



NAVAL MEDICAL

R&D

NEWS

December 2017

Volume IX

Issue 12



**NMRC RESEARCHERS RETURN
HOME FROM COMFORT
DEPLOYMENT**



Navy Medicine West Visits NMRC (COVER)

From Naval Medical Research Center Public Affairs

SILVER SPRING, Md. – Rear Adm. Paul Pearigen, commander, Navy Medicine West (NMW) and Chief of the Navy Medical Corps visited the Naval Medical Research Center (NMRC) to tour facilities, meet with staff, and learn more about the NMRC’s research endeavors to support warfighter health and readiness, November 27.

NMW has oversight of NMRC, headquarters for the Navy Medicine Research and Development enterprise.

“Coming here, meeting the men and women making contributions to the readiness of our warfighters was a very valuable and rewarding experience,” said Pearigen. “The work being done here is important, exciting and challenging.” He added, “The research that goes on in this building and throughout Navy Medicine’s R&D research facilities in the U.S. and around the world greatly contributes to our nation’s warfighters, our defense, and our safety.”

Pearigen toured the Directorate for Administration, the Advanced Medical Development Directorate, the Operational and Undersea Medicine Directorate, the Infectious Diseases Directorate, and he learned about the value of the DoD Bone Marrow registry and the program’s bone marrow donor drives. Pearigen also toured the NMRC Clinical Trials Center, located at the Walter Reed National Military Medical Center, Bethesda, Maryland.

In addition to operating as an independent laboratory within the Navy Medicine Research and Development enterprise, NMRC functions as headquarters for seven other Navy Medicine biomedical research laboratories: Naval Health Research Center, San Diego, California; Naval Medical Research Unit – San Antonio, San Antonio, Texas; Naval Medical Research Unit – Dayton, Dayton, Ohio; Naval Submarine Medical Research Laboratory, Groton, Connecticut; Naval Medical Research Center – Asia, Singapore; U.S. Naval Medical Research Unit No. 6, Lima, Peru, and U.S. Naval Medical Research Unit No. 3, Cairo, Egypt.

During an All Hands call after the tour, Pearigen said, “To the men and women here in uniform, I want to say I recognize that you are all in various stages of your military and scientific careers. There is so much ahead of you that you haven’t even dreamed of, and I am honored you chose to do it in uniform. Your contributions not only benefit the warfighter, but have the potential to benefit humanity as a whole.”

NMRC’s eight laboratories are engaged in a broad spectrum of activity from basic science in the laboratory to field studies at sites in austere and remote areas of the world to operational environments. In support of the Navy, Marine Corps, and joint U.S. warfighters, researchers study infectious diseases; biological warfare detection and defense; combat casualty care; environmental health concerns....(cont.)

Read More

NMRC Researchers Return Home (FEATURE)

From Naval Medical Research Center Public Affairs

SILVER SPRING, Md. – Two researchers from the Naval Medical Research Center (NMRC) returned from deployment on the Military Sealift Command hospital ship, the USNS Comfort (T-AH-20). Comfort departed Naval Station Norfolk, Virginia, September 29, arrived in Puerto Rico October 3 and returned to its home port November 20.

Cmdr. Ramiro Gutierrez and Cmdr. Matthew Bradley were aboard the Comfort for almost two months providing disaster relief support after Hurricane Maria devastated the island of Puerto Rico.

“To see hundreds of people come together and essentially build a hospital ship as we were steaming into the unknown is something only we, the U.S. Navy, can do and it’s a really powerful thing. On the island, there were people without electricity, food, water...and then we arrived to provide support, help and literally...comfort,” said Gutierrez.

Gutierrez, an infectious disease clinician and Department Head of the Enteric Diseases Department under the Infectious Disease Directorate, and Bradley, a trauma surgeon and Department Head of the Regenerative Medicine Department under the Operational and Undersea Medicine Directorate, spoke about their experience during an NMRC All-Hands call, November 27.

“Our mission, as I understood it, was basically to provide relief to the local hospitals and to provide for anyone who was in need. We saw a lot of antibiotic resistant infectious diseases from patients who had spent time in local critical care units before the hurricane made landfall. I spent a lot of time working with surgeons to identify infections and more...our main goal was to provide the best support and care to everyone who came or was brought to the ship...everyone,” said Gutierrez.

