm. Bruce Gillingham for their work in developing a monumental research achievement supporting aviation operations during a ceremony Nov. 9 at the Naval Medical Research Unit – Dayton on Wright-Patterson Air Force Base, Ohio.

"This is incredibly relevant to the potential aviation mishaps you will prevent in the future."

"This was terrific work, thank you!" Gillingham said. "This is incredibly relevant to the potential aviation mishaps you will prevent in the future." The Green X spectacles are specially designed eyewear resembling sunglasses that pilots can wear in dark conditions. These glasses protect them from potential dangers faced when laser devices of various types are aimed through the cockpit intending to disrupt the pilot's vision and impact their specific mission taskings. In some cases, according to NAMRL subject matter experts, Coast Guard pilots attempting night rescues were forced to re-attempt those approaches after interference from laser-wielding individuals. It was in this environment that the tasking to Dr. Reddix and his team was envisioned. According to the NAMRL team, to be acceptable, the solution would need to be compatible with cockpit instrumentation, night vision goggles, head-up displays, and out-of-cockpit visual aids. "The Laser Eye Projection spectacle is compatible with all six (Coast Guard) aircraft platforms," said Lt. Cmdr. Brennan Cox, NAMRL deputy director. "This remarkable team effort transitioned research from Advanced Technology Development… to a fielded, operational product in just five years, directly addressing a fleet need for combating an emerging airspace threat."

Capt. Walter Dalitsch III, NAMRU-D commanding officer and Dr. Michael Reddix attend a conference call for recognition from Rear Adm. Bruce Gillingham, Surgeon General of the Navy.

Reddix is a senior research scientist at NAMRU-D, having retired from the Navy as a Commander in the Medical Service Corps. He and his team collaborated across the services, although the original concept came several years before the research was developed and funded. After coordinating with the interested parties, the research began in earnest to develop and field the products to counter the danger the lasers presented.

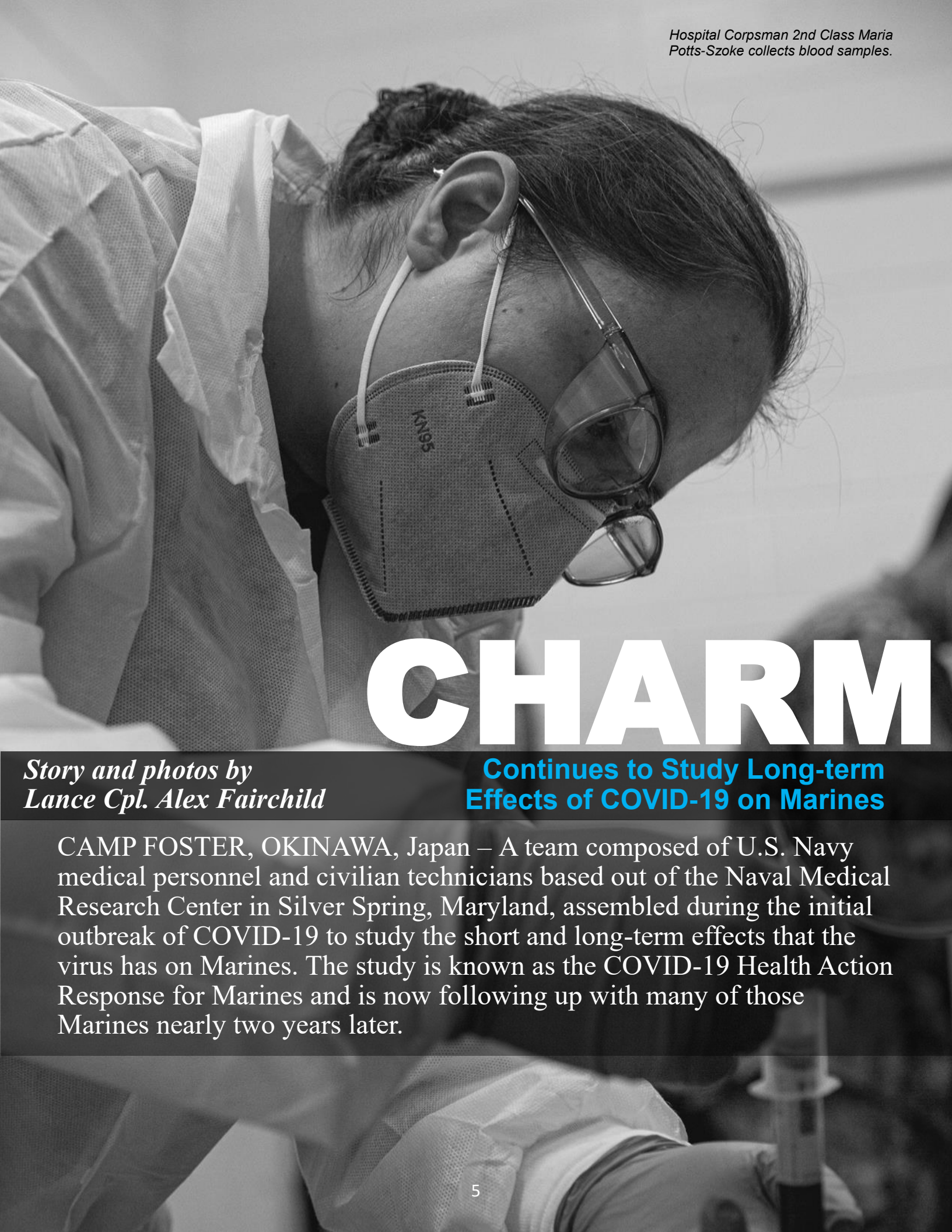
"The Coast Guard came to us in 2013 and asked for help; they not only wanted to know when they were being lased but also wanted to locate the source," Reddix said. "This was designated an 'urgent operational need' – we needed to leverage $10 million worth of research to address the challenges faced by modern cockpits which feature heads-up displays. (Several different colors of lasers) presented a challenge to visibility while using those systems."

Captain Walter Dalitsch III, NAMRU-D commanding officer, noted the fact that Dr. Reddix is "a legend in the aerospace medicine community" but also that he remained "in shock and awe of the amazing accomplishments of the scientists assigned here."

"The collaboration with other services and the key partnerships that helped accomplish this mission is representative of what a great family and team we have at Dayton," Dalitsch said.

Reddix credits the collaboration with the Air Force that came as a result of the 2010 Base Re-Alignment and Closure process that co-located NAMRL and the Environmental Health Effects Lab under NAMRU-D as well as with the Air Force's 711th Human Performance Wing. He saved his most significant praise for his team, particularly "the wing wearers" within the Medical Service Corps assigned here whose on-site flight testing of the spectacles during flight with the Coast Guard allowed the process to be completed. These members included Lt. Cmdr. Michael Tapia, Lt. Cmdr. Adam Preston and Lt. Sarah Sherwood from NAMRL. One more civilian professional, Ms. Bernadette McCann, rounded out the research team. "It would not have happened without them," he said.

NAMRU-D, which is made up of NAMRL and the Environmental Health Effects Laboratory (EHEL), is a medical research command focused on the enhancement of human performance and protection in extreme environments. The Command optimizes the readiness, performance, and survivability of operational forces through environmental health effects, toxicology and aerospace medical research and development. NAMRU-D is located at Wright-Patterson Air Force Base, Ohio. ■



Hospital Corpsman 2nd Class Maria Potts-Szoke collects blood samples.

