

## Navy Surgeon General Visits Naval Medical Research Unit – San Antonio

By Mr. Randal K. LeBlanc, NAMRU-SA Public Affairs Officer

The Naval Medical Research Unit - San Antonio (NAMRU-SA) hosted an hour-long tour of the new Battlefield Health and Trauma (BHT) Research Institute, Fort Sam Houston, the new home of NAMRU-SA, for U.S. Navy Surgeon General Vice Adm. Adam. M. Robinson, Jr., December 6, 2010.

Capt. Vincent DeInnocentiis, NAMRU-SA commanding officer, and Cdr. Theodore St. John, NAMRU-SA executive officer, escorted Robinson along with members of the Navy Bureau of Medicine and Surgery (BUMED) team, including Capt. Brian Dawson, Executive Assistant to the SG, Capt. Joseph Surette, BUMED public affairs officer; and FORCM (FMF) Laura Martinez. Robinson stopped as he recognized Aviation Chief Henry V. Buckley (ret.), who served with the admiral onboard the *USS Coral Sea* (CV-43) in 1988. Mr. Buckley is the NAMRU-SA Administrative Officer.

DeInnocentiis focused on the new



Admiral Robinson examines a Leishmaniasis sample while Dr. Diana Bienek, senior scientist (center), and Capt. Vincent DeInnocentiis, commanding officer, NAMRU-SA (left) look on. Photos provided by NAMRU-SA Public Affairs.

Combat Casualty Care and Dental Research laboratory spaces. Robinson was introduced to Dr. Diana Bienek, senior scientist, and Ms. Stephanie Brown, research assistant, and Bienek provided a short presentation on a

recent and exciting research project entitled, "Topical Treatment of Cutaneous Lesions For Deployed Military Personnel With Leishmaniasis." The project is to develop a nontoxic, *Continued on page 7*

**NAVAL MEDICAL RESEARCH CENTER**

The Naval Medical Research Center will exhibit at the 2011 Military Health System Conference January 24-27 at the Gaylord National Hotel and Convention Center, National Harbor, Maryland. The exhibit area will be open January 25-26. NMRC will be located in booth 227 in the government section. Over 4,000 people are expected to attend the 2011 MHS Conference.

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## Commanding Officer's Message

It's time to say goodbye to 2010 and welcome in a new year. A new year always brings the potential for change and new opportunities, and that is what 2011 will bring to our enterprise. We are moving forward on scheduled BRAC initiatives, we will stand up NAMRU-6 in Lima, Peru in February; and, we will continue to build on the human and technological resources at all of our laboratories and also strengthen important partnerships essential to successfully meeting our mission. There is no question that the environment within which our biomedical research is conducted has changed rather dramatically over the last few years, and NMRC's work is recognized by the leadership of the Navy and Navy Medicine as important and an extraordinary value to our warfighters – current and future.

With over 1400 people in the U.S. and overseas, our job is to conduct basic and applied research in infectious diseases; biological defense; combat casualty care; bone marrow; aviation, diving, environmental medicine; and health surveillance.

The goal of our research is to translate discoveries and observations at the bench and in the field into products for the Navy and Marine Corps.

This is a good time to review our vision and mission statements -- *We provide world-class, operationally relevant health and medical research solutions – anytime, anywhere! Our mission is to conduct health and medical research, development, testing, evaluation, and surveillance to enhance the operational readiness and performance of DoD personnel worldwide.*

I look forward to working with all of you this year!



Commanding Officer sends,  
Richard L. Haberberger, Jr.  
CAPT, MSC, USN

## White House National Security/International Affairs Expert Visits NMRC

The Naval Medical Research Center (NMRC) provided a global enterprise presentation and a tour of the Biological Defense Research Directorate's (BDRD's) portable laboratory for a team from the White House led by Mr. Phil Coyle, Director for National Security and International Affairs, Office of Science and Technology Policy, December 3, 2010.