“As a trauma surgeon this was never a deployment I expected to be on, but helping people and providing relief was a very humbling and rewarding experience,” said Bradley.

“We are very proud of the work they did, they represent Navy Medicine research and development in an outstanding light and show the caliber of people we have in our research community. They never forget that they are sailors at heart with a dedication to service that cannot be extinguished,” said Capt. Adam Armstrong, commanding officer, NMRC.

During the All-Hands call, Rear Adm. Paul Pearigen, commander, Navy Medicine West and Chief of the Navy Medicine Corps spoke of the work Gutierrez and Bradley did on the deployment. “The people you cared for, their families, they needed help and someone to care for them with compassion and understanding – and that’s what you did. Thank you for heeding the call of this deployment; you have my appreciation for your dedication, care, and hard work.” ...(cont.)

Read More

NAMRU-6 PRESENTS ON DISTINGUISHING ZIKA VIRUS FROM OTHER ARBOVIRAL

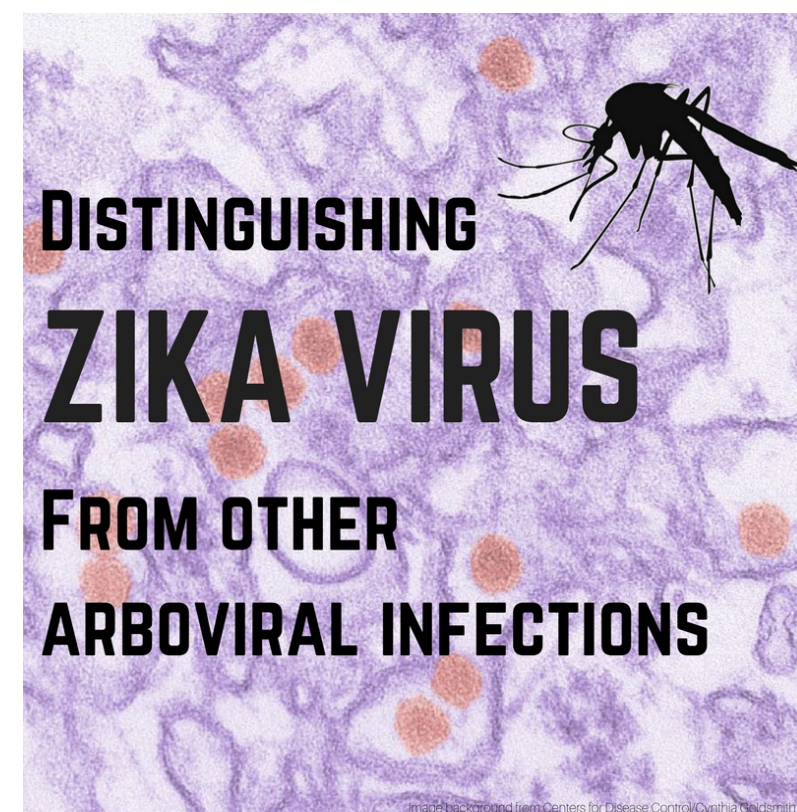
From Naval Medical Research Center Public Affairs

BALTIMORE – Researchers from the U.S. Naval Medical Research Center No. 6 in Lima, Peru, (NAMRU-6) shared findings on distinguishing Zika virus infections from other arboviral infections through a clinic-based febrile surveillance program during a time of active Zika circulation. The findings were presented at the American Society of Tropical Medicine and Hygiene Annual Meeting, November 7.

Arboviral infections are caused by a group of viruses spread to people by the bite of infected insects, like mosquitoes.

NAMRU-6 has been conducting acute febrile surveillance in civilian and military populations in Latin America for more than 25 years, according to Capt. Nimfa Teneza-Mora, executive officer, NAMRU-6.

“In Iquitos, the largest city in the Amazonian region of Peru, several arboviruses, including dengue, chikungunya, and Venezuelan equine encephalitis, Mayaro, and Zika circulate,” said Teneza-Mora.



NAMRU-6 established a local laboratory in Iquitos with a field team of researchers, physicians and laboratory technicians to determine the characteristics of acute febrile illnesses within the region. Among many findings of emerging and re-emerging diseases, the NAMRU-6 team identified the first Zika case and the Peruvian Ministry of Health (PMOH) provided laboratory confirmation.