CHARM

Continues to Study Long-term Effects of COVID-19 on Marines

Story and photos by Lance Cpl. Alex Fairchild

CAMP FOSTER, OKINAWA, Japan – A team composed of U.S. Navy medical personnel and civilian technicians based out of the Naval Medical Research Center in Silver Spring, Maryland, assembled during the initial outbreak of COVID-19 to study the short and long-term effects that the virus has on Marines. The study is known as the COVID-19 Health Action Response for Marines and is now following up with many of those Marines nearly two years later.

The CHARM study was founded in May 2020 to assist the Marine Corps in managing COVID-19 outbreaks occurring at the recruit depots; they also helped monitor the health of recruits who tested positive for the virus. The second iteration of the study was launched soon after and deployed to over 15 bases around the U.S. and Okinawa, Japan, to follow up and monitor the symptoms those recruits, who are now in the Fleet Marine Force, may be experiencing.

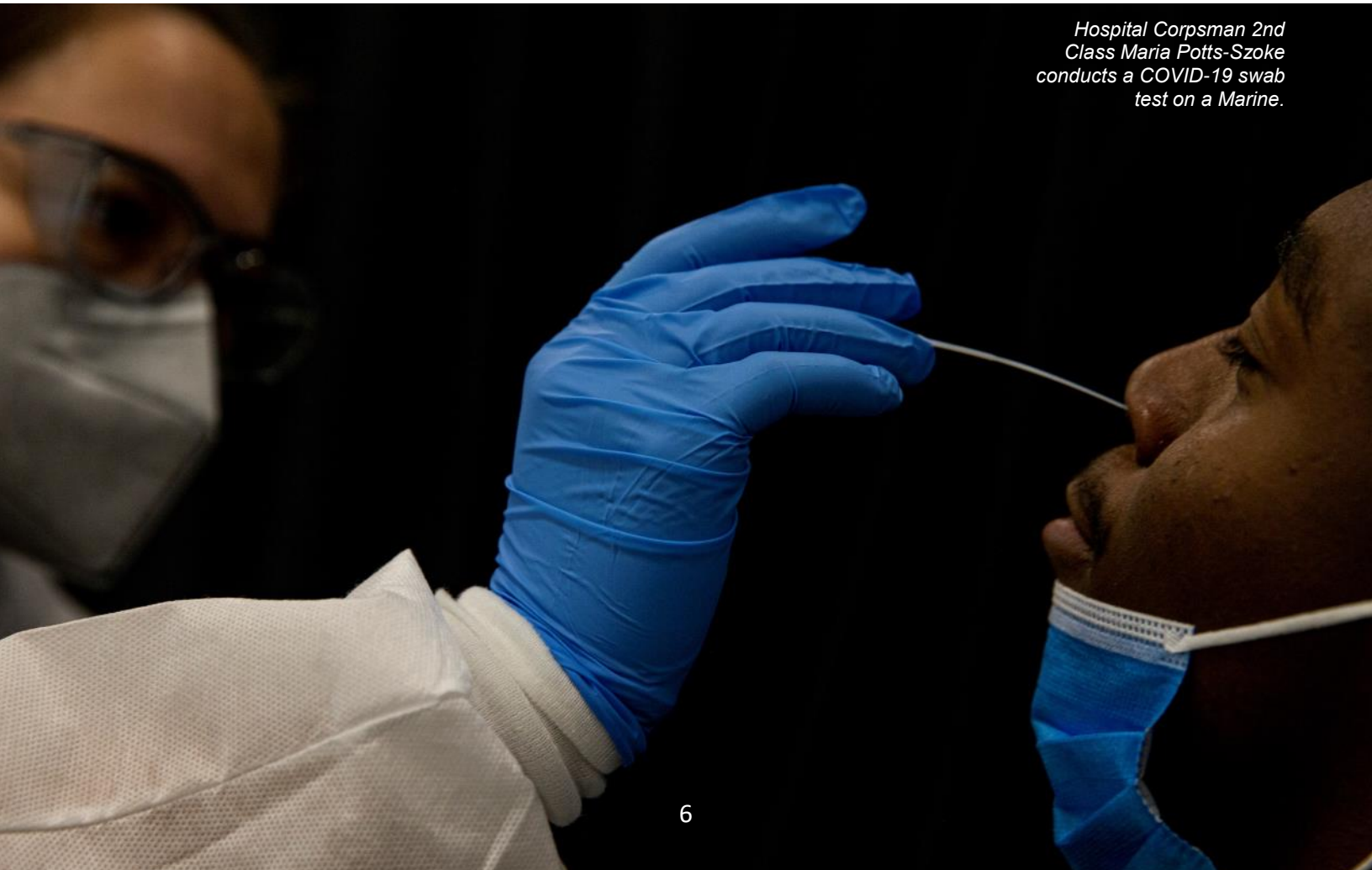
"The CHARM study is currently continuing its research here in Okinawa to follow up on participating Marines who contracted COVID-19 in the past," said Navy Capt. Charmagne Beckett, a research physician at the Naval Medical Research Center Silver Spring. "It is important that we travel across the globe to continue our research on these Marines and study the long-term effects they may have from contracting COVID-19 in the past."

"We are hoping to see long-term benefits of this study to help answer important questions on COVID-19"

Beckett explained that although the Marines being monitored in Okinawa have been through the research process before during recruit training, they are still provided with an initial brief and asked if they wish to continue participating in the voluntary study. She said that the first event of the study consists of the Marines filling out a questionnaire which gives them a chance to outline what symptoms they may still have.

After the Marines complete the questionnaire, they are taken through a series of tests that monitor breathing strength, cardiovascular strength, bodily responses to temperature, nasal swabs, saliva samples, and a blood draw. These tests are then compared to previous results that those Marines provided to the study to monitor the long-term effects.

Although the study is far from over, some of the results the CHARM study has suggested is that it is common for Marines who had COVID-19 in the past to experience symptoms such as loss of taste and smell and recurring nausea.



Hospital Corpsman 2nd Class Maria Potts-Szoke conducts a COVID-19 swab test on a Marine.

Hospital Corpsman 1st Class Brian Bryant organizes test results.

A patient conducts a breath strength test.

"Not only does the information from this research benefit Marines, but by extension, it also helps take care of local populations," said Beckett. "We are hoping to see long-term benefits of this study to help answer important questions on COVID-19 such as 'how does vaccination affect the symptoms and resistance of the Omicron variant?'"

Beckett explained that over the course of the study, the CHARM team continues to work together like clockwork to process results efficiently and monitor participating Marines. She said that each team member is a valuable asset responsible for their role in the study.

"As a laboratory technician, my role in CHARM is to preserve and take care of test results before they are processed at our facility in the U.S.," said Navy Petty Officer 2nd Class Maria Potts-Szoke, a hospital corpsman with the Naval Medical Research Center Silver Spring. "For example, when we receive a blood sample, we go through a process called peripheral blood mononuclear cell isolation to preserve the samples."

Potts-Szoke explained that since the CHARM study began, she worked as a laboratory technician with the team. She said that she feels humbled to be a part of a team that studies the effects of COVID-19 on Marines and contributes to their research efforts.

Through their travels around military installations, the CHARM study has successfully monitored over 800 Marines through its entirety.