NMRC Commanding Officer Capt. Richard L. Haberberger, Jr. gave an overview of the NMRC Enterprise organizational structure and resources and then spoke on the research being conducted at NMRC Silver Spring. Haberberger also pointed out that the Naval Health Research Center's (NHRC's) Respiratory Disease Research Laboratory detected the first U.S. cases of H1N1 (swine) influenza in April 2009. This resulted in significant local, national and international attention, facilitating early public health intervention, preservation of operational readiness and, ultimately, contributed to decreased morbidity and mortality. It was pointed out that NHRC maintains a forward deployed diagnostic lab, the Pacific Rim Surveillance Center, at

Naval Hospital Yokosuka to rapidly identify respiratory infections. NHRC also conducts shipboard Febrile Respiratory Illness surveillance among large deck ships of the 2<sup>nd</sup>, 3<sup>rd</sup>, and 7<sup>th</sup> U.S. Navy Fleets.

Haberberger was followed by Dr. Stephen Walz, NMRC's Director for Field Laboratory Operations, who delivered a presentation on the NMRC commands and field sites outside the continental United States (OCONUS) in Egypt, Peru, Ghana, Singapore and Cambodia. Walz emphasized the emerging infectious disease surveillance, response and capacity building efforts of the OCONUS labs and noted the success of U.S. Naval Medical Re-



NMRC subject matter experts brief Mr. Phillip Coyle, Director for National Security and International Affairs, White House (fourth from left) and his team on the BDRD portable lab. Photo by Phil Collins.

search Unit No. 3 (NAMRU-3), Cairo, and U.S. Naval Medical Research Unit No. 2 (NAMRU-2), when still in Indonesia, in detecting and tracking the introduction and spread of highly pathogenic avian influenza in their respective host countries. Walz also presented maps showing the locations of some 164 individual OCONUS lab collaborations with foreign nations in

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# Promoting Force Health Protection in Southeast Asia



SLTC Tang Kong Choong (left), Deputy Commander, Military Medicine Institute of the Singapore Armed Forces, presents a plaque of appreciation to Capt. Christopher Clagett (right), Director of Expeditionary Preventive Medicine, Navy and Marine Corps Public Health Center. Photo provided by NAMRU-2 Detachment Singapore.

exercise conducted at the Naval Expeditionary Medical Training Institute located on Camp Pendleton, Calif. The exercise highlighted the unique force health protection, health threat analysis, and risk assessment capabilities these deployable units provide to the theater commander and identified several avenues for future collaborations on common force

regarding febrile respiratory illness surveillance. The SAF is also a collaborating partner in the DoD Global Influenza Surveillance Program. This exchange visit highlights the strengths of Navy Medicine supporting global operations through military medical partnerships and collaborations with partner nations in the Asia-Pacific region.

Infectious diseases have had a major influence on military campaigns throughout history and continue to pose formidable threats to military forces worldwide. Current strategies to provide extended homeland defense via enhanced forward presence of U.S. military units and an expanding role in disaster relief operations increases the exposure of military personnel to endemic and emerging infectious diseases and biological threats. These force health protection issues are not unique to U.S. forces; they also threaten our allies and security partners. The SAF, a reliable and capable coalition partner, are frequently called upon to deploy for disaster relief and medical support operations around the world.

In November 2010, Lt. Cmdr. Gary Brice of the U.S. Naval Medical Research Unit No. 2 (NAMRU-2) Detachment in Singapore led a delegation from the Singapore Armed Forces (SAF) Medical Command to observe a Forward Deployable Medical Preventive Medicine Unit pre-deployment field

health protection issues faced by both militaries.

During the trip to San Diego, the SAF delegation also visited the Navy Environmental and Preventive Medicine Unit No. 5 and the Naval Health Research Center (NHRC). The SAF and NHRC have a cooperative agreement

## Lt. Cmdr. Sebeny Receives Medal from Government of Djibouti

By Darnell P. Gardner, Jr., Public Affairs Officer, NAMRU-3

A U.S. Naval Medical Research Unit No. 3 (NAMRU-3) research physician was presented the medal “Knight of National Order of June 27<sup>th</sup>” by Djibouti Prime Minister His Excellency Dileita Mohamed Dileita, December 20, 2010.

Lt. Cmdr. Peter Sebeny, deputy head, clinical trials and military studies, was awarded the Republic of Djibouti’s third highest honor for his efforts in supporting capacity-building projects with the Ministry of Health (MOH), including the coordination of public health assessments, capacity-building and surveillance activities, and orchestrating a multi-agency visit to Washington, D.C. in 2009.