“Distinguishing Zika virus cases from other arboviral infections is challenging and additional investigations into clinical diagnostics are needed. To date, the clinical presentation of Zika has not been completely described,” said Lt. Sarah Jenkins, Head, Vector Borne and Zoonotic Disease Unit.

From May 2016 – January 2017, over 690 febrile patients were enrolled in the study and 48 patients were confirmed to have Zika virus infection. Rash was the most common symptom, followed by muscle ache, and joint pain mostly in the hands and knees. According to Jenkins, to date, no cases of microcephaly or other neurological disorders, hemorrhagic manifestations, or deaths have been reported in Peru as a direct cause from Zika.

Although mild in most people, Zika virus infection can present a great risk to fetuses if mothers are infected during pregnancy....(cont.)

[Read More](#)

NMRC-A SHARES IMPORTANCE OF NEW CLINICAL RESEARCH CENTER IN MALAYSIA

From Naval Medical Research Center - Asia Public Affairs

SINGAPORE – A Naval Medical Research Center – Asia (NMRC-A) researcher attended the opening ceremony of Segi University Clinical Research Center at Sibu Hospital, Sibu, Malaysia, October 11.

“Research directed towards the early detection of acute novel respiratory viruses is of particular interest to the military because emerging respiratory viruses are not only a hazard to individuals living in Southeast Asia, but they also threaten the health of U.S. military members and government personnel working in the region,” said Lt. Cmdr. Tupur Husain, who attended the meeting, a microbiologist and Department Head of Research Support, NMRC-A.

He continued, “This research center will provide a means to improve the region’s diagnostic and research



capabilities, especially when it comes to novel respiratory infections, which have caused considerable morbidity and mortality across the region.”...(cont.)

[Read More](#)

NBPL CO GETS FIRSTHAND LOOK AT NAVY MEDICINE RESEARCH LAB

From Naval Health Research Center Public Affairs

SAN DIEGO – Capt. Brien Dickson, Naval Base Point Loma (NBPL) commanding officer, visited the Naval Health Research Center (NHRC) to learn more about the command’s mission and tour the facilities, November 30.

NHRC, which is a tenant command of NBPL, optimizes the operational readiness and health of U.S. warfighters by conducting research, development, testing, and evaluation.

NBPL provides infrastructure, security, recreational, and galley support, ensuring its tenant commands have everything they need to perform their mission....(cont.)



[Read More](#)

NAMRU-3 AND CAMP LEMONNIER TEAM UP FOR WARFIGHTER HEALTH, READINESS AND PROTECTION

From U.S. Naval Medical Research Unit No. 3 - Cairo Public Affairs



CAIRO, Egypt – Researchers from the U.S. Naval Medical Research Unit No.3 – Cairo (NAMRU-3), working with the a team from Camp Lemonnier, are set to begin a collaborative research study focusing on the prevalence of a variety of potential infectious diseases at Camp Lemonnier, Djibouti, Africa, February 2018.

The data collected from the study will help provide AFRICOM and Camp Lemonnier leadership the necessary tools to better understand specific disease threats by location and season, which allows for the opportunity for leadership to make informed decisions regarding risk mitigation.

Over the next few years, the researchers plan to

track data gathered through serological analysis of samples to test for seven vector-borne and respiratory pathogens: Zika Virus, Dengue Virus, Chikungunya Virus, West Nile Virus, Malaria, Rift Valley Fever and MERS-CoV.

“There is little data on the pathogens deployed service members face in this region. One of our goals for this study is to identify respiratory pathogens personnel are exposed to and then provide research solutions to mitigate those threats,” said Lt. Jose Garcia-Rivera, Department Head, Viral and Zoonotic Disease Research and Principle Investigator on the Camp Lemonnier study.

The samples will come from troops stationed at Camp Lemonnier throughout the duration of their deployment as well as personnel forward deployed throughout the AFRICOM area of responsibility.

“Our surveillance activities provide critical information to medical personnel at Camp Lemonnier and the associated drug resistance profiles of pathogens causing disease among deployed service members,” said Lt. Cmdr. Michael Gregory, Department Head, Bacterial and Parasitic Disease Research Department.