"To me, this research is so important because it is giving back to service members and will have a lasting impact on the future," said Beckett. "When we head back to the U.S., we will continue to study these results and monitor the participating Marines to continue making an impact on the studies of the effects COVID-19 has on Marines." ■

Dr. William D'Angelo and Dr. Ashley Dacy brief David Dekunder, a staff writer with Joint Base San Antonio Legacy.

Naval Medical Research Unit - San Antonio Researchers Working on Portable Sterilizer for Medical Instruments

By Parmer Burrell

Biomedical engineers from Naval Medical Research Unit (NAMRU) San Antonio are working on developing a portable device with the capability of sterilizing medical instruments on the battlefield or in austere environments which will help in the treatment and recovery of wounded warfighters.

The prototype portable ozone sterilizer would enable frontline military first responders, including combat medics, corpsmen, dentists and surgical personnel, to sterilize instruments needed for dentistry and surgery, utilizing a process that would sanitize the medical instruments in a matter of minutes.

Dr. Ashley Dacy, of Wichita Falls, Texas, a NAMRU San Antonio biomedical engineer, said the portable ozone sterilizer would be adaptable to all environments, including the front lines, remote and austere locations where the climate is either hot or cold, and could be carried by one first responder since it would weigh approximately 45 pounds.

Dacy said the device gives first responders or forward surgical teams the capability to perform treatment in a battle zone, remote or austere environment when medical evacuation or dental services are not readily available for service members. The portable ozone sterilizer would have the capability to sterilize both surgical and dental instruments.

"Any kind of first responder will be able to use it and the people who benefit from it would be injured warfighters," Dacy said. "It can have potential benefits for mission readiness, as well as sterilizing dental instruments and other medical devices quickly and easily in remote locations."

Dacy said the portable ozone sterilizer could potentially save the lives of injured service members because it could effectively and quickly, possibly in as little as five minutes, sanitize medical instruments from bacteria, viruses and pathogens, helping to reduce the occurrence of secondary infections and possibly preventing the deaths of wounded warfighters.

Currently, Dacy said, the military uses an autoclave, a device that uses heat and pressure to produce steam for sterilizing medical instruments. She said these devices, which can weigh more than 300 pounds, are best suited for higher roles of care and military treatment facilities because they are so difficult to transport.

Dr. William D'Angelo and Dr. Ashley Dacy, brief David Dekunder, a staff writer with Joint Base San Antonio Legacy.

Fitted in a case, the ozone sterilizer contains every component needed to sterilize medical instruments, including a humidification chamber, a sterilization chamber and a user interface that presents ozone concentration, pressure, temperature and the remaining sterilization time to the operator.

The portable device uses concentrated oxygen to produce ozone, which is humidified and passed into the sterilization chamber where the instruments are placed, Dacy said. The process can also include the addition of water and hydrogen peroxide, which can speed up and help improve the sterilization of medical instruments.

"Ozone sterilization works by breaking down cell walls of bacteria and destroying the protective envelope of viruses and it can work very quickly, especially if you add something like hydrogen peroxide to produce more reactive chemicals," Dacy said.

Dr. William D'Angelo, of Newington, Conn., another biomedical engineer with NAMRU San Antonio, said the portable ozone sterilizer would be useful for prolonged care situations in a battle zone, in which injured warfighters would need to be treated for a longer period of time in the field beyond the "golden hour," which is the critical period of time in which casualties are treated on the field before being moved on to the next higher level of care.

"We are planning in future conflicts that we won't have that luxury (of the 'golden hour') because we won't have air superiority, we won't own the skies," D'Angelo said. "For prolonged care situations, you would need an ability to re-sterilize your instruments, if you are not able to get resupplied, in order to keep that capability of doing surgeries."

Research on the portable ozone sterilizer started at NAMRU-SA in 2013. So far, researchers have tested dental instruments in the device and plan to test how effective it is sterilizing surgical instruments next.

Dr. Sylvain Cardin, NAMRU San Antonio's chief science director, said the project to develop the device is in the pre-clinical trial phase, with more research being conducted to determine how effectively it can kill bacteria and pathogens within the sterilization process.

The success of the study, which began in 2019, is dependent upon volunteers.

According to Katie Geary, of Belcamp, Md., a research engineer with NAMRU San Antonio, the study has tested 45 subjects with the objective of testing 35 more.

NAMRU-SA researchers are working to ensure the prototype ozone sterilizer meets guidelines set by the U.S. Food and Drug Administration, which must approve the device before it goes out on the market. Cardin said he is hoping that process will be completed within five years.

While the portable ozone sterilizer is being developed for the military right now, the goal is also to have the device available for civilian use in emergencies such as mass casualty events, Cardin said.

"If you are in a remote area where a mass casualty event may occur, this device could be used by FEMA (Federal Emergency Management Agency) and some first responders," Cardin said. "The ultimate goal of our research and development is to save lives, and that's very important." ■

MILCO:20

Largest Health Study of US Military Personnel Commemorates 20 Years of Research

By John Marciano

Military personnel who deployed and experienced combat have elevated long-term risks for multiple health conditions, including asthma, obesity, sleep problems, and posttraumatic stress disorder (PTSD). These and other research findings from the first 20 years of the Millennium Cohort Study are summarized in a comprehensive review published in the Annals of Epidemiology https://www.sciencedirect.com/science/article/pii/S1047279721003458

The Millennium Cohort Study is the largest and longest-running health study in US military history. It was established by the Department of Defense (DoD) in 2001 under a Congressional mandate to evaluate the impacts of military service, including deployments, on the long-term physical health, mental health, and quality of life of military personnel. Over 260,000 service members from all branches of the military, including Active, Reserve, and National Guard personnel, enrolled in the study between 2001 and 2021. Enrolled study participants complete surveys approximately every three to five years, even after they leave military service. Follow-up of participants will continue through at least 2068.