During the acceptance ceremony, Sebeny expressed his sincere appreciation for the chance to assist the MOH staff in their efforts to

enhance infectious disease surveillance. In addition, Sebeny expressed his appreciation to the U.S. Navy for the “opportunity to foster such important collaborations... and for the staff of NAMRU-3 with whom I share this award today for all our collective efforts.”

Sebeny worked in collaboration with the Djiboutian MOH, the focal point of infectious disease surveillance, and in particular with Dr. Ammar Abdo Ahmed, to identify priority areas in enhancing



Left to right: MOH H.E. Abdallah Abdillahi Miguil; Lt. Cmdr. Peter Sebeny; H.E. Dileita Mohamed Dileita; Stephanie Funk, USAID; Dr. Ammar Abdo Ahmed, General Director of Epidemiology and Health Information, MOH. Photo provided by NAMRU-3 Public Affairs.

epidemiological surveillance and  
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# Southern Partnership Station Works with NAMRU-6 in Peru

*Provided by Southern Partnership Station 2011 Public Affairs*

Southern Partnership Station 2011 (SPS 11) spent three weeks in Lima, Peru, during December. In addition to exchanges with Peruvian partners in the areas of Civil Affairs, Navy Criminal Investigative Service (NCIS), Marine Corps training and Navy Construction Battalion (Seabee) projects, the Medical Detachment aboard Swift had excellent interactions with Peruvian Navy, Army and Air Force colleagues. Capitán de Fragata Alejandro Mercado, the Peruvian Navy Infectious Disease Consultant and former liaison officer to U.S. Naval Medical Research Unit No. 6 (NAMRU-6), led these medical exchanges, which were seen as highly valuable by both the Peruvian and United States participants.

Cmdr. David Blazes and the SPS 11 Medical Detachment visited the major Peruvian military hospitals in Lima as well as the Peruvian National Institute of Health and the Peruvian Military HIV/AIDS consortium (COPRECOS). The Commanding Officer of NAMRU-6, Capt. John Sanders, welcomed SPS 11 to NAMRU-6 and hosted two symposia on military medicine for

medical officers and enlisted personnel, including a highly acclaimed Outbreak Investigation course developed by Dr. Andres Lescano of NAMRU-6.

“It was a great opportunity to have the Swift visit and to get to work with Cmdr. Blazes and his medical team. The enthusiasm of the team led to some great educational opportunities and professional exchanges between our two Navies,” Sanders said. “I hope we can continue to build upon that excitement.”

U.S. Naval Officers and Peruvian staff from NAMRU-6 were also able to tour Swift and see first-hand the unique capabilities of this highly versatile vessel.

The visit to Peru underscored how clear it is that Latin America, the Caribbean and the United States share common interests and security concerns, and that obtaining this security will require cooperative action throughout the region.

“Professional medical exchanges such as those with the Peruvian military will contribute greatly

to enhancing health cooperation in the region, and thus build better regional stability and security,” Blazes said.

SPS 11 will next visit Ecuador, where NAMRU-6 has several ongoing disease surveillance projects.

SPS is an annual deployment of U.S. ships to the U.S. Southern Command’s (SOUTHCOM’s) area of responsibility (AOR) in the Caribbean and Latin America. The mission’s primary goal is information sharing with navies, coast guards and civilian services throughout the region.

Commander, U.S. Navy Southern Command (COMUSNAVSO) is the naval component command for SOUTHCOM and is responsible for all naval personnel and assets in the SOUTHCOM AOR. COMUSNAVSO conducts a variety of missions in support of the U.S. Maritime Strategy, including Theater Security Cooperation, relationship building, humanitarian assistance and disaster response, community relations and counter-illicit trafficking operations.



