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## 100,000 and Counting - Navy Medicine Research Team Provides Ebola Confirmatory Tests to West Africa

*By Doris Ryan, Public Affairs Officer, Naval Medical Research Center Public Affairs*



*After a large batch of Ebola specific PCR (Polymerase Chain Reaction) master mix is produced under ISO accredited standards, the mix is aliquoted into individual tubes. These reagents are tested under a strict quality assurance plan before shipping to qualified laboratories for detection of the Ebola virus. (Photo courtesy of NMRC Public Affairs)*

SILVER SPRING, Md. – The Naval Medical Research Center (NMRC) has been supporting DoD’s interagency efforts since the early months of the Ebola outbreak, which began in December 2013, when initial cases were reported in Guinea and later spread to Sierra Leone and Liberia.

A research team from NMRC’s Biological Defense Research Directorate (BDRD) has been busy producing more than 100,000 Ebola detection assays for the Medical Countermeasure System’s Critical

Reagents Program, a part of the DoD Joint Project Management Office.

“We were tasked to produce assays when the outbreak began and as the crisis continues to worsen, our production tempo has increased dramatically. Our team is producing these assays every day,” said Dr. Joan Gebhardt, head of Molecular Diagnostics at BDRD.

As part of its mission, BDRD produces reagents and detection assays

*(continued on page 3)*

### NMRC Commanding Officer's Message



There is never an end to the activity in Navy Medicine R&D and the "front page" news for the last several weeks is the Ebola Virus in west Africa and our two mobile labs in country are getting a lot of media attention.

There is also a lot going on behind the scenes. We recently held an enterprise leadership meeting to discuss the current state of Navy Medicine R&D and to begin to work through issues common to all of us. The meeting was a great success.

The Commanding Officers of each of the eight research commands, ably supported by their XO's and Science Directors, came together as a Board of Directors for the research enterprise to review our accomplishments and challenges. Each lab CO briefed on their accomplishments and I must say every CO demonstrated their pride when discussing their command. There were issues raised concerning processes that could be improved or areas needing to be strengthened to improve our effectiveness as a research enterprise including science support activities such as manpower management, support agreements, measurement of laboratory metrics, and of course, financial management and audit readiness.

I can't say that we resolved all the issues raised, but I do want to assure you the commands' leaders were not bashful about identifying areas needing to be improved and were also not hesitant to commit to working together to make those improvements. There was also a commitment to make sure the commands are more purposeful in working together collaboratively in research areas that stretch across the missions of multiple commands such as infectious disease prevention or fatigue mitigation. We are maintaining our commitment to improving our processes and working together more effectively as an enterprise.

There are several "due outs" working through both administrative and science chains now that will be reported back to the Board of Directors when we meet again in the Spring. I am grateful for everyone's dedication to accomplishing our shared mission and look forward to our continued progress together.

NMRC Commanding Officer sends,  
John. W. Sanders III, CAPT, MC, USN

### NHRC Commanding Officer's Message

Soon, our Millennium Cohort and Millennium Cohort Family Study teams will begin a herculean research survey effort that to this day, remains the largest longitudinal study in military history.

I'm proud to introduce Dr. David Luxton to the Navy Medicine R&D enterprise, and to all of our collaborators across the country, as the study's new principal investigator. Dr. Luxton is a clinical psychologist, Air Force veteran and renowned researcher. He comes to us from the Defense Center of Excellence National Center for Telehealth and Technology with expertise in military psychological health and suicide risk and prevention.

With the natural drawdown of forces after two long wars, collaborative research efforts between NHRC and the Department of Veterans Affairs are crucial. Continuing to expand upon this relationship will truly enable us to examine the long-term health effects of military unique exposures on our men and women in uniform.

Equally as important, it enables us to continue this comprehensive study well beyond their time on active duty. I look forward to watching the dedication of our Millennium Cohort and Millennium Cohort Family Study teams unfold as they focus on their next survey cycle to more than 200,000 military members. Concurrently, our expert teams around the command continue to produce innovative and impactful research and program execution. Some of our newest initiatives as we head into the new fiscal year include: a study examining the use and safety of supplements by service members, research on genetic and environmental factors on stress, a project studying intervention methods aimed at reducing recovery time and attrition among injured Marine recruits and a new collaboration designed to identify optimal methods for routine suicide screening in primary care settings.

As funding streams face reductions and budgets are threatened, our mission is paramount. Every study we conduct, every program we create, every new collaboration we establish, our mission is clear and our work is critical to the operational health and readiness of our armed forces.

NHRC Commanding Officer sends,  
Jacqueline Rychnovsky, CAPT, NC, USN



(continued from page 1)

for research and development in the DoD, U.S. agencies and other partners. These Ebola-specific assays are used in west Africa.

Blood samples are being collected from patients exhibiting symptoms and tested to detect infection. These assays are used to confirm patients with probable or suspected Ebola virus disease so they can be moved to treatment centers; the assays are also used for screening potential contacts of infected individuals.

"This effort is a great example of what BDRD is capable of, quick rapid turnaround to provide detection assays for emerging infectious diseases anywhere on the globe," said Cmdr. Guillermo Pimentel, Deputy Director of BDRD.

According to the Centers for Disease Control and Prevention's (CDC) website the first Ebola virus species was discovered in 1976 in what is now the Democratic Republic of the Congo near the Ebola River.

Since then, outbreaks have appeared sporadically. Ebola virus disease is characterized by fever, severe diarrhea, vomiting and can present as a severe viral hemorrhagic fever, an often fatal disease.

The disease is often spread through families and friends because they come in close contact when caring for ill persons. The disease can also spread quickly within clinics or hospitals in resource poor settings with limited infection control capabilities.



Research Assistant Maria Granville of the BDRD Molecular Diagnostics Department places a master mix test plate into an ABI7500FastDx Instrument. All of the reagents produced by BDRD are thoroughly tested under strict ISO accredited standards to ensure performance before it is distributed to laboratory personnel in the field. (Photo courtesy of NMRC Public Affairs)

BDRD is focused on research and development to protect U.S. military personnel and civilians from the threat of infectious diseases and biological attacks.