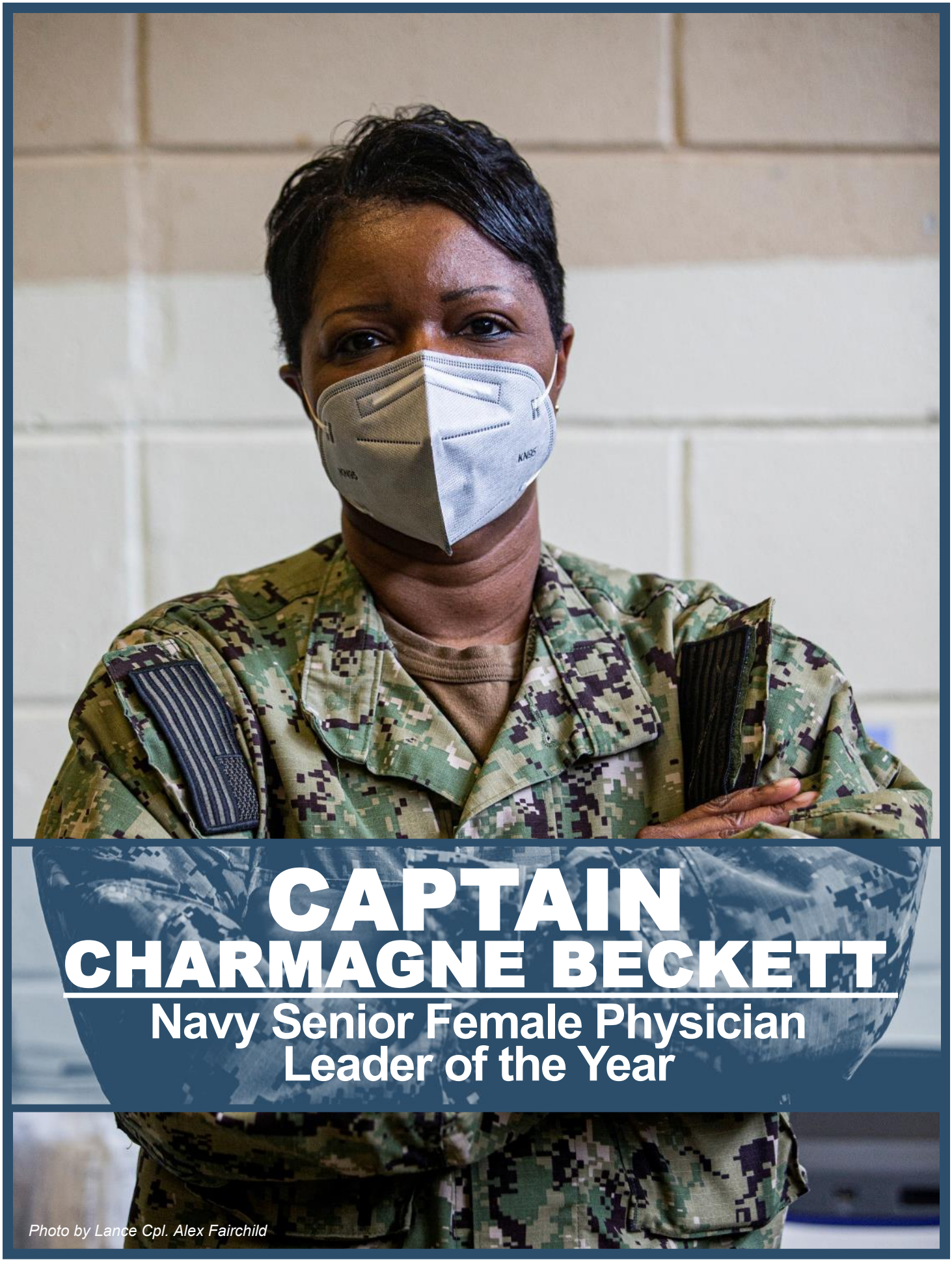
"We owe a tremendous amount of gratitude to over a quarter of a million service members from multiple generations who volunteered to be a part of this lifelong study. Their continued contributions to the study provide valuable insights for understanding and improving the health and readiness of former, current, and future service members," said Dr. Rudy Rull, Principal Investigator of the Millennium Cohort Study.

Findings from the Millennium Cohort Study document not only the potential long-term health impacts of military service, but also the resilience of service members. For example, approximately 85% of participants who deployed consistently reported no or low levels of symptoms associated with posttraumatic stress across multiple surveys after deployment.

"The Millennium Cohort Study is a tremendously important resource for understanding how to promote the health and well-being of our most vital asset: our service members and veterans. This new publication elegantly summarizes a 20-year legacy of impactful work by a dedicated community of researchers that help shape policies geared toward improving their health," said Captain Dennis J. Faix, Commanding Officer of the Naval Health Research Center.

The Millennium Cohort Study is headquartered at the Naval Health Research Center (NHRC) in San Diego, California and is sponsored by the DoD and Department of Veterans Affairs.

NHRC's mission is to optimize military operational readiness through cutting-edge research on warfighter, veteran, and family health. NHRC supports military mission readiness with research and development that delivers high-value, high-impact solutions to the health and readiness challenges our military population faces on the battlefield, at sea, on foreign shores and at home. NHRC's team of distinguished scientists and researchers consists of active-duty service members, federal civil service employees and contractors, whose expertise includes physiology, microbiology, psychology, epidemiology, and biomedical engineering.■



CAPTAIN CHARMAGNE BECKETT

Navy Senior Female Physician Leader of the Year

Photo by Lance Cpl. Alex Fairchild

OKINAWA. Japan. (Jan. 24, 2022) Beckett speaks to a Marine about COVID-19/Lance Cpl. Alex Fairchild

By Tommy Lamkin

Capt. Charmagne Beckett, a Medical Corps officer assigned to Naval Medical Research Center (NMRC) was awarded the Military Health System (MHS) Female Military Physician Leadership of the Year award in the senior Navy category. The award recognizes the best women in healthcare across the services.

Established to honor superior performance for female physicians, the award focuses on four areas of significant impact: major contributions in their primary field, contributions to enhancing the role of women in medical service, leadership ability and community service.

Born and raised in Detroit, Beckett did not have much money growing up. Determined to achieve her dream of a college education, she pursued grants and scholarships for college. After high school, she attended the University of Michigan. While Ann Arbor was buzzing about the "Fab 5", she studied biology. A fellow student told her about the Health Professionals Scholarship Program, a way to receive full tuition in exchange for military service. Liking the opportunity, she applied and was accepted into the program and enrolled tp Wayne State School of Medicine in her hometown.

Fresh out of school and with a crisp new sea bag, Beckett reported to Naval Medical Center Portsmouth for an internal medicine residency. That was some time ago. While many medical officers came and went, Beckett stayed the course … and did so for three decades. "I think I stayed, because it was a great fit and I was pretty sure it was a great path to continue on."

Beckett has sailed aboard the USNS Mercy, engaged in Pacific Partnership, mobilized with small teams and served overseas. She was there to offer tsunami assistance and humanitarian aid to various countries when needed. She was in Asia for SARS-CoV-1 and is now actively engaged in research on COVID-19. "I recognized the need to engage with host nations, and that we may need to step in and assist," she said. "The Navy is an agile service; we really show that in support."

Beckett has witnessed many changes in the Navy, both culturally and in policy shifts. Many of the rules that once restricted the role of women in the U.S. Navy are gone. "I tell [women] students and young [women] professionals, that they can do anything; there are very few barriers in the Navy these days, or things that you cannot change. I see opportunity, yes the Navy can be hard, but overall this is a rewarding career that I think is unmatched."

SILVER SPRING, Md. (Dec. 1, 2021) Beckett, (right) administers the oath during a promotion ceremony/Mike Wilson

At NMRC and across the fleet, Beckett is a role model. A mentor and guide to Sailors, women, people of color, physicians, medical professionals and students. "I fully recognize that I am a role model and people are looking at me. I want to present myself as the best model."

A product of great mentorship herself, Beckett says that mentorship is very important for her. "I like to put myself out there, for whoever is looking and may need advice on their career, professionally, personally. I think the junior female officers and enlisted are looking to me."

The Navy has made changes aimed to integrate women in all aspects of service, growing their role. Is it still necessary to have accolades that are only for women? When asked, Beckett says, "While women have come along, major milestones are still making news. I am encouraged that we recognize diversity. It is important to hone in on representation. It lets us know that women can be admirals, can lead hospitals, lead organizations. That is what I have seen; women have been afforded more opportunities."

"This award was created to bring women forward and recognize them," she added.

The 2021 MHS Female Navy Physician Leadership of the Year award recognizes superior achievement in medical service. Beckett joined winners from the Army, Air Force, Coast Guard and Public Health Service at the annual Association of Military Medical Surgeons of the United States (AMSUS) meeting held virtually for award presentation.