The study is funded by the Global Emerging Infections Surveillance section of the Armed Forces Health Surveillance Branch of the Defense Health Agency and provides researchers the opportunity to study the clinical features and risk factors of febrile and respiratory etiologies.

“I feel we will gain valuable insight from this study into what type of viral pathogens forward deployed service members are exposed to in this region,” said Garcia-Rivera....(cont.)

[Read More](#)

NAMRU-SA RESEARCH DENTIST INSPIRES STEM INTEREST AT MIDDLE SCHOOL CAREER DAY

From Naval Medical Research Unit - San Antonio Public Affairs

SAN ANTONIO – A Naval Medical Research Unit – San Antonio dentist attended Career Day at a local San Antonio middle school, November 17.

The Joel C. Harris Academy in San Antonio welcomed Lt Cmdr. Jeffrey Hoyle, a research dentist, back for an encore presentation for their annual event. Hoyle presented to almost 100 sixth graders across four classes.

“This is my second Career Day at Harris Academy, and it’s a great experience every time,” said Hoyle. “The students are at a great age. They’re energetic, curious, and thinking about their future. They ask honest and thoughtful questions and soak up every answer.”

Hoyle sparked students’ interest in science, technology, engineering, and mathematics, or STEM, through dentistry with an engaging presentation, videos of life on a Navy ship, and a hands-on demonstration to introduce the students to career paths in Navy Medicine.

Hoyle had their attention locked-in from the moment he showed slides from a recent deployment, which included photos of life on a Navy ship and dental operations at sea. He also presented age-appropriate clinical photographs of oral trauma and disease, asking the students to be ‘doctors’ and diagnose what they see.

“The pathology slides always get a strong reaction, a mix of cheering and groans. The students love it,” said Hoyle.

Part of Hoyle’s presentation included using a polyvinylsiloxane putty to demonstrate polymerization chemistry in a dental impression material used for crowns, implants, partial dentures, and other applications. He also showed them custom surgical loupes, personal protective equipment, operative and surgical instruments, restorative materials, and lab equipment.

“The students had a great time with the impression material,” said Hoyle. “They could directly relate the demonstration to an experience at the dentist, but now had a better understanding of the material science.”

“I talked to them about what it takes to become a Navy dentist and explained the career path from high school to college and dental school,” said Hoyle. “I told them, for the best opportunities to do interesting work like this, you need to get serious about your grades the day you start high school.”...(cont.)



[Read More](#)

THE LITTLE LAB THAT COULD

Story Courtesy Future Forces Magazine Fall 2017 Edition

By. Capt Marshall Monteville, Commanding Officer, NHRC

With an initial budget of \$30,000 from the Navy's Bureau of Medicine and Surgery, furniture and office equipment supplied from a nearby Navy confinement facility, and a mission "to conduct research in neuropsychiatry as it applies to naval service," the Naval Health Research Center (NHRC) was commissioned, 1 June 1959.

Originally named the Navy Medical Neuropsychiatric Research Unit (NMNPRU), one of the command's first assignments was to conduct research in support of screening scientists and support personnel for Operation Deep Freeze, a joint scientific research effort in the Antarctic, supported by the Navy and directed by the National Science Foundation. Dr. Eric Gunderson, who would eventually become one of NHRC's scientific directors, conducted a series of psychological studies on Deep Freeze personnel, enabling him to successfully develop predictors for prospective candidates who would adjust well to Antarctica's challenging environment.

Another major focus of NHRC's early research was the study of the psychological aspects of sleep and its impact on performance. These studies were led by Dr. Laverne Johnson, who also would go on to become scientific director at NHRC and a noted sleep research pioneer.

Over the next decade and a half, NHRC's mission evolved and expanded. By 1974, NMNPRU had been renamed the Naval Health Research Center in recognition of the broader scope of its research programs. The command's new mission was "to conduct research and development on the medical and psychological aspects of health and performance of naval service personnel."

The year 1974 also saw the launch of the Center for Prisoner of War Studies at NHRC, now located in Pensacola, Florida...(cont.)