The lab is certified as a National Laboratory within the CDC's Laboratory Response Network for biological hazard testing and analysis. In addition, the production labs for molecular and immunological assays are under International Organization for Standardization ISO Guide 34/17025 accreditation.

The research team supports Naval Sea Systems Command ensuring

Fleet protection, outfitting the Navy and Marine Corps with bioweapons defense field testing capabilities and managing the proficiency testing program for the Joint Biological Agent and Identification and Detection System platform.

Supporting the U.S. Government Health Security Agenda, the laboratory continues to expand their international research collaborations and programs.

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Graphic illustration by Mikelle D. Smith, Naval Medical Research Center Public Affairs

## DoD may Deploy up to 4,000 troops to combat Ebola

Story by Jim Garamone, DoD News, Defense Media Activity

FORT MEADE, Md., – The Defense Department may deploy up to 4,000 servicemembers to Liberia as part of Operation United Assistance against Ebola, Pentagon Press Secretary Navy Rear Adm. John Kirby told reporters at the Pentagon, Oct. 3.

“There are 205 U.S. servicemembers in Liberia today with another 26 in neighboring Senegal. All servicemembers are supporting the lead federal agency for American participation in the Ebola crisis.” ~ the U.S. Agency for International Development.

“[Defense Secretary Chuck Hagel] has approved the potential deployment of up to 4,000 [servicemembers],” said Kirby. “I want to make one thing real clear, that’s a potential deployment; it doesn’t mean it’s going to get to that number.”



Pentagon Press Secretary Navy Rear Adm. John Kirby describes the latest Defense Department efforts to help contain the Ebola crisis during a press briefing at the Pentagon, Oct. 3. (Photo taken by Glenn Fawcett)

### Testing Labs Operational

Operations are moving forward in Liberia. “Over the last 36 hours, two Ebola testing laboratories manned by personnel from the U.S. Naval Medical Research Center are now fully operational,” said Kirby. “The labs can process about 100 samples each day.

“U.S. personnel are also on track for completing a hospital for infected medical personnel on Oct. 18,” said Kirby. “Construction of two treatment centers for other Ebola victims will begin today and should be completed by the end of the month.”

Kirby forecast a significant increase in the operations tempo in Liberia and with it an increase in troops.

### Troop Deployments

The U.S. Army announced the units that will deploy to the region beginning in mid-month and running through November. With the previously announced unit deployments, this will bring the total Army commitment to about 3,200 soldiers.

More than 1,800 Fort Campbell, Kentucky-based soldiers will arrive in Liberia sometime late this month. Other soldiers will deploy from the 101st Sustainment Brigade, the 86th Combat Support Hospital of the 44th Medical Brigade, and a Military Police company from the 16th Military Police Brigade.

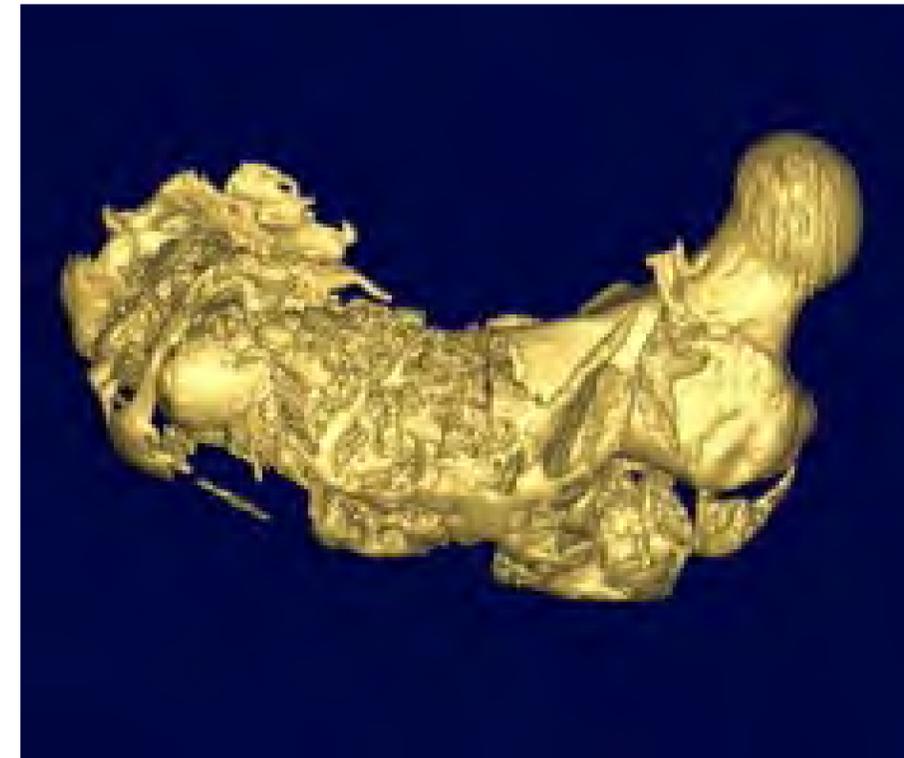
These units will provide medical and logistic support, as well as site security, to the Joint Task Force. Soldiers will deploy from other bases as well including, Fort Hood, Texas; Fort Carson, Colorado; Fort Bliss, Texas; Fort Bragg, North Carolina; Fort Stewart, Georgia; Fort Benning, Georgia; Fort Eustis, Virginia, and Aberdeen Proving Ground, Maryland.

### U.S. Government Response to Ebola Threat

“As we continue our support to the broader U.S. government response to the Ebola crisis, I want to emphasize that our operations remain focused on four lines of effort: command and control, logistics support, training, and engineering support,” said Kirby. “Troops going to the region will be monitored before, during and after deployment. Before they go, they are going to get trained on Ebola and what the disease is like, what it means [and] what it does. The troops that we’re sending are not health care professionals, doctors, nurses [or] corpsmen ... they are logisticians and engineers. Health experts will explain the best way to protect themselves from the disease. They will also explain the symptoms of Ebola. While the troops are there, they’re going to be constantly monitored on a regular, frequent basis.”

