

NEWS FROM THE FRONT

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The Tropical Medicine Course CJTF-HOA For Medical Personnel Deployed to Africa



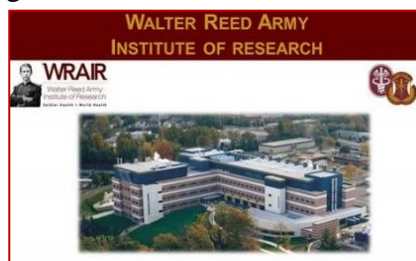
LTC Julia Debold

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INTRODUCTION

Tropical infections will continue to pose a significant threat to U.S. forces as they deploy to diverse locations around the globe, despite a century of formal research and advances in countermeasures. Over the last one hundred years morbidity from tropical infections has at times surpassed combat casualties; non-battle injuries were six times more common than battle injuries during the 21st century conflicts.¹ The Department of Defense (DoD) recognizes the continual need, (just as the need was acknowledged more than a century ago), that medical personnel should have some level of training in recognizing, diagnosing and treating relevant tropical diseases while serving in an austere environment. The DoD offers several tropical medicine courses to accomplish this mission. One of the more historical courses was held at the Walter Reed Army Institute of Research (WRAIR) in Washington, D.C., which was founded in 1893 as the first Army Medical School; the Tropical Medicine Course at that school was launched in 1941 and persevered until 1993. The Navy also ran a separate program, The Navy's Medicine in the Tropics Course and in the 1990s it became a joint Army-Navy endeavor and is now known as the U.S. Military Tropical Medicine (MTM) Course, Navy Medicine Professional Development Center,



at the Uniformed Services University (USU) in Bethesda, Md. In 2010, due to operational needs of the Special Operations Command and the newly formed Africa Command, the WRAIR course was re-established. The USU and WRAIR courses have different goals and target distinct audiences, yet they are complementary in nature and share some of the same lecturers and faculty.²

The current Director of the MTM Program is Dr. Nehkonti Adams, LCDR, USN. Medical providers in Djibouti recently had the privilege to attend one of the MTM's mobile training courses at Camp Lemonnier, Djibouti (CLDJ) and spent three days under the tutelage of Dr. Adams. During the span of the three days, several of the instructors repeatedly used the phrase "*history does not repeat itself, but it does rhyme.*" As we explore the evolution of tropical medicine and during that process review diseases associated with military campaigns, we clearly see this "rhyming" in action as we recognize a world today, not identical but similar, to one a century earlier.

¹ Beaumier, Coreen M., Gomez-Rubio, Ana Maria, Hotez, Peter J., Weina, Peter J., "United States Military Tropical Medicine: Extraordinary Legacy, Uncertain Future." *PLoS Neglected Tropical Diseases* 7(12) (Dec 2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3873258/> (accessed May 29, 2018).

² Coldren, Rodney L. COL, Brett-Major, David M. CDR, Hickey, Patrick W. LTC, Garges, Eric Maj, Weina, Peter J. COL, Corrigan, Paula COL, Quinnan, Gerald RADM, "Tropical Medicine Training in the Department of Defense." *Military Medicine* 177, 4:361 (2012) https://www.researchgate.net/publication/224976084_Tropical_Medicine_Training_in_the_Department_of_Defense (accessed June 2, 2018).

MAJOR TROPICAL DISEASES IN U.S. MILITARY WARS AND CONFLICTS – HIGHLIGHTS (See tables in Annex A, all of the following extracted from articles in U.S. National Library of Medicine National Institutes of Health³).

Statistics of morbidity and mortality from tropical diseases, especially during early wars vary somewhat, however studies show a prevalence of certain major tropical diseases during U.S. conflicts throughout history. Additionally, some conditions have longer-term health ramifications, even if treated.