[Read More](#)

THE KRAKEN™ GOES TO BATTLE AGAINST SPATIAL DISORIENTATION

Story Courtesy Future Forces Magazine Fall 2017 Edition



By. Capt. Richard Rich Folga, USN

The Disorientation Research Device (DRD), otherwise known by its official Navy-branded moniker, the Kraken™, is the Navy's newest weapon in the battle against a long-standing noncombat threat to aviators and aircrews: spatial disorientation (SD). The DRD was created to provide unprecedented research capability to address this persistent threat. By replicating acceleration forces experienced in flight and integrating high-fidelity flight or other vehicular displays, the DRD can produce dynamic conditions under sustained G forces (up to 3G) with man-in-the-loop control of motion with authentic sensory stimulation. During these conditions, researchers can measure actual sensory spatial reflexes and monitor subject physiologic parameters. Other research applications for the DRD include study of all forms of motion sickness, human systems integration validation of helmet mounted displays, specify areas of neural activation during dynamic motion, developmental life support equipment test and evaluation, recreation of aircraft mishaps and dynamic effects of hypoxia on performance.

As the program manager for the Kraken™, I am charged with developing this unique capability into an SD research and countermeasure test bed, targeting the most persistent aeromedical cause of fatal aircraft mishaps, one that strikes across platforms and services. The Kraken™ is housed and operated in the Naval Aerospace Medical Research Lab (NAMRL) at Naval Medical Research Unit-Dayton.

After accepting the \$19-million device from the contractor in October 2016, our team of engineers, mathematicians, and technicians is pulling together to complete a long list of crucial tasks for development of this long-awaited, one-of-a-kind multi-axis acceleration research platform. No other research capability like the Kraken™ exists in the United States.

[Read More](#)

MODERN TOOLS FOR MODERN MEDICAL PLANNING

Story Courtesy Future Forces Magazine Fall 2017 Edition



By Michael Galarneau, Director, Operational Readiness and Health, NHRC

The concept of medical planning is not new. Throughout the Civil War, Clara Barton collected and delivered wagon loads of bandages and other medical supplies to U.S. Army doctors caring for wounded Union soldiers. Barton, a trailblazer in combat care, also tended to the wounded on battlefields and prepared them for evacuation.

By World War II, most medical planning was done using field manuals, which depended on “rules of thumb” and lookup tables to predict casualties. This process was an improvement on earlier methods and relied on mathematical formulae to predict casualty counts based on the population at risk, offensive/defensive posture, and a planner’s estimate of an appropriate casualty rate based on the anticipated operation.

There were many problems with planning this way. Results were inconsistent and couldn’t always be replicated, which meant that two separate planners could (and frequently did) obtain widely different estimates on the number of casualties. In addition, this methodology wasn’t transparent—it hindered planners’ ability to communicate with others about how they arrived at their estimates, and the lack of documentation prevented consistent reconstruction of the estimation process.

Aside from these drawbacks, there was one other problem: this method of medical planning only took into account the estimated number of casualties and didn’t include an estimate of the resources that would be required to care for those casualties. Until recently, this was how medical planners prepared for war....(cont.)

[Read More](#)

R&D CHRONICLES: THE NAVY’S PLIGHT AGAINST THE TYPHOID MENACE

By André B. Sobocinski, Historian, BUMED

“Experience has demonstrated that the naval personnel even on shipboard is not entirely safe from food and water borne infection. . .”

~Surgeon General of the Navy Annual Report, 1908

After a century of advances in public health, water treatment, vaccine research and the advent of antibiotics, typhoid fever is far from the threat to the Navy it once was.

Several generations ago this narrative was quite different.

Between 1900 and 1910 typhoid accounted for over 1,300 hospital admissions and some 100



deaths in the Navy. In 1910 alone, there were 221 documented cases of typhoid in the service resulting in over 10,000 sick days. The very same year the battleship USS Connecticut was so overrun with “the fever” it was forced to abandon operations with its squadron.

For many, this archaic disease will forever be associated with an Irish immigrant branded by newspapers as the notorious “Typhoid Mary.” Mary Mallon had for years served as a household domestic to a host of wealthy families in New York. In addition to providing cleaning and laundry services, Mallon was known for preparing a special dish, home-made peach ice cream. But little did her patrons know this delicacy came with an added dollop of disease. As sanitation engineer George Soper would discover in 1907, Mary Mallon was a carrier of typhoid fever.