## Possible New Treatment Holds Promise for Blast Injured Personnel

Story by Sharon Holland, External Affairs, Uniformed Services University of the Health Sciences



Example of heterotopic ossification, (Photo courtesy of the Cmdr. Jonathan Forsberg)

Bethesda, Md. – A possible new treatment for stopping bone growth in soft tissue following third-degree burns may also prove to be beneficial to combat troops suffering high energy orthopedic trauma or blast injuries, according to an article in the September 24, 2014 edition of *Science Translational Medicine*.

Navy Cmdr. Jonathan Forsberg, associate professor of Surgery at the F. Edward Hebert School of Medicine, Uniformed Services University of the Health Sciences (USU), and head, Department of Regenerative Medicine at the Naval Medical Research Center, and his co-authors Dr. Tom Davis, scientific director, Department of Regenerative Medicine, Naval Medical Research Center; Dr. Eric Elster, professor and Chair, Norman M. Rich Department

of Surgery at USU; and Dr. Jeffrey M. Gimble, Center for Stem Cell Research and Regenerative Medicine, Tulane University School of Medicine, suggest that findings by a team of scientists led by Dr. Benjamin Levi at the University of Michigan, also reported in the same issue of *Science Translational Medicine*, could pave the way for improved methods to prevent heterotopic ossification, or bone formation in soft tissues, a significant complication in battlefield wounds.

Third degree burns, like combat injuries, can cause bone to form in soft tissues where it normally does not appear, creating major problems for patients and their surgeons. Levi’s team developed a mouse model to replicate the abnormal bone growth. The scientists then added a protein over the surface of the burn that

removes energy molecules from the environment.

The body’s cells normally release this energy molecule when exposed to trauma like a burn. The presence of the molecule outside the cell signals the cell to turn on its bone-forming machinery.

By removing this energy molecule from the environment, Levi’s team has shown that the cell’s bone-forming machinery is turned off and bone formation is substantially reduced. Forsberg and his co-authors believe the process could be applied to military orthopedic trauma patients, and suggest further exploration using a blast injury model that Forsberg’s lab has recently developed.

The frequency of HO formation from injuries sustained by improvised explosive devices and rocket propelled grenades in Operation Enduring Freedom and Operation Iraqi Freedom have been reported as high as 63 percent in the wounded warfighters.

“Combat-related HO represents a key clinical problem that’s emerged during the present conflicts– afflicting a higher percentage of combat-injured personnel than either traumatic brain injury or post-traumatic stress disorder. For many patients, combat-related HO represents a critical barrier; limiting return to duty or regaining functional independence,” said Forsberg. “The work by Dr. Levi’s research team and ours in the Regenerative Medicine Department at NMRC is designed to address these gaps through multi-faceted, multi-investigator, and multi-institutional collaborations.”



# Republic of Liberia

By Doris Ryan, Public Affairs Officer, Naval Medical Research Center Public Affairs

The Naval Medical Research Center's (NMRC) Biological Defense Research Directorate (BDRD) is charged with the research and development of ways to protect U.S. military personnel and civilians from the threat of infectious diseases and biological attacks. BDRD is a world leader in detection and confirmatory laboratory analysis of infectious disease agents of public health importance. BDRD developed the two mobile labs currently in Liberia in support of DoD's participation in Operation United Assistance. The mobile labs are rapidly deployable detection laboratories that incorporate immunological and molecular analysis techniques. The mobile labs optimize these technologies to rapidly detect infectious pathogens. The labs' detection capabilities will reduce the amount of time it takes to determine whether a patient has Ebola from several days to a few hours.



U.S. Navy Lt. Cmdr. Benjamin Espinosa meets Col. Sazzad, commander of the Bangladesh Contingent of the United Nations Military Forces in Liberia, Oct. 7. Espinosa is connected with the Naval Medical Research Center's mobile laboratories in Liberia. U.S. Army Africa. (Photo courtesy of U.S. Navy)



U.S. Navy Lt. James Regeimbal decontaminates and inspects sample documentation received at a Naval Medical Research Center mobile laboratory in Liberia, Oct. 7. (Photo taken by Chief Hospital Corpsman Jerrold Diederich, U.S. Army Africa)

U.S. Navy Lt. Andrea McCoy tests patient RNA (Ribonucleic Acid) samples for the Ebola virus at Naval Medical Research Center mobile laboratory on Bushrod Island, Liberia, Oct. 6. (Photo taken by Chief Hospital Corpsman Jerrold Diederich, U.S. Army Africa)



Hospital Corpsman First Class (FMF) Yusupha Kah, U.S. Navy, extracts RNA (Ribonucleic Acid) from patient samples. Extracted RNA will be analyzed by real time PCR (Polymerase Chain Reaction) to determine if the Ebola virus is present. (Photo taken by Chief Hospital Corpsman Jerrold Diederich)

U.S. Navy Lt. Jose Garcia inspects specimen labels and prepares for the first step in sample processing on a Naval Medical Research Center mobile laboratory on Bushrod Island, Liberia, Oct. 6. (Photo taken by Chief Hospital Corpsman Jerrold Diederich, U.S. Army Africa)



U.S. Navy Lt. Andrea McCoy reviews specimen documentation and records data in a laboratory log book at a Naval Medical Research Center mobile laboratory on Bushrod Island, Liberia, Oct. 6. (Photo taken by Chief Hospital Corpsman Jerrold Diederich, U.S. Army Africa)

Graphic illustration by Mikelle D. Smith, Naval Medical Research Center Public Affairs

## DOD's Largest Navy-led Study Endorsed by Army's Top Doc

Story by Anna Hancock, Public Affairs Officer, Naval Health Research Center Public Affairs



Image courtesy of Millennium Cohort Study website

SAN DIEGO - The Department of Defense's largest longitudinal study in military history received an endorsement from the Army's surgeon general emphasizing the importance of the Navy-led study across the military services, Sept. 19.

As Naval Health Research Center's (NHRC) Millennium Cohort Study (MilCo) team is gearing up to launch a monumental survey effort, they anticipate the endorsement letter from Army Surgeon General and Commanding General, Lt. Gen. Patricia D. Horoho, U.S. Army Medical Command, will help encourage and increase participation. This month, the team will launch the fiscal year 2014 survey effort to more than 200,000 service members.

"As a participant, the valuable information you provide will help the Millennium Cohort Study team, DoD, and Veterans Affairs understand the health concerns and needs of service members and veterans," wrote Horoho. "Your continued participation is critical."