"It was definitely a wow moment to have been selected. I am humbled and blessed. There are many people who have contributed to my success," she said. "I'm very appreciative of the recognition."■

QUANTICO, Va. (July 20, 2021) Beckett, speaks to a Marine about COVID-19./Joseph Battley III

Q&A

with Capt. Katharine Shobe *and* Capt. Jennifer Buechel

By Erica Casper with Tommy Lamkin

At Naval Submarine Medical Research Laboratory (NSMRL), the commanding officer and executive officer are both women. Capt. Katharine Shobe, NSMRL's commanding officer, took the helm in August 2020, and Capt. Jennifer Buechel assumed the role of executive officer in June 2021. To have two women in these two command leadership roles at the same time is a historic first for the command. We recently had the opportunity to sit down with them to discuss their careers in the military within the context of Women's History Month.

Shobe aboard USS Augusta (SSN 710), 2006

This interview has been edited and condensed for clarity.

EC: What led you to a career in the military?

KS: I did not consider a career in the military until my final year of graduate school. I was studying to get my Ph.D. in cognitive psychology, hoping to go the academic route. And then I did a summer internship in Washington, D.C. at the National Academy of Sciences. I had a life-changing personal experience that changed my perspective on the research I was conducting, leading to a loss of faith in academic research. I returned for my final year of graduate school, and saw an ad in the trade publication for the Association for Psychological Science. I submitted my resume and I came up here to Groton to give a job talk at NSMRL. One thing led to another, and I was commissioned in the Navy without, to be honest, fully understanding what I was getting into. [chuckles]

JB: I considered the military in my last year of nursing school. I always had a sense of adventure and travel. One of my professors was in the Army Reserves, and it sounded exciting and fun. I had to work for a hospital for two years to pay back my nursing school tuition. During the tuition pay back, I joined the Reserves for two years. I loved it and here I am.

EC: Did either of you have family history with joining the military or were you the first?

JB: My uncles were. One was Army, one was Navy. My uncle would wear my ship's ball cap when he used to go to the hospital to get cancer treatments, and brag about his little niece who was an ensign in the Navy.

KS: My dad was an electronics technician in the Navy for about three years before I was born. When I applied for the Navy it didn't occur to me that my dad had served, because he didn't talk about it a lot. But when I commissioned in the Navy, he spoke about it more, and you could tell he was really proud I was an officer.


Buechel, (right) and shipmates aboard USNS Comfort (T-AH-20), 2001

TL: When did you decide to make the Navy a career?

JB: In the Nurse Corps we have specialty codes for the type of nurse that you are. My specialty was as an Intensive Care Unit [ICU] nurse, so I knew that I would always have to be operational or in the large medical treatment facilities, like in San Diego, California or Portsmouth, Virginia. When I went from the Reserves to active duty, I thought I was just going to finish four years in the Navy and go back home. But I was enjoying it, and then I hit my ten year mark, and I said, you know, I'm loving this, so why not [keep going]? After I got off a ship, I thought about going with the Marine Corps, because I enjoy operational nursing, but there was an opportunity to apply for Duty Under Instruction for a Ph.D. program. So I decided to apply for it, was accepted, and got my Ph.D. I started doing more executive research leadership. That was never my track to begin with - I thought I'd always be clinical or in ICU settings.

KS: When I joined the Navy, I didn't give a career much thought. I took it one billet and one job at a time. To be honest, it's a difficult transition from academic life to life as a naval officer, and there were some growing pains. But I figured as long as I found it rewarding and worthwhile, I would continue. I also had a couple of good mentors in my community who gently encouraged me and instilled confidence that I could fill leadership positions.

Shobe at-sea with the Augusta, 2006

EC: Were they any significant obstacles in your path?

KS: Each position that I took on reinforced the idea that I really liked the community and being able to directly have an impact on the health, welfare and operational readiness of the Navy and Marine Corps. As an officer, your major wickets are the promotion boards, so as long as those went well, I took that as an endorsement that I should continue, as long as I was enjoying it. I did not explicitly set out to become a captain or a CO, but it goes back to my colleagues or mentors who would make comments like, "I see you as a CO of a research lab." I try to pay that back now that I'm in a leadership position.

EC: Can you describe your mentors?

KS: I think the key thing for me was seeing people in leadership positions that may not have fit the typical leadership mold or stereotype. I feel like in the military, there's this stereotype that COs are outgoing and gregarious, but seeing leaders who were a little more introverted and reflective, set the example that we could be our authentic selves while serving in leadership positions.

JB: Our current Nurse Corps admiral is very supportive of nurses keeping up their clinical skills, because any day I could go to war. At

Buechel aboard USS Harry S. Truman (CVN 75), 2010

my last command, my deployment platform was Expeditionary Medical Facility Bravo, so I got multiple notifications to possibly deploy. For example, with COVID, a lot of folks I knew went to NYC, or the Mercy, and the Comfort [hospital ships]. We have a lot of nurses currently in Texas, Arkansas, the Dakotas, who are helping with the COVID response right now - active duty nurses serving in civilian hospitals.

KS: As a scientist, you would never expect to deploy, but in 2010 I did deploy to Afghanistan as part of a three-person mission called the mobile care team. The team consisted of a psychiatrist, a research psychologist, and a corpsman psych tech. The mission was to conduct behavioral health surveillance of the Navy Individual Augmentees [IAs] in Afghanistan. We conducted a survey and I was in charge of that, along with being the Operations Officer. When the opportunity first came up, the billet was coded for males only, so I had to fight to go to Afghanistan. I fought for the

Buechel (left) aboard Comfort, 1999,

Shobe returning to Afghanistan, 2010

opportunity because I was stationed at the Naval Health Research Center [NHRC] at the time, and we did the back-end support for the team in Afghanistan. During this time, the CNO became aware that the Navy IAs were psychologically struggling because they were removed from their commands stateside and shipped out to Afghanistan to support the Army or the Air Force or to be a detention guard with little training. So our job was to collect actionable medical intelligence to send back to either the CNO and his staff or to the unit commander and medical staff about how folks were doing. We developed the survey at NHRC and did a lot of the behind-the-scenes work, so I was intimately familiar with it. That's why it made sense for me to deploy as part of the team. As part of the deployment, we had to do pre-combat deployment training in Fort Jackson in South Carolina on an Army base. I did a lot of things I never would have expected to do with a Ph.D. in cognitive psychology. We completed a Mine-Resistant Ambush Protected vehicle rollover, land navigation, and pistol and rifle quals. For me, the key takeaway is to take advantage of these opportunities to challenge yourself personally and professionally.

TL: March is Women's History Month (WHM), and I'm very curious about what that means to you and why celebrating WHM is important.