Like other enteric diseases typhoid is primarily transmitted by ingesting contaminated food or water containing harmful bacteria, specifically Salmonella Typhi. When typhoid manifests symptoms can include high fever, fatigue, stomach pains, skin rashes and loss of appetite; in the most severe cases internal bleeding—even death—will ensue.

Typhoid was certainly no mystery to the Navy Medical Department in the early 1900s. The typhoid germ had first been identified by bacteriologists in the 1880s and tied to poor hygiene and sanitary conditions. Across the fleet, Navy physicians tried to safeguard crews by implementing sanitary measures like purification of drinking water, food inspection, regular cleaning of lavatories and kitchens, and instituting good hygiene practices (e.g., washing one’s hands, etc).

But sanitation alone was not a full-proof safeguard against typhoid; and Navy Medicine sought new means for eradicating the menace, namely through vaccination....(cont.)

[Read More](#)

NAVAL MEDICAL RESEARCH CENTER HIGHLIGHTS



Rear Adm. Paul Pearigen, commander, Navy Medicine West and Chief of the Navy Medical Corps (left) stands with Hospital Corpsman First Class Nicole Mattera (center) and Capt. Adam Armstrong (right), commanding officer, Naval Medical Research Center, during her frocking ceremony from Hospital Corpsman Second Class to Hospital Corpsman First Class, November 27.

(U.S. Navy Photo/Released/Katherine Berland)



Cmdr. Michael Cassady (left), Director of Acquisition, Program Management and Research Support Services, Navy Advanced Medical Development Department, Naval Medical Research Center, pictured with Rear Adm. Paul Pearigen (right), commander, Navy Medicine West and Chief of the Navy Medical Corps, receives a Meritorious Service Medal in lieu of the second award, November 27.

(U.S. Navy Photo/Released/Katherine Berland)

Lt. Brian Morrison, microbiologist, Viral and Rickettsial Diseases Department, Infectious Diseases Directorate, pictured with Capt. Adam Armstrong, commanding officer, Naval Medical Research Center, receives the Navy and Marine Corps Achievement Medal Gold Star, November 27.

(U.S. Navy Photo/Released/Katherine Berland)



Hospital Corpsman Second Class Diamante Moon (left), pictured with Capt. Adam Armstrong (right), commanding officer, Naval Medical Research Center, receives the Navy and Marine Corps Achievement Medal Gold Star in lieu of the fourth award, November 27.

(U.S. Navy Photo/Released/Katherine Berland)



NAVAL MEDICAL RESEARCH CENTER HIGHLIGHTS



Each year, every Navy ship, station and command around the world chooses its Sailor of the Year based on leadership, professionalism, dedication, and superior performance. Hospital Corpsman First Class Karen Graydon (right) and Hospital Corpsman First Class Nicole Mattera (left) have been selected as the Naval Medical Research Center's Senior Sailor and Junior Sailor of the Year for 2017. An update on their competition for the Research and Development Enterprise Sailor of the Year and Navy Medicine West's Regional Sailor of the Year will follow in 2018.

(U.S. Navy Photo/Released/Katherine Berland)



Yeoman Seaman Apprentice Reniisha McClinton (left) receives a Flag Letter of Commendation for earning the Naval Medical Research Center (NMRC) Bluejacket of the quarter for FY17 third quarter from Cmdr. Michael Cassady (right), acting commanding officer, NMRC, November 6.

(U.S. Navy Photo/Released/ENS Katrina Brewer)

NAVY MEDICINE R&D ENTERPRISE COMMAND



Capt. Adam Armstrong
Commanding Officer
Medical Corps, USN



Capt. William Deniston
Executive Officer
Medical Service Corps, USN

This newsletter is a publication of the Naval Medical Research Center, 503 Robert Grant Ave, Silver Spring, Maryland. 20910-7500. The electronic newsletter is published monthly by the Naval Medical Research Center Public Affairs office. For questions or information contact the Public Affairs Officer at 301-319-9378 or usn.nmrc.pao@mail.mil

Commanding Officer
CAPT Adam Armstrong

Executive Officer
CAPT William Deniston

Director for Administration
Steven S. Legette