The Millennium Cohort study regularly surveys active duty, veteran, retiree, and

military family members who volunteered to participate, some as far back as 2001 when the study was created.

The study was originally designed to follow participants for up to 21 years, but 21 years was recently extended to 67 years allowing the team to follow participants throughout their lifespan.

"We work jointly with the nation's leading experts from the Navy, Army, Air Force, Marine Corps, Coast Guard, and Department of Veterans Affairs, as well as our academic and private sector colleagues to execute our study," noted Dr. David Luxton, NHRC's principal investigator and clinical psychologist. "This endorsement solidifies our study's relationship with the Army."

MilCo and the MilCo Family Study, a similar research endeavor specifically geared toward military family members, are vital to comprehensively examining the effects of military-unique exposures, including deployments, on long-term health.

The team produced more than 200 findings accepted in peer-reviewed publications or conferences, many implemented in

the forms of policy changes, training programs or other evidence-based decision making by military leaders.

"The value our study has for our men and women in uniform, and their families, is immeasurable," NHRC's Commanding Officer Capt. Jacqueline Rychnovsky began. "We appreciate the support we received from Lt. Gen. Horoho, and the surgeons general from each of the services. It truly is a team effort."

As the DOD's premier deployment health research center, NHRC's cutting-edge research and development is used to optimize the operational health and readiness of the nation's armed forces.

Within close proximity to more than 95,000 uniformed service members, world-class universities, and industry partners, NHRC's expert team sets the standard in joint ventures, innovation and practical application.

For more information on The Millennium Cohort Study, visit [www.millenniumcohort.org](http://www.millenniumcohort.org) or <http://www.med.navy.mil/sites/nhrc/Pages/default.aspx>.

## Navy Study Confirms Vaccine Effectiveness in Recruits

Story by Anna Hancock, Public Affairs Officer, Naval Health Research Center Public Affairs



Seaman recruits perform physical training exercises in their berthing compartment at Recruit Training Command (RTC). Recruit divisions conduct various physical training exercises in order to build strength in preparation for their final training assessments and duty in the fleet. RTC is known as the Quarterdeck of the Navy and trains approximately 37,000 civilians into basically trained Sailors. (U.S. Navy photo taken by Mass Communication Specialist 1st Class Richard Perez)

SAN DIEGO -- A recent study led by the Naval Health Research Center (NHRC) confirmed the effectiveness of the adenovirus vaccine after observing a 100-fold decline in respiratory illnesses in U.S. military recruits.

The study, published in *Clinical Infectious Diseases* (CID), this summer, examined the impact on Navy, Marine Corps, Air Force, Coast Guard and Army recruits after the sole manufacturer ceased production for a 12-year period starting in 1996. Since the resumption of the vaccine in 2011, the study highlights the fact that the vaccine prevented an estimated three deaths and up to 8,100 hospitalizations within the military population.

"Febrile Respiratory Illnesses (FRI)

resulting from adenovirus were responsible for an estimated \$600 million in training time lost and medical expenses during the 12 years with no vaccines," explained Anthony Hawksworth, an analyst at NHRC and coauthor of the study. "Adenovirus, which causes flu-like symptoms and often leads to pneumonia, greatly impacted training during the non-vaccine period, disrupting training schedules and causing a significant number of recruits to drop out of the program."

Accounting for the cost of the vaccines, according to Hawksworth, NHRC estimates an annual savings of \$20 million since vaccine resumption.

For a recruit, basic training or "boot camp" is a vigorous six to 12 week

training program. It teaches the fundamentals of military service and trainees undergo rigorous physical fitness programs. Adenovirus is the most prevalent and most widely spread virus in military training environments – with estimates of up to 80 percent of recruits infected without adenovirus vaccines.

As Hawksworth noted, "Administering the vaccine wasn't an option during this time because the manufacturer made a business decision to stop making it. The military took prevention measures such as increased hand washing and other environmental controls but literature shows, as does our study, that those methods are not nearly as effective as vaccination."

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# Navy Medicine's Scientific Foundation

*Barton and Baldwin: The Navy's Preeminent Botanical Scientists*

Part I

By Andre B. Sobosinski, Historian, Bureau of Medicine and Surgery

***"His rare industry and sagacity entitled him to take rank with the most deserving of our pioneers in the field of American botany."***

~William Darlington on the life of Navy Surgeon William Baldwin, USN



Portrait of Surgeon William Baldwin, USN  
(Photo courtesy of Andre Sobosinski, BUMED)

Not unlike the Dr. Stephen Maturin character in Patrick O'Brien's novels, the U.S. Navy's first physicians were products of enlightenment and explorers of the natural world. In addition to medical topography, early reports by ship surgeons often contained observations on climatology, zoology, geology, and especially botany.

It is little surprise that botany, one of the oldest natural sciences, was also one of the first scientific specialties in Navy Medicine. As most medicines used by ship surgeons in the eighteenth and nineteenth centuries were plant-based, the first Navy physicians needed to have knowledge of botany and material medica.

Two Navy physicians, however, William P.C. Barton (1786-1856) and William Baldwin (1779-1819) went far beyond a working knowledge of botany to make significance contributions in the field. In the

process, would help pioneer a proud tradition of science in Navy Medicine that continues to this day.

Dr. William Paul Crillon Barton was born into a prominent Philadelphia family that included David Rittenhouse (grandfather) and the preeminent botanist Benjamin Smith Barton (uncle). His uncle helped institute an academic tradition for botany at the University of Pennsylvania; he would later tutor Meriwether Lewis on uses of plants in medicine and food before the latter's journey into the unexplored Louisiana Territory in 1804.

Like many young physicians at the time seeking adventure and honor, Dr. William P.C. Barton decided on a career in the U.S. Navy, receiving a commission in 1809.

In his lengthy career—which extended until his death in 1856 — Barton would keep scurvy at bay by introducing a citrus ration to the U.S. fleet; publish the first writings on hospital administration in the military; help prohibit alcohol rations aboard Navy ships; and finally serving as the first chief of the Bureau of Medicine and Surgery (1842-1844).

While on active duty Barton also served tenures as professor of botany at the University of Pennsylvania

and at Thomas Jefferson Medical College, respectively, and set forth on an ambitious field research project to document American plant life.