KS: My perspective on WHM, and whatever month or group we are recognizing, is to set aside time to reflect on those groups of individuals and their contributions to the Navy, and also to have a discussion about the challenges that may still exist for that group. Once a year the Naval Institute Proceedings magazine puts out photos of the Joint Chiefs of Staff and all the Navy admirals and the Marine Corps generals. Out of 270 admirals, there are 22 female admirals - about 8%. For the senior enlisted leadership, there is one female force command master chief out of 35. So that's 3%. What can we do at our level to help increase more diverse representation not only of sex, or ethnicity, but diversity of thought? At the CO level, what can I do within the command? Maybe that's encouraging someone at the command to take a position they may not have thought about. Maybe that's showing some of my own vulnerability – I still get nervous before all-hands – I do not like public speaking! Senior leaders still have hard days and bad days. The good news today is that all the communities in the Navy are open to women. The XO and I are part of a Facebook group for female nNaval officers. When the CO of the Constitution [first female CO in ship's history] was making headlines, it was a powerful thing to experience that type of victory. While powerful, it still reminds us that we are experiencing "firsts" for female Sailors and Officers.

JB: We need to make people aware, and stop the biases. I think women in the military still have a long way to go. If you look on the wall in the NSMRL command suite of past COs, they are almost all white men. But our past CO and our current CO are female, and that's amazing. It doesn't matter if it's a woman or Hispanic or African-American or Asian, we've got to break these boundaries.

EC: You're the only two female captains on the base?

KS: We are the only female senior officers here.

JB: Even in the fleet, the first female CO of an aircraft carrier was just announced.

EC: You are the first all-female leadership ever at NSMRL. Capt. Shobe, you're our second female CO, and Capt. Buechel, you're our first female XO. What do you think is the impact of that on the lab?

JB: It shows that women can be in leadership positions. The Navy tries to prevent harassment and stereotypes, but we're a microcosm of the outside world, and people do come into the Navy with stereotypes. I think it shows that a leader can be a mother, and can be a wife, and can be a leader, and can do a very effective job for the Navy. Most science is male-dominated, and to have female leadership can bring more respect and more tolerance of everybody and can break a lot of barriers.

KS: Day to day, I don't really think about the fact that we're female COs and XOs, until I walk by that board in the command suite and it shows all the previous COs who were white males. I've never had a female CO or XO, so I just try to put myself in the shoes of the junior corpsmen or the other officers here, and plant the seed of the idea in their heads, that it's feasible, it's doable: "If she can do it, I can do it!"

EC: What female public figure, past or present, has inspired you and why?

KS: There's not a single female person that has inspired me, but where I get inspiration is from the women that I interact with on a day-to-day basis or women that I was exposed to as a junior officer. Since we're framing this conversation in the context of being a Naval officer and leadership, I mentioned I've never had a female CO or XO, and I wasn't really exposed to someone like that until maybe 10 years after I was in the Navy. I went to a leadership conference called the Joint Women's Leadership Symposium, which is held every year. The keynote speakers are typically senior female officers and enlisted across the services. That was the first time I heard General Salinas speak, who was a Marine Corps general in charge of the Marine Corps Recruit Depot in San Diego. It just opened my eyes to this whole new world of leadership opportunities. I am inspired by everyone's stories of things that they overcame on a routine basis to excel at their job in the Navy.

EC: Has that Facebook group helped?

KS: The two things I really value that group for are – 1. It has definitely expanded my network. For any issue, a relevant person in the Navy that's part of the group will reach out and say, "I have this for action. Send me your information and I'll get you an answer." For everything that comes up, there's a senior officer on there that can address it. It's a very positive experience. And 2. I've been exposed to a whole new set of issues and challenges I never would have known about. People are very candid about sharing their personal stories, from family issues, to feeling like they weren't being listened to and supported by their commands. Some of these things I may have not personally experienced, but just raising that awareness in me as a leader has been really, really valuable.

TL: Is it an officer group or senior leaders?

JB: It is a female officer group, any O1 or above. Some of them are retired now, and some are midshipmen that are about to join the Navy.

KS: There are volunteer administrators that check to see if you fit the criteria for group membership.

EC: What advice would you give to women who know they want to move into military leadership roles?

JB: I would say, overall, it was the best decision of my life and I have no regrets. Just do it. You're going to make mistakes, you're human. I was sitting next to Brig. Gen Simonson at an event, and she shared with me what her dad used to tell her: "All you can do is your best and as long as you do your best, you're good to go."

KS: There's going to be many times when you feel like you're not prepared to do something outside your comfort zone. If your boss says, "This working group came open, or this opportunity is available," the first response for many people is to think, "I'm not ready. I'm not qualified." But really the only way we learn, as humans, is through pushing ourselves and taking on these challenges. So my advice for anyone would be to take advantage of those opportunities and if you feel anxious or nervous about something, then that's probably a good sign that you should do it. You've got to give yourself a little pep talk: "Yes, I can do it." Then it often turns out to be the best learning experience ever.

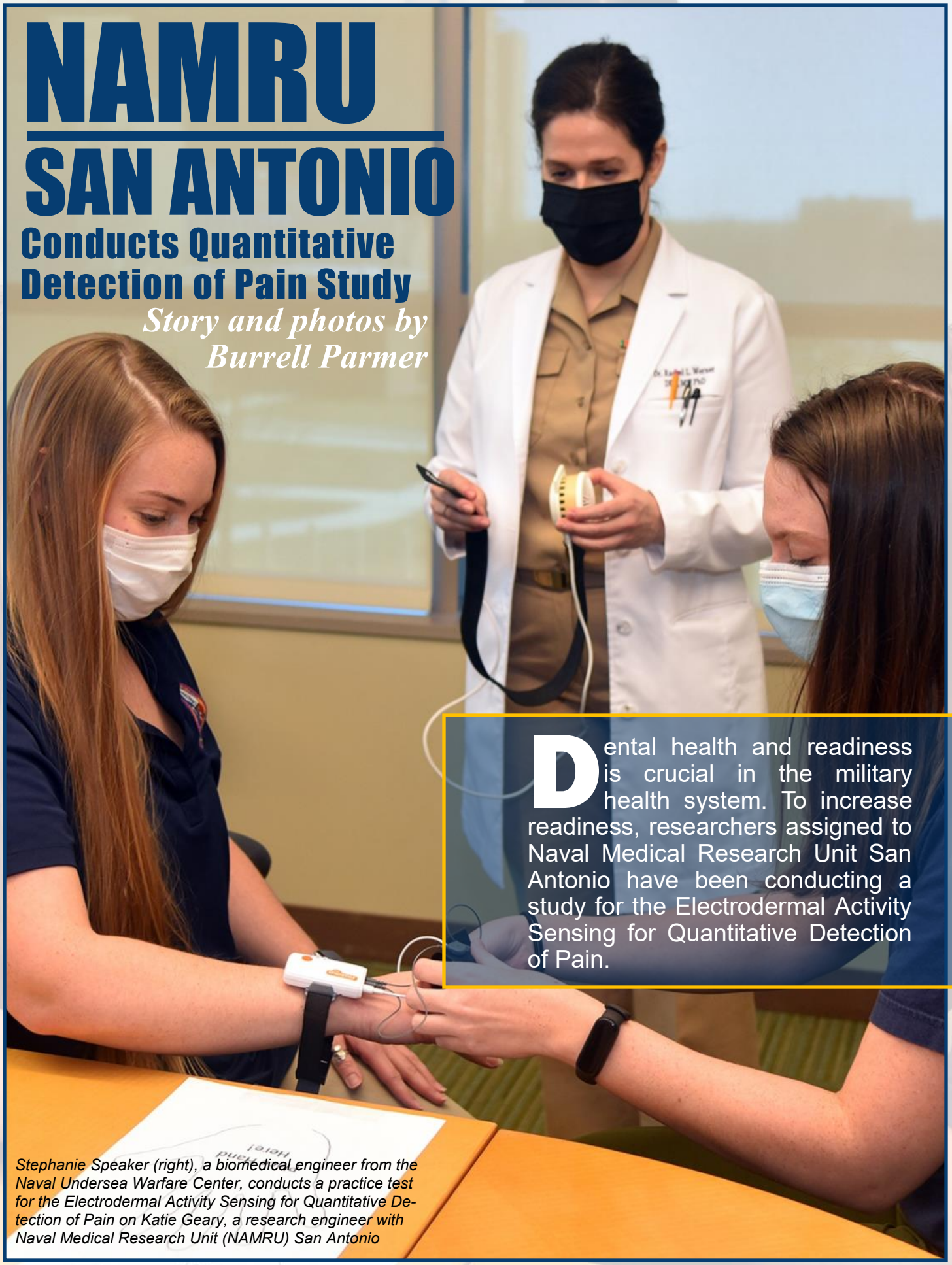
TL: Thank you so much for taking the time to speak with us.