*U.S. Naval Medical Research Unit No. 6 Commanding Officer Capt. John Sanders, left, gives a tour of his facility to Southern Partnership Station (SPS) 2011 Mission Commander Cmdr. Mark Becker. Becker visited the facility in support of SPS 2011, an annual deployment of U.S. ships to the U.S. Southern Command’s area of responsibility in the Caribbean and Latin America involving information sharing with navies, coast guards and civilian services throughout the region.*



*U.S. Naval Medical Research Unit No. 6 personnel pose for a picture on the flight deck of High Speed Vessel Swift (HSV 2) during a tour of the ship. The tour was in support of Southern Partnership Station 2011. Photos by Mass Communication Specialist 1st Class Jeffery Tilghman Williams.*

## NMRC Researchers at U.K. Association of Service Physicians Meeting

Capt. Stephen Savarino and Cmdr. Mark Riddle of the Naval Medical Research Center (NMRC) Enteric Diseases Department were invited to attend the United Kingdom (U.K.) Association of Service Physicians Meeting held December 12-15, 2010, at the Centre for Aviation Medicine, RAF Henlow, in Bedfordshire, England.

The meeting was attended by more than 60 physicians from the Royal Army, Air Force and Navy medical corps staff, representing approximately 90 percent of all U.K. military physicians (medicine).

As acute infectious diarrhea continues to be a significant health threat among U.K. forces serving in Afghanistan and Africa, experts from NMRC were invited to give seminars on the epidemiology of enteric illness in deployed U.S. military forces and diarrheal vaccine development efforts

within the joint Army-Navy Military Infectious Disease Research Program.

The meeting also afforded the opportunity to meet with top leadership in U.K. defense medicine, research and development, including Surgeon Rear Admiral Lionel Jarvis, Assistant Chief of Defense Staff (Health) and Chief Naval Medical Officer/Medical Director General (Naval) and Surgeon Commodore Alasdair Walker, Medical Director of the Joint Medical Command.

The partnership between U.K. and U.S. researchers continues to grow with joint projects in Afghanistan and sub-Saharan Africa. A 200-person prospective observational cohort study to estimate incidence, etiology and impact of acute infectious diarrhea and gastroenteritis is planned to start this spring in Kenya with support from the U.S. Army Medical



*Cmdr. Mark Riddle speaks at the U.K. Association of Service Physicians Meeting.*

Research Unit, Kenya, Microbiology Hub-Kericho. This field site, where approximately eight yearly cohorts of 1,200 British troops train for six weeks, represents a unique opportunity to conduct operationally relevant surveillance and research for infectious disease problems common to both countries in an important region.

Discussions were quite positive with a diversity of research interests, and future collaborations beyond enteric diseases appear favorable given the mutual interests, the strong academic background of the U.K. medical corps and the flexibility to pursue timely and relevant research.



*Capt. Stephen Savarino (left) and Cmdr. Mark Riddle (far right) of the NMRC Enteric Diseases Department attending the Association of Service Physicians Officers Mess, December 13, 2010, RAF Henlow, Bedfordshire, England. Photos provided by NMRC Enterics Diseases Department.*



## NAMRU-3 Initiates Project to Improve HIV Health Services

By Darnell P. Gardner, Jr., Public Affairs Officer, NAMRU-3

U.S. Naval Medical Research Unit No. 3 (NAMRU-3), in collaboration with the Egyptian Ministry of Health (MOH), initiated a Ford Foundation funded project aimed at improving health services delivered to people living with HIV in Egypt. The NAMRU-3 project team, consisting of Global Disease Detection and Response Program (GDDRP) Medical Anthropologist Anna-Leena Lohiniva and Health Promotion Specialist Dr. Manal Benkirane, first conducted a baseline survey to assess healthcare workers' knowledge, attitudes and practices related to HIV/AIDS in Om El Masryeen Hospital, a general hospital located in Giza. Once assessed, a training curriculum was introduced based on HIV basics, infection control and medical ethics. Emphasis was placed on the clarification of patient rights and challenging the stigma against people living with HIV.

Cmdr. Vince Barthel, Head, Virology and Zoonotic Disease Research Program, initiated the training by delivering lectures on the basics of HIV transmission to an assembly of physicians.

"It was great!" stated Barthel. "Most of them were very eager to learn about HIV and displayed caring enthusiasm for the welfare of those stricken by this unforgiving illness. We, as medical



*Dr. Manal Benkirane delivers HIV awareness training to medical personnel from the Om el Masryeen Hospital. Photos provided by NAMRU-3 Public Affairs.*

professionals, are bound by an oath to preserve life by whatever means possible."