In the process, Barton compiled several compendiums of American plants including *Flora Philadelphiae Prodromus* (1815), *Vegetable Materia Medica of the United States* (2 volumes, 1817-1825) and *Flora of North America* (1821-1823); each would be considered standards of botanical science.

Fellow Navy surgeon, William Baldwin was a student of Barton's uncle and botanist-extraordinaire William Bartram. A native of Newlin, Penn., Baldwin was commissioned in the Navy in 1812 serving first as medical officer for gunboat flotilla based in St. Mary's and later in Savannah, Ga.

Following the close of the War of 1812, Baldwin travelled through eastern Georgia and Florida collecting botanical specimens and penning detailed descriptions of local flora that would be used by botanist Stephen Elliott in his *Sketch of the Botany of South Carolina and Georgia* (1821).

In 1817, Baldwin was selected to serve as medical officer aboard

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# World Health Organization's Mission in Djibouti

Story courtesy of NAMRU-3 Public Affairs



Dr. Alia Zayed (left) conducts field training to Djibouti Ministry of Health workers on collecting samples. (Photo courtesy of NAMRU-3 Public Affairs)

CAIRO - Djibouti reported a malaria outbreak in early 2014 and requested assistance through the World Health Organization Eastern Mediterranean Regional Office (WHO/EMRO).

The U.S. Naval Medical Research Unit No. Three (NAMRU-3), as a WHO EMRO collaborating center, was requested to provide training on malaria vector surveillance and identification.

NAMRU-3's Vector Biology Research Program sent entomologists Dr. Alia Zayed and Ms. Reham TagelDin to

conduct training at the Ministry of Health laboratory in the Faculty of Medicine and at field sites in Ambouli, Arhiba, and Einguella, where cases of malaria had been reported.

The Djibouti Ministry of Health nominated staff from the six governorates of Djibouti to attend the training.

"This was my first time to participate in an outbreak intervention with the World Health Organization (WHO) and in Djibouti. I was impressed by how much the trainees absorbed in a

short period of time and were able to demonstrate their new knowledge," said TagelDin.

The primary goal of the classroom training was for the trainees to be able to identify the Anopheles mosquito, which is the carrier of the malaria parasite.

It also consisted of field training for the participants at Wadi Ambouli on how to set up CDC traps and then chill, sort and preserve the samples collected.

"The major challenge for this training visit was to find the best way to communicate with the trainees. Previous training sessions in Djibouti had been conducted in Arabic, French, and English; many of the trainees in this group only spoke Somali and also had limited scientific background," said Zayed. "Luckily, NAMRU-3 had previously trained Mr. Hussein Omar from the Ministry of Health's 'Service d'hygiène, Laboratoire d'Entomologie' in Djibouti City, who acted as our primary translator and facilitator."

Although NAMRU-3 doesn't currently have any active projects with the Ministry of Health of Djibouti, the NAMRU-3 science team hopes that this collaboration may serve as a step in reestablishing activity in this country.

"This intervention helps demonstrate part of the NAMRU-3 mission in the region through human capacity building and partnership with ministries of health while supporting the World Health Organization's Eastern Mediterranean Region," stated Lt. Joseph DiClaro, head of Vector Biology Research Program.

## NMRC Receives Funding for New Improved Tourniquet

Story by Mikelle D. Smith, Naval Medical Research Center Public Affairs

SILVER SPRING, Md., -- The Naval Medical Research Center's (NMRC) Office of Partnerships and Business Development (OPBD) successfully received funding to begin work constructing prototypes for a new and improved style of tourniquet, called a Rapid Activation Pneumatic Tourniquet.

“With the help of John Rein at the Office of Naval Research, we applied for funding specifically targeted for dual-use technologies that could help the first responders community, as well as the military,” said Dr. Todd Ponzio, head of the Office of Partnership and Business Development department at NMRC. “This technology was co-invented by a Navy physician at one of the Navy Hospitals and funding will

be used to create working prototypes.”

The NMRC OPBD is handling the commercialization activities while NMRC patent attorneys are handling the patent application.

Current tourniquet designs require a cloth material as well as a tightening device to apply. In many cases the individual must use two hands or have another person with them to properly apply the tourniquet and stem bleeding.

“Here, an individual would be able to apply this [rapid activation pneumatic] tourniquet in a matter of a few seconds, using a single hand,” said Ponzio. “One could certainly imagine these tourniquets being with first

responders, though there may also be markets related to general first-aid kits, as well as extreme sports enthusiasts.”

Prototypes of the rapid activation pneumatic tourniquet are currently focused on examining the benefits and costs associated with various pressurized gases, switch designs, and air bladder materials. For more information contact OPBD.

NMRC's OPBD is part of an ongoing Department of the Navy effort to promote innovative technologies, supporting more than 12 naval research laboratories throughout the U.S. and overseas to develop and share valuable innovations.

## Navy Medicine Lab Provides Infection Control Training in Jordan

Story courtesy of NAMRU-3 Public Affairs



Dr. Tamer Saeed, left, presents an exercise on putting on the personal protective gear that was then smeared with finger paint to simulate body fluids or blood. The trainees then had to take the personal protective gear off without contaminating their hands and clothes. (Photo courtesy of NAMRU-3 Public Affairs)

CAIRO – The U.S. Naval Medical Research Unit No. Three's (NAMRU-3) Global Disease Detection and Response Program (GDDRP) conducted two back-to-back training sessions in Amman, Jordan, on infection control measures and prevention for Middle East Respiratory Syndrome coronavirus (MERS-CoV) infections in Jordan, August 11 – 14.

Jordan, a Global Health Security partner country, is one of the countries where Mers-CoV emerged without being associated with travel to other affected countries.

According to the CDC web site MERS-CoV is a viral respiratory illness first reported in Saudi Arabia in 2012. Most people who have been confirmed to have MERS-CoV infection developed severe acute respiratory illness with fever, cough, and shortness of breath. About 30 percent of people confirmed to have MERS-CoV infection have died.

GDDRP's Dr. Tamer Saeed and Dr. Omar AbdelAziz conducted two sessions of roundtable training for 102 infection

control front line physicians and nurses from most of the Ministry of Health governorate hospitals and the King Abdullah University Hospital, a major university hospital in Jordan. This Quick Wins training is part of the Global Health Security Agenda and was funded by the Defense Threat Reduction Agency.