EC: Thank you both! It has been wonderful to hear more about your career paths and how you've gotten to where you are today . ■

NAMRU SAN ANTONIO

Conducts Quantitative Detection of Pain Study

Story and photos by Burrell Parmer



Dental health and readiness is crucial in the military health system. To increase readiness, researchers assigned to Naval Medical Research Unit San Antonio have been conducting a study for the Electrodermal Activity Sensing for Quantitative Detection of Pain.

Stephanie Speaker (right), a biomedical engineer from the Naval Undersea Warfare Center, conducts a practice test for the Electrodermal Activity Sensing for Quantitative Detection of Pain on Katie Geary, a research engineer with Naval Medical Research Unit (NAMRU) San Antonio

Cmdr. Drew Havard (right) speaks with Dr. William D'Angelo regarding a study for the Electrodermal Activity Sensing for Quantitative Detection of Pain.

According to Cmdr. Drew Havard, of Gulfport Miss., NAMRU San Antonio's deputy director for Craniofacial and Restorative Medicine, electrodermal activity effecr fluctuations in the electrical characteristics of the skin, typically controlled by the sweat glands.

"More sweat means more skin conductance and thus more electrodermal activity," said Havard. "When you start to get anxious or are in a state of discomfort, your palms are typically sweaty or clammy. We believe that a machine learning algorithm can be trained to distinguish between pain and anxiety based on this activity to help dental care providers provide optimal care to their patients."

"This tool would potentially help distinguish pain from anxiety to allow providers to better treat patients," he said.

"Accurate determinations of pain will lead to a more appropriate use of pain medications and therefore will increase patient safety and potentially lower costs. Anxiety may also be determined and addressed making patients more likely to participate in routine care before dental emergencies occur," said Havard.

The more volunteers we can recruit for this project, the better our final product will be," said Katie Geary, who has been actively working in the field of Biomedical Engineering since 2015. "Machine learning algorithms are only as "smart" as the data they are trained on allows them to be. The more subjects we recruit, the larger our data pool to train from and the better our final algorithm will be at making an educated guess as to how patients are feeling."

As the project is still in the data collection and preliminary algorithm training phase, NAMRU San Antonio expects it to be deployed for clinical testing in 2023.

Referred to as the "EDAPS" program, the system would be deployed in all Department of Defense (DoD) dental facilities after development and testing.

There are seven NAMRU San Antonio team members on the project to include Havard, Geary, Jacqueline Villanueva, Justin Bequette, Dr. William D'Angelo, Cmdr. Leslie Trippe, and Cmdr. Rachel Werner. Additional support is being provided by Stephanie Speaker, a biomedical engineer from the Naval Undersea Warfare Center who is temporarily assigned to NAMRU San Antonio. The team also collaborates with Dr. Ki Chon from the University of Connecticut and members of his laboratory: Dr. Hugo Posada-Quintero, Youngsun Kong, and Andrew Peitzsch.

The procedures in this study are designed to create the illusion of pain in one phase and slight discomfort the second phase without creating any real damage to the patient. ■

The Electrodermal Activity Sensing for Quantitative Detection of Pain study team.

LOOKING Aft

with André B. Sobocinski
Historian, Bureau of Medicine and Surgery

Remembering Captain Norman Lee Barr (1907-1979), Flight Surgeon, Medical Researcher and Father of Biotelemetry

On August 10, 1956, a high-altitude balloon carrying two Navy aeronauts—LCDR M. Lee Lewis and LCDR Malcolm D. Ross—landed in an alfalfa field south of Stevens Point, Wisconsin. The balloon had been launched earlier in the day from the University of Minnesota as part of the Navy's Stratolab Project, a collaborative effort led by Office of Naval Research (ONR) and the Naval Medical Research Institute (NMRI). Its mission: to study humans in high-altitude environments, atmospheric conditions and conduct research from—what was termed—the first "space" laboratory. Among those on hand to witness the end of the historic flight was a Navy flight surgeon and medical researcher named CAPT Norman Lee Barr.

Capt. Norman Lee Barr (left) observes the pulse rate and electrocardiogram of a subject in a remote location, 1967.

High-altitude balloons were a pivotal step towards launching humans into space; and physicians like Barr were among the first aerospace medical researchers helping to pave the way for Project Mercury.

The Stratolab gondola was Barr's vehicle for testing a biotelemetry system that he had originally developed in 1949. As it ascended 40,000 feet in August 1956, Barr was able use his system to monitor the aeronauts' body and skin temperatures, electrocardiograms, and respiration rates from the ground.

This biotelemetry innovation was one of many interesting chapters in the remarkable career of Norman Lee Barr. Long before entering the Navy, the Myrtlewood, Mississippi-native joined the Army Air Corps (forerunner of the U.S. Air Force) in 1929. He attended the Army Air Force Flying School at Kelly Field, Texas and earned the dual-designation "Airplane Pilot" and "Airplane Observer" in November 1929. Over the next two years Barr served at Mitchel Field, Long Island and later France Field, Panama Canal Zone where he flew reconnaissance missions with the 99th Observation Squadron, 24th Pursuit Squadron and the 25th Bombardment Squadron.

While stationed in the Canal Zone, Barr began moonlighting as a pilot with the Isthmian Airways out of Balboa, Canal Zone. Founded in 1929, Isthmian Airways operated a fleet of Hamilton H-47 seaplanes for special charter flights to Central and South America. With only two full-time civilian pilots in its employ, Isthmian Airways frequently turned to Panama-based US military aviators like Barr to run many of its charter flights.

At Isthmian, Barr earned a reputation for his daring and taking on some of the most hazardous missions. He once volunteered to transport repair gear and radio parts to a damaged light house in a tropical storm. Months later he embarked on a night flight from Panama to Costa Rica, landing on an unlit air strip in the mountains to evacuate a wounded soldier. Before flying him to safety, Barr performed an emergency cricothyroidotomy using only a pocket knife.

Barr hooks up an aviator with a transmitter prior to take-off, 1954.

For his lifesaving actions, Barr was awarded a letter of commendation from the U.S. Army Chief of Staff.