After the opening lectures, healthcare professionals made up of surgeons, nurses and medical assistants were made aware of the actual modes of HIV transmission. Prevention and treatment updates were also addressed to correct misconceptions about HIV infection. At the conclusion of the lectures, attendees were introduced to a young woman who is HIV positive. She graciously agreed to share her experiences on the reality of living with HIV in Egypt.

Benkirane explained, "It was a good opportunity to discuss misconceptions about the disease and make the health professionals aware of the impact of discriminating practices. It was really great to see doctors who initially had shown resistance to dealing with a person living with HIV stand up to hug the HIV positive person who shared her story with them."

Currently, infection control training is underway, including modules on standard precautions such as environmental cleaning, invasive procedures and prevention of mother to child transmission.

"This training aims at providing healthcare professionals with the self-confidence to carry out procedures safely when dealing with HIV positive patients," said Lohiniva. "This is one of the main contributors to stigma."

A post-training survey is planned in February 2011, after modules on infection control and healthcare ethics are completed. This survey will evaluate the impact of the intervention on healthcare employees and determine their preparedness to treat people living with HIV.

The Ministry of Health wishes to make Om el Masryeen Hospital a referral site for HIV positive patients in need of surgical care.



*Medical personnel from the Om el Masryeen Hospital receive HIV awareness training.*

## Who We Are - Office of Legal and Technology Transfer Services

# The Business of Science — Protecting Navy Medicine's Inventions

Patents protect Navy Medicine's intellectual property and allow commercial businesses to license the patent for the benefit of our warfighters and also U.S. taxpayers. Each year the NMRC Office of Legal and Technology Transfer Services (OLTS) team pursues patent protection for about 20 new inventions, and the team currently has over 50 U.S. and 20 foreign applications in various stages of the patent process. The invaluable patent application process is done behind the scenes, and when successfully completed a 20-year patent is issued by the U.S. Patent and Trademark Office that protects the unique work done by NMRC researchers.

The first step in the patent application process, before any public disclosure, presentation or publication, is for a researcher to fill out a couple of forms. The "Record and Disclosure of Invention" form gives the OLTS team basic information on the nature of the invention and inventorship. The "Patent Rights Questionnaire" form lets the OLTS team determine whether the federal government has sufficient rights

to the invention to allow for filing a patent application. These forms are available on the NMRC website or by calling 301-319-7503 or 301-319-9433.

The OLTS team then develops a detailed filing strategy to support the patent application process. U.S. patents are effective only within the U.S., U.S. territories and U.S. possessions. The NMRC plan could include a foreign filing strategy, which means filing an application under the Patent Cooperation Treaty. The strategy could also include the decision to file a provisional or non-provisional patent application. A provisional application is not examined by the U.S. Patent and Trademark Office, but it does set a "priority date" that is subsequently incorporated into follow-on applications or foreign applications and allows a protected one-year window prior to filing the provision application with the Patent Office. The process of patent prosecution and follow-on applications and justifications can take three to five years or longer.

Licensing can bring royalties to the laboratory and stimulates commercial development. Patent licensing opportu-

NMRC Office of Legal and Technology Services will offer two informational workshops in 2011.

### Session 1: Cooperative Research and Development Agreements (CRADAs) and Patents

January 11 and 19; February 15 and 26 from 9:00 a.m. to 12:15 p.m.

### Session 2: Patent Licensing, Support Agreements and Ethics

January 13 and February 15 from 1:00 p.m. to 4:25 p.m.

For more information, contact the NMRC OLTS office.

nities include exclusive and non-exclusive rights to cutting-edge Navy Medicine technologies because many of NMRC's patented inventions have dual use functions that meet the needs of both military medicine and the general public. Currently, NMRC has 71 active patents ranging from vaccines and drugs to medical devices with 57 percent licensed to the private sector.

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effective topical treatment for cutaneous leishmaniasis lesions, which will support warfighter health and readiness by negating the need for evacuating infected personnel from the battlefield.