“Even though I have conducted many training sessions on infection control in Jordan, this group was highly motivated by the hands-on activities,” said Saeed.

The Ministry of Health in Jordan has conducted several on-the-job training sessions on infection control since the first MERS CoV case was reported there in November 2012. This was the first time training focused on a large number of infection control teams. The sessions included academic presentations, practical situations, and role playing. Topics included how to identify and manage suspected cases, assess the risk of infection, and apply preventive and protective measures.

The trainers used examples and risk

scenarios requiring the trainees to draft designs for isolation areas in their facilities based on the available resources and required infection control standards.

One particularly challenging role play involved choosing and wearing personal protective gear. The role players used finger paint to simulate body fluids and blood to visibly demonstrate the care needed in carefully putting on and removing the gear.

At the conclusion of the training, NAMRU-3 provided the training materials to the Ministry of Health, which plans to replicate the training. This Quick Wins project furthers NAMRU-3's mission of capacity building in the region through training and collaboration with regional ministries of health for disease outbreak preparedness.

The Global Health Security Agenda was launched February 13, 2014, to advance a world safe and secure from infectious diseases threats and to bring together nations to elevate global health security as a priority.

## Navy Medicine's Scientific Foundation

*Barton and Baldwin: The Navy's Preeminent Botanical Scientists*

(continued from page 10)

USS *Congress* on its mission to Venezuelan War of Independence in part to conduct field expeditions and investigations on sustainable vegetable production in South America.

Despite suffering from pulmonary tuberculosis, Baldwin was selected by the Secretary of War to be a part of Major Stephen Long's expedition to the Rocky Mountains in 1819. He would die of respiratory failure while on the expedition the very same year.

Although not as prolific as Barton, Baldwin's botanical observations were published in the *Journal of American Science* (1818) and posthumously

in *Transactions of the American Philosophical Society* (posthumous, 1825).

The thousands of specimens he collected would be distributed for various herbaria and museums throughout the country and be used for study.

The respect for Baldwin's work among fellow botanists was so great that the plant genus *Balduina* and the Baldwin Herbarium in Philadelphia, Penn. would later be named in his honor.



Navy Surgeon and Botanist William P.C. Barton, USN in 1831. Dr. Barton is shown here on one of his rambles through the outskirts of Philadelphia in search of new botanical specimens. (Photo courtesy of the Philadelphia Museum of Art)

## NAMRU-3 Participates in East/West Africa Malaria Task Force

Story courtesy of NAMRU-3 Public Affairs

CAIRO - The East/West Africa Malaria Task Force met in Bujumbura, Burundi, August 25 – 27.

Cosponsored by U.S. Africa Command (AFRICOM) and the Armed Forces Health Surveillance Center (AFHSC), this mil-mil task force was the first regional collaboration between African militaries to combat malaria. AFRICOM established this multi-military task force in 2012, to step up efforts to prevent one of the biggest killers in Africa.

The U.S. Ambassador to the Republic of Burundi, the Honorable Dawn Liberi, who attended the malaria forum, commented, “It is a great opportunity for United States Africa Command to collaborate with African partners to fight malaria during peacetime and support troops during their deployments for peacekeeping operations.”

The meeting organizers, Capt. David Weiss, AFRICOM Command Surgeon; and Col. James Cummings, Director, Division of Global Emerging Infections Surveillance AFHSC; welcomed military medical leaders from Djibouti, Burundi, Kenya, Rwanda, Tanzania, Uganda, Benin, Burkina Faso, Ghana, Niger, Nigeria, Senegal, and Togo.

The head of the U.S. Naval Medical Research Unit No. Three’s (NAMRU-3) Vector Biology Research Program, Lt. Joseph W. Diclaro II, gave two presentations on entomology training and establishing entomology surveillance programs.

These presentations specifically addressed NAMRU-3 AFHSC-funded activities in Liberia and the process of establishing entomology programs at the Liberia Institute for Biomedical Research (LIBR) and within the Armed Forces of Liberia.



Lt. Joseph W. Diclaro (center) presents at Task Force meeting in Burundi. (Photo courtesy of AFRICOM)

Dr. Refaat Hanna, AFRICOM epidemiologist, who championed the establishment of the Malaria Task Force network, hopes that the model used for cooperation on malaria activities can evolve into enhancing biosurveillance networks in East and West Africa.

This meeting also gave Diclaro the opportunity to highlight NAMRU-3’s work in Liberia which included the establishment of the molecular lab at LIBR.

This laboratory’s staff set up equipment for the Ebola diagnostics lab which is still in active operation.

Diclaro has been back twice since the outbreak started and said, “Although this is a tragic situation, it’s inspiring to see the Liberian techs we trained step up to support their country in the Ebola response.”

Diclaro was proud to have the opportunity to present NAMRU-3’s activities at the AFRICOM and AFHSC-GEIS supported East/West Africa Malaria Task Force meeting and shares in Hanna’s hopes that this organization will lead to a surveillance network that will have a broader impact among additional military partners.

## NAMRU-3’s Major Murphy Visits Camps in Kuwait

Story courtesy of NAMRU-3 Public Affairs



Camp Buehring, Kuwait—Maj Murphy center, is flanked on the right and left with the incoming and outgoing preventive medicine teams for U.S. Army and Air Force camps in Kuwait. Far right is the Command Surgeon for Area Support Group Kuwait, Col. Mark Burnett. (Photo taken by Prevmed Team, Camp Buehring)

CAIRO - Maj. Gleeson Murphy, VC, USA, who heads the Bacterial and Parasitic Disease Research Program at the U.S. Naval Medical Research Unit No. Three (NAMRU-3), visited three U.S. Army and Air Force camps in Kuwait to assess their diagnostic capabilities as part of an Armed Forces Health Surveillance Center-Global Emerging Infections Surveillance and Response Systems (AFHSC-GEIS)-funded research project.

Murphy also explored the feasibility of ongoing collaborative surveillance and research activities among the various medical units in Kuwait.