The emergency surgery foretold a new chapter in Barr's life and in the early 1930s he left the Army and Isthmian Airways to study medicine at Georgetown University. In July 1938, he obtained his commission in the Navy Medical Corps. Following postgraduate work at the Naval Medical School in Washington, D.C., Barr completed flight surgeon training at the Army Air Corps School of Aviation Medicine in Randolph Field, Texas and at the Naval School of Aviation Medicine (SAM) in Pensacola, Fla. After qualifying as a Navy pilot in 1942, Barr earned the distinction as the only naval officer authorized to wear five different military aviation wings—Army Air Corps Observer, Army Air Corps Pilot, Army Air Corps Flight Surgeon, Navy Flight Surgeon and Naval Aviator!

For much of World War II, Barr found himself serving as a flight surgeon aboard aircraft carriers USS Wasp, USS Shangri-La, and USS Antietam and at various Naval Air Stations. After the war, he reported to the Bureau of Medicine and Surgery (BUMED) to oversee the Aviation Division's Special Activities Branch. Among the projects Barr helped initiate was Project RAM (Research in Aerospace Medicine), a joint BUMED-Bureau of Aeronautics (BuAer) program with the objective to develop a biotelemetry system to track a pilot's physiological data in flight.

As part of this effort, Barr established a flying laboratory aboard an R4D transport plane that was equipped to receive, record, and evaluate physiological data and transmit it to the ground through radio transmission.

In February 1949, Barr used his aerial lab to monitor the heart rates of patients at a hospital in Greece and relay this data to an aircraft carrier off of Port Lyautey, Morocco. The data was then transmitted into a naval communications system picked up in Washington, D.C. and then conveyed by telephone to the National Naval Medical Center in Bethesda, Md.

Four years later, using ultra-high frequency radio equipment, Barr used his flying laboratory to capture physiological data of a jet pilot flying at an altitude of 52,000 feet and then transmitting it to a ground station at Anacostia, D.C.

In addition to monitoring the pilot, tracking oxygen supplies and pressurization schedules, heart rates, and breathing rates the data also enabled Barr to study the pilot's reaction time, body stress and strain under vigorous flying conditions. Barr noted in a 1954 article that the project marked the first time in aviation history that "a physician on the ground has been able to conduct a physical examination of a pilot in the air."

Until retiring in 1959, Barr continued to serve as the Navy's lead for the biotelemetry project and would oversee its application in the high-altitude manned balloon project. These contributions to medical science were foundational. And this very system was later utilized by NASA to monitor the vital signs of astronauts in the first manned spaceflights.

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SCOPE NEWS

A closer look at Navy Medicine's R&D enterprise

KUALA LUMPUR, Malaysia (Feb. 24, 2022) Capt. Jonathan Stahl, commanding officer, Naval Medical Research Center—Asia signs-in at the Malaysian Institute for Medical Research during an event discussing potential collaborative research . — CDR Andrew Letizia

SILVER SPRING, Md. (Feb. 11, 2022) Neda Acheampong, a researcher with Naval Medical Research Center dissects mosquitoes under a microscope in the General Immunology and Parasitology Laboratory to obtain malaria parasites.— *Mike Wilson*

LIMA, Peru (Feb. 11, 2022) Chief Master-at-Arms Jack Coon, attached to Naval Medical Research Unit—Six does plank exercises during command physical training. — *Hospital Corpsman 2nd Class Jessica Becht*

SIGONELLA, Italy (Feb. 24, 2022) Senior Chief Personnel Specialist Dwayne Smith, senior enlisted leader of Naval Medical Research Unit–Three reenlists in the Navy.— *LCDR Stephen Eggan*

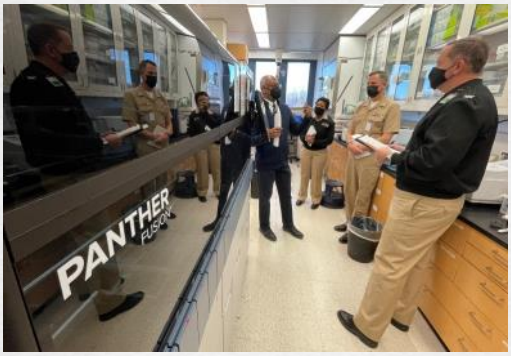
SINGAPORE (March. 8, 2022) Naval Medical Research Center—Asia, along with Singapore Area Coordinator (SAC) joint diversity, equity and inclusion committee hosted an International Women's Day luncheon and panel discussion. Lt. Jodi Fiorenzano of NAMRU-2 was a planner and coordinator for the event. — *SAC Public Affairs*

GROTON, Conn. (March 10. 2022) John Conners, deputy department head of Naval Submarine Medical Research Laboratory's Diving Research Department received the command's Junior Civilian of the Year award form commanding officer Capt. Katharine Shobe. — *Erica Casper*

DAYTON, Ohio (March 24, 2022) Naval Medical Research Unit-Dayton hosts Medical Inspector General, Capt. Trent Outhouse (standing) during a scheduled visit to assess the command's performance.
— *Justin Hayward*

SAN ANTONIO (March 22, 2022) Todd Jackson, security officer of Naval Medical Research Unit (NAMRU) San Antonio, briefs during an All Hands Meeting regarding Operations Security (OPSEC) at the Fort Sam Houston Golf Clubhouse. — *Burrell Parmer*

SAN ANTONIO – (March 7, 2022) Capt. Gerald DeLong, commanding officer of Naval Medical Research Unit (NAMRU) San Antonio with retired Rear Adm. Anatolio Cruz III (member of King Rey Feo's Court) at the annual Military Ambassadors Reception held at The Witte Museum. The event was hosted by the Military-Civilian Club of San Antonio. Keynote speakers included Commander of Air Force Education and Training Command Lt. Gen. Marshall Webb, USAA CEO Wayne Peacock, King San Antonio XCIX Barton Simpson, and King Rey Feo LXXIII Augustine Cortez Jr. Military Ambassadors represent their service at events throughout the local community with San Antonio's Fiesta being the highlight of the program. The Military Ambassador Program promotes the military's commitment and relationship with the local communities around the Installation. — *Burrell Parmer*



SILVER SPRING, Md. (Jan. 11, 2022) - Dr. Kevin Porter, director, Infectious Disease Directorate, Naval Medical Research Center (NMRC) briefs Capt. Trent Outhouse, Medical Inspector General, U.S. Navy Bureau of Medicine and Surgery, about the capabilities of the Naval Infectious Diseases Diagnostic Laboratory (NIDDL). — *Mike Wilson*

LIMA, Peru (March 5, 2022) Capt. Franca Jones, (center) commanding officer, Naval Medical Research Unit – Six poses with the Antonio Alarco Espinosa Volunteer Fire Company No. 60 during the company's 50th anniversary event.— *Roberto Cosio*

CAMP LEMONNIER, Djibouti (March 1, 2022) Cmdr. Nehkonti Adams, Naval Medical Research Center infectious diseases directorate deputy director, speaks at the Military Tropical Medicine Course. Medical leaders were invited to impart their knowledge about infectious diseases pertaining to East African tropical climates. — *Spc. Kiersten Breunig*

LIMA, Peru (March 1, 2022) Capt. Franca Jones, CDR Mike Prouty and LCDR Ryan Larson of Naval Medical Research Unit—Six conducted a site visit to Joint Task Force-Bravo, Soto Cano Air Base, Honduras, to enhance collaborations on infectious disease surveillance activities. — *Sgt. Maj. Hoskins*

SCOPE

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