The Combat Casualty Care Research Department also includes investigates resuscitative medicine, trauma medicine and expeditionary medicine. The resuscitative medicine program focuses on the protection, resuscitation and stabilization of combat casualties at echelon 1 and 2 points of care in the combat theater. The trauma medicine program focuses on primary and pre-clinical efforts to develop drug products and advanced therapies for the treatment of hemorrhagic shock on the battlefield. Expeditionary medicine program researchers work with the Marine

Corps and the Navy operational commands to identify and effectively mitigate operational stressors and improve survivability.

The Dental and Biomedical Research Department includes an applied clinical science program, an applied laboratory science program and a dental materials and equipment program. The applied clinical science area emphasizes the development of new restorative dental materials as well as the epidemiology, diagnosis, treatment and prevention of oral and dental diseases that affect the health, performance and readiness of Sailors and Marines. The applied laboratory science area focuses on microbiology, immunology, etiology, diagnosis and prevention of medical and dental diseases and develops diagnostic tools to detect infectious diseases from

saliva samples. The dental materials and equipment area focuses on efforts to minimize the environmental impact and occupational hazards of Navy dentistry, including mobile dental delivery systems for use by the Fleet Marine Force and dental treatment byproducts in deployed environments.

DelInnocentiis also provided Robinson and his team a brief tour of the Army and Air Force research spaces. The surgeon general had the opportunity to talk with a few of the Navy's sister services' research colleagues.

Prior to the tour, Robinson arrived at the Army medical center at the same time as Brigadier General Joseph Carvalho, Jr., Commanding General, Brooke Army Medical Center. Robinson and Carvalho had a discussion in the parking lot as soldiers walked by saluting, wondering what was going on.

## White House Director for National Security Visits NMRC

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the European Command, African Command, Central Command and Pacific Command areas of responsibility. Finally, Walz described the role that the OCONUS labs also play in the development and evaluation of products to protect the warfighter, including vaccines and drugs to prevent and treat malaria and bacterial diarrhea, vaccines against dengue and drugs to treat cutaneous leishmaniasis.

The day ended with a tour of the BDRD portable laboratory. BDRD is a leader in the field of portable detection systems. The portable lab's equipment enables military personnel in the field to quickly conduct confirmatory assays to detect the presents of biological agents and requires only three people to operate. The lab includes supplies sufficient to process samples for

polymerase chain reaction and enzyme-linked immunosorbent assay testing. The lab also is equipped with

protective gear, a generator, a freezer, field lighting and field uninterruptible power supply.

### Sebeny Receives Medal from Government of Djibouti

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strengthening the MOH's laboratory capabilities. These efforts support the establishment of a National Institute of Public Health, which is envisioned to become a regional center of excellence for infectious disease surveillance.

Several infectious disease surveillance protocols are underway between the MOH and NAMRU-3. Funding for these projects has been through the U.S. Department of Defense's Armed Forces Health Surveillance Center - Global Emerging Infections Surveillance

System, the Department of State Biosecurity Engagement Program, and the Centers for Disease Control and Prevention.

"NAMRU-3 provides technical expertise as well as serving as the link between the World Health Organization regional reference laboratory and the Djibouti MOH," stated Djibouti Minister of Health, His Excellency Abdallah Abdillahi Miguil, at the ceremony. He closed by saying, "We hope to become the regional reference laboratory for cholera, influenza and Rift Valley fever in the Horn of Africa region."

### Happy New Year from the NMRC Ombudsman!

I would like to wish everyone a very Happy New Year and welcome everyone back from what I hope was a restful and recuperative holiday season. Hopefully, we have all returned ready to make 2011 a very fulfilling and successful year, both in our personal and professional lives.