While the usual “reach back” for lab support in Kuwait is in Landstuhl, Germany, the Preventative Medicine team contacted GEIS following a traveler’s diarrhea outbreak asking for a deeper analysis. GEIS advised them to contact NAMRU-3, where

the Virology and Zoonotic Disease Research Program had first assisted the Camp Arifjan laboratory with flu diagnostics.

Murphy’s assessment began at their medical hub at Camp Arifjan. Next he visited Camp Buehring, and then Ali Al Salem Air Base. Together, his visits covered the major Army and Air Force medical laboratory facilities in Kuwait.

“It felt really good to get the answer for GEIS,” said Murphy. “With the draw down in Iraq, it was unclear what the remaining laboratory capacity was. It would be optimal if we could tap into the right surveillance system. The respiratory surveillance system appears to work well; so this may be the model to bring it all together to have a more cohesive surveillance system for CENTCOM.”

Murphy’s visit coincided with the Preventative Medicine team’s turnover which added value to the visit.

“While their lab capabilities are limited, they are aware of their limitations,” said Murphy. “All the Army and Air Force camps in Kuwait funnel into the Combined Support Hospital (CSH) at Camp Arifjan; and if they do not have the capacity to perform lab tests there, they forward it outside. So our interaction point should be the CSH.”

Part of NAMRU-3’s far-forward mission is to support surveillance and diagnostics for deployed forces. Concurrently, NAMRU-3 is able to improve logistics issues for timely and safe shipping of samples.

A second laboratory assessment is scheduled for the Army and Air Force assets in Qatar.

## Navy Medicine R&D Commanding Officers Meet in Silver Spring

Story by Doris Ryan, Public Affairs Officer, Naval Medical Research Center Public Affairs

SILVER SPRING, Md. – The Naval Medical Research Center (NMRC) hosted the Navy Medicine R&D Enterprise Leadership Meeting, Sept. 22 – 24.

Laboratory leadership and science directors from all eight CONUS and OCONUS laboratories came together here to share research updates, discuss issues of concern, and focus on the way ahead.

The overarching theme of the meeting was *Warfighter First* as the group focused on such topics as how R&D works with sponsors, partner nations and collaborators; operates forward; conducts pre-clinical or clinical trials; develops products for commercial development, and more.

“This meeting was an opportunity for the enterprise leadership to review the progress made over the last year and to ensure their programs are coordinated and aligned with Navy Medicine strategic goals and objectives,” said NMRC Commanding Officer, Capt. John Sanders. “The meeting allowed for discussing strategies and future plans to more effectively and efficiently invest in biomedical research that supports our Warfighters across the spectrum of battle space environments.”

The next meeting will be later in 2015 in Texas at the Naval Medical Research Unit – San Antonio.



Naval Medical Research Center Commanding Officer, Capt John W. Sanders III opens the 2014 Navy Medicine R&D Enterprise Leadership Meeting. Commanding Officers from all eight laboratories were in attendance, including key personnel from the enterprise. (Photo taken by Mikelle D. Smith, Naval Medical Research Center Public Affairs)

### NAVY MEDICINE R&D ENTERPRISE RESEARCH AREAS

#### Naval Medical Research Center

Biological Defense  
Infectious Diseases  
Operational & Undersea Medicine  
Bone Marrow

#### Naval Health Research Center

Epidemiology & Behavioral Science  
Medical Modeling, Simulation & Information Management  
Warfighter Performance  
Operational Infectious Diseases

#### Naval Medical Research Unit Dayton

Aerospace Medicine  
Environmental Health

#### Naval Submarine Medical Research Laboratory

Undersea Medicine

#### Naval Medical Research Unit San Antonio

Dental & Biomedical Research  
Combat Casualty Care  
Directed Energy

#### OCONUS Laboratories

Naval Medical Research Center Asia  
Naval Medical Research Unit No. Three  
Naval Medical Research Unit No. Six

These three laboratories specialize in Tropical Medicine

## NAMRU-3 Provides Training Workshop in Côte d'Ivoire

Story courtesy of NAMRU-3 Public Affairs



NAMRU-3's Ehab Amir (front row center) poses with trainees from the Institut Pasteur in Côte d'Ivoire. (Photo courtesy of the Institut Pasteur)

CAIRO – The U.S. Naval Medical Research Unit No. Three's (NAMRU-3) Ehab Amir, head of the Genomics Unit in the Viral and Zoonotic Disease Research Program (VZDRP), traveled to Côte d'Ivoire in August to conduct a four-day workshop on Influenza and Phylogenetic Analysis for laboratory staff at the Institut Pasteur.

Originating in France in 1887, the Institut Pasteur is one of the largest in the world with many branch laboratories in Europe, Latin America, Asia and Africa. In Côte d'Ivoire, the Institut Pasteur is the reference laboratory for the identification of communicable diseases such as hemorrhagic fever viruses, hepatitis and HIV, and also serves as a National Influenza Center.

The Global Emerging Infections Surveillance and Response System (GEIS) -funded workshop's goal was to enhance the capacity of Côte

d'Ivoire's National Influenza Center to sequence influenza A and B isolates and to analyze sequence data through phylogenetic analytical methods.

The training consisted of a theoretical introduction to the technology and the application of bioinformatics software for influenza sequencing analysis.

Mr. Amir trained 11 laboratorians from the institute's respiratory and molecular platform groups.

“The workshop participants commented that they liked the hands-on practice with the software, allowing them to gain the knowledge on downloading sequences on the National Institute of Health website Genbank and other online databases. They were happy that they were ready to analyze the sequences themselves, rather than sending them away for analysis,” said Amir.

Amir, who developed the training

materials, previously conducted similar training workshops in Ghana, Jordan, Oman and Egypt.

Due to the high demand for sequencing training by countries in West Africa and the Middle East, Lt. Cmdr. Gabriel Defang, head of VZDRP, developed a strategy, whereby Central Public Health Laboratories (CPHL) in countries requesting training must demonstrate proficiency in virus isolation and possess sequencing equipment as a prerequisite for receiving NAMRU-3 on-site training.

“This strategy has been very successful, as laboratorians in Ghana, Oman, and Jordan CPHLs were able to isolate circulating influenza viruses, sequence and analyze the viruses specific to their country, and submit the data to an internationally accessible genbank at the completion of the training,” said Defang.

Sequencing allows scientists to monitor antigenic changes, drug resistance and enhanced virulence in circulating influenza viruses. National Influenza Centers need this information to inform the local public health community of any viral changes seen in their countries.

“Mr. Ehab has been pivotal in NAMRU-3's goal of establishing sequencing capability in the African and Middle East regions,” added Defang.

NAMRU-3, has been sequencing influenza isolates since 2002, and contributes data for inclusion in the U.S. CDC's annual meeting to determine what influenza stains to include in the next vaccine.

# NHRC Launches Newly Designed Website

Story by Anna Hancock, Public Affairs Officer, Naval Health Research Center Public Affairs



SAN DIEGO -- Naval Health Research Center (NHRC) launched its newly redesigned website as part of the command rebranding effort as the Department of Defense's premier deployment health research center, Sept. 19.

At the core of the new website, users can quickly see the forward-thinking research, development, testing and evaluation NHRC's expert team and state-of-the-art facilities produce. The site also boasts a more visually appealing, streamlined presentation and user-friendly feel.

"As a service-based organization, we collaborate with partners all around the world," noted NHRC's Commanding Officer Capt. Jacqueline Rychnovsky. "It's vital that our virtual first impression accurately reflects

our scientific capabilities, expertise and brand as a Navy command with some of the nation's most intelligent scientists and researchers. A marked improvement since the site's original development more than 15 years ago."

The homepage presents the command's four main research areas - deployment health, operational infectious diseases, military population health, and the Department of Defense's HIV/AIDS Prevention Program. It then highlights the latest news and research products and more clearly explains the command's overall mission.

"The site also features various ongoing research efforts and as new content is regularly updated, (it) will be an excellent communication and educational tool," said Rychnovsky.

"The team streamlined over 600 pages of written content presented online into less than 100. It is easier to read, up to date, and is far more informative. We're proud of the team effort and the results."

As the DOD's premier deployment health research center, NHRC's cutting-edge research and development is used to optimize the operational health and readiness of the nation's armed forces. Within close proximity to more than 95,000 uniformed service members, world-class universities, and industry partners, NHRC's expert team sets the standards in joint ventures, innovation, and practical application.

To check out the new site, visit <http://www.med.navy.mil/sites/nhrc/Pages/default.aspx>.

# National Museum of Health and Medicine Science Cafe



The National Museum of Health and Medicine (NMHM) continues its monthly series of Medical Museum Science Cafes by presenting "Navy Medicine's R&D: A Global Enterprise."

**GUEST SPEAKER:** CAPT. JOHN W. SANDERS III, COMMANDING OFFICER, NAVAL MEDICAL RESEARCH CENTER, U.S. NAVY

**DATE:** TUESDAY OCTOBER 28TH, 2014

**TIME:** 6:00 TO 7:00 P.M.

**LOCATION:** THE SILVER SPRING CIVIC BUILDING  
1 VETERANS PLACE  
SILVER SPRING, MARYLAND 20910



He will provide insight on the latest in Navy medicine research and development and the role of its service members in the global community. Among the topics to be discussed include research on infectious diseases, biological defense, combat casualty care, military operational and expeditionary medicine, and bone marrow transplantation. For more information on this event, please call 301-319-3303 or visit [www.medicalmuseum.mil](http://www.medicalmuseum.mil).

## Navy Study Confirms Vaccine Effectiveness in Recruits

(continued from page 9)

FRI surveillance for this study took place at eight military recruit training facilities across the U.S. from 1996 until 2013.

When vaccine supplies ran out, experts saw the virus become highly endemic in recruit training centers.

In 2001, the Army worked with pharmaceutical companies to resume production. NHRC then tested the vaccines with Army counterparts and it received FDA approval in 2011.

“After the military reinstated the vaccine, the average plummeted from about 250 cases of the virus each week to two,” said Hawksworth.

NHRC regularly conducts diseases surveillance around the world, including within San Diego-based

military populations and at the U.S. Mexico border in collaboration with the Centers for Diseases Control and Prevention (CDC).

Military health care officials at NHRC are required to report a weekly FRI update as part of the Armed Forces Health Surveillance Program, the global health surveillance proponent for epidemiology across the Department of Defense.

“This is a study that can easily be translatable to the civilian sector,” explained Cmdr. Gary Brice, NHRC’s director for the Operational Infectious Diseases Directorate. “Our results reinforce the message that FDA approved vaccines are safe and very effective. For our military service members, protecting them is our primary mission.”

As the DOD’s premier deployment health research center, NHRC’s cutting-edge research and development is used to optimize the operational health and readiness of the nation’s armed forces.

Within close proximity to more than 95,000 uniformed service members, world-class universities, and industry partners, NHRC’s expert team sets the standards in joint ventures, innovation, and practical application.

To view the weekly Febrile Respiratory Illness (FRI) Surveillance Update, visit <http://www.med.navy.mil/sites/nhrc/Pages/Research-and-Development-FocusAreas.aspx?Category=INFECTIOUS-RPANDPUB>.

## Greetings from the NMRC Ombudsman!

Fall is upon us and there is a lot of activity going on at the command. It was good to see so many at the Dining Out and to meet so many new spouses. I really took Dr. Hoffman, the guest speaker’s words to heart. The work our service members are doing is truly at the forefront of Navy medicine R&D. Please take the time let your fellow service members know you value their contributions and acknowledge their willingness to put themselves in harms way in order to fulfill the mission of the command.

For the spouses and significant others who stay behind, please know you have my full support. As your Ombudsman, I am here to make sure you get access to the services you need both now when your service members are deployed, as well as, when they are safely at home.

Please save the date for Sunday, October 19 for the NMRC Spouse luncheon from 1100-1400, hosted by Mrs. Leighann Sanders. More information and invitation will follow—another good reason to sign up for the spouse email list! Many of you hopefully received an email from me already. If not, and you would like to be added to the Command’s spouse email list, please email [nmrc.ombudsman@gmail.com](mailto:nmrc.ombudsman@gmail.com) with your name, service member’s name, and contact information. This email list will only be used to communicate Command information and events pertinent to spouses and to distribute the Command newsletter.

From my Navy family to yours, have a great October and I hope to see all of the spouses at the luncheon!