**Remember: You Are Always Networking.** In our current economy, we probably all know someone who is looking for a job. For the mobile military career, spouses are often always looking ahead for the next great opportunity. Or maybe you, yourself, just want a change. Remember that EVERY encounter is a networking opportunity. Each person you communicate with knows someone, who knows somebody else. More than 60 percent of jobs are found using this method. Consider the following as you network your way to your new job:

- **Be Purposeful.** Define what you will accomplish by networking and what information you need to be successful.
- **Be Specific.** Know yourself (education, skill sets, experience) and prepare a 1-3 minute presentation so that people can get to know you and the type of job you want to find.
- **Be Prepared.** Identify your network; attend meetings and gatherings in your field of interest. Getting involved is the best way to meet people that may be able to help you in your career.
- **Be Professional.** Ask for advice instead of asking for a job. Focus on asking one thing at a time that is relevant to your area of interest. Remember your professional "presence" when using social media such as Facebook, LinkedIn and Twitter.
- **Be Proactive.** Stay organized by keeping a list of your contacts and update regularly. Send thank you emails to those that offered advice or referrals. Always ask if you can follow up with a phone call.
- **Be Authentic.** Always be yourself and do things at your own pace.

**Just Breathe!** It's the start of a new year. Let's keep ourselves calm and relaxed with the new iBreathe app for iPhone and iPod Touch. This biofeedback application will guide you through deep breathing exercises as a stress-management technique. Deep belly breathing has been shown to release endorphins in the body, which are our natural pain killers. Deep breathing can relax muscles, relieve general aches and pains, and help with sleeplessness. Some studies show that these techniques can help asthma sufferers as well. This application will be available for free on the iTunes website after January 2011. Android platforms and platforms for children are also currently being developed.

If you need help finding all the great resources the military has to offer or just need someone to talk to, please contact me at [angela.prouty@med.navy.mil](mailto:angela.prouty@med.navy.mil) or 217-722-4981.

Angela Prouty  
Ombudsman, NMRC

# NAMRL Studies Effects of Hypoxic Stress on Cognitive Processes

Provided by NAMRL Public Affairs

Over the last several months, the Naval Aerospace Medical Research Laboratory (NAMRL) hypoxia research team has been preparing for an upcoming study on the effect of acute hypoxic stress on vital cognitive and perceptual processes. The most recent in a line of related studies, the new effort focuses not only on the breakdown of these processes, but also how they recover. The study includes measures of simple cognitive and perceptual processes such as visual acuity and simple reaction time as well as higher-order processes such as executive function.

“Our goal is to determine whether hypoxia affects both simple and higher-order processes similarly and concurrently, or if some processes are temporarily preserved at the expense of others,” said Dr. Jeffrey Phillips, the project’s principal investigator. “We are also trying to develop a more accurate picture of the recovery sequence of these vital processes. Earlier work done in our laboratory suggests that full cognitive perceptual recovery lags significantly behind the restoration of most measures of blood oxygen saturation.”

NAMRL scientists will also test the feasibility of in-cockpit monitoring of brain oxygen saturation using near infrared spectroscopy (NIRS) as part of a hypoxia early detection and warning system for naval aviators. Preliminary data suggest that NIRS measurements taken from the cerebral cortex corre-



Dr. Jeffrey Phillips (left), Principal Investigator, and Research Assistant (right), Summer Dodson, monitor subjects during hypoxia exposure via a video camera mounted inside the testing booth and a computer monitor located outside of the booth. Photo provided by NAMRL Public Affairs.

late more closely with the recovery of cognition and perception than measurements taken from other places on the body, such as the finger.

“NIRS measurements taken from the cerebral cortex appear to respond more quickly to the onset of hypoxic stress and provide a more accurate picture of the recovery of cognitive perceptual processes following exposure than other measures,” Phillips said. Currently there is no physiological monitoring system in any naval aircraft to warn pilots of an impending hypoxic episode, he added.

NAMRL researchers are poised to execute the Navy’s latest effort to expand our knowledge of hypoxia’s effect on basic cognitive and perceptual processes that are critical to mission safety and success. The upcoming study requires the calibration of several advanced physiological and psychological data acquisition systems, including measures of blood oxygen saturation, pupilometry, expired gas and cognitive perceptual performance. Experimental trials are scheduled to begin in January and conclude this spring.

## NMR&D News

is an authorized publication of the Naval Medical Research Center, 503 Robert Grant Avenue, Silver Spring, Maryland, 20910. NMR&D News is published monthly by the NMRC Public Affairs Office. Please contact the Public Affairs Officer at 301-319-9378 or [svc.pao.nmrc@med.navy.mil](mailto:svc.pao.nmrc@med.navy.mil) with questions or to submit an article.

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