Cases of malaria were rampant during World War I, II, Korean War and Vietnam War. There were reported cases during Operations Desert Shield and Storm, UN Operation Restore Hope in Somalia, Operations Enduring Freedom, Iraqi Freedom and New Dawn, Operation Sheltering Sky and USAID efforts in Liberia. During conflicts 2001-present (as of 2013) malaria incidence of occurrence was 52.4 cases per 1,000, diagnosed with a median time of 233 days AFTER return to the U.S. In 2003, 44% of 268 Marines deployed to Liberia became infected with malaria, 40 had to be evacuated, four of them with severe symptoms. In 2009 a Seabee deployed to Liberia died from malarial complications (*P. falciparum*). The number of cases were substantially less than earlier conflicts, however still occurred and resulted in loss of man days and life. The sequelae of malarial relapse was initially an issue, however with treatment of the dormant life stages in the liver now available, recurrences are few. Those who are/were unfortunate to have contracted *P. falciparum* type with cerebral infection have risk of longer term neurological effects.

Dysentery and diarrhea afflicted over 700,000 troops during WWII. Diarrheal disease occurred in greater than 50% of U.S. troops during Operations Desert Shield/Storm, in 77% of soldiers in Iraq and 54% of those in Afghanistan. There is increasing evidence that bacterial intestinal infections increase risk for autoimmune illness, gastrointestinal complications and extra-intestinal infectious disease may trigger certain chronic diseases.⁴

Dengue was the third most frequently reported tropical infection during WWII, cause of up to 80% of fevers during the Vietnam War, smaller numbers reported during Operation Restore Hope in Somalia and Operation Uphold Democracy in Haiti.

Leishmaniasis cases were reported during WWII; cutaneous and visceral cases were reported during Operations Desert Shield/Storm and during deployments into Iraq and Afghanistan. Cutaneous leishmaniasis was also a considerable problem for those training in the jungles in Panama. During Operation Iraqi Freedom, more than 1,700 personnel were diagnosed with

³ Beaumier, Coreen M., Gomez-Rubio, Ana Maria, Hotez, Peter J., Weina, Peter J., "United States Military Tropical Medicine: Extraordinary Legacy, Uncertain Future." *PLoS Neglected Tropical Diseases* 7(12) (Dec 2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3873258/> (accessed May 29, 2018).

⁴ Ternhag A., Torner Anna, Svensson A., Ekdahl K., Johan G., "Short-and Long-term Effects of Bacterial Gastrointestinal Infections." *Medscape Family Medicine* <https://www.medscape.com/viewarticle/568616?pa=bDlRw9xP9bFVo08tOZCsLKN8b9LJIF62qZbRdXjM1B0fkJ4%2FUVHag52NAaiSnCGD8Sivl8ziYv73GUyW5rsbWA%3D%3D> (accessed June 4, 2018).

leishmaniasis and many required evacuation for treatment.⁵ There are several types of leishmaniasis, depending on parasite. Skin sores from the cutaneous type can heal on their own, however this can take months to years. Some types of cutaneous leishmaniasis may spread to the mucous membranes and this may not be noticed until years after the skin ulcers have healed. Again depending on type of leishmaniasis parasite, some types if untreated can lead to visceral (internal organs) infection and often are fatal.⁶ Depending on the type of parasitic strain, treatment can have side effects and may require hospitalization for monitoring.

Hookworms infected greater than 20% of the U.S. forces during Operation Urgent Fury in Grenada.

As we can see, the major tropical infections inflicting harm upon U.S. troops during past and more recent conflicts include intestinal infections by bacteria and amebic dysentery, soil-transmitted worms (e.g. hookworm), vector-borne diseases including malaria (*falciparum* and *vivax*) and dengue, and both types of leishmaniasis. The U.S. Army Medical Research and Materiel Command (MRMC), who is responsible for ensuring U.S. forces are able to remain in peak health and are equipped to protect themselves from disease and injury especially on the battlefield,⁷ applies Armed Forces Medical Intelligence to quantitative algorithms to identify the most significant infectious disease risks to deployed troops.⁸ The MRMC's most recent expert panel in April 2010, by utilizing this algorithmic method, determined the top priorities of infectious disease threats are malaria, bacteria-caused diarrhea, dengue fever and leishmaniasis.⁹ Although accuracy of data and methods of gathering differ, one can see a similar thread of disease through military history.

⁵ "Military Infectious Diseases Research Program (MIDRP)." http://mrmc.amedd.army.mil/index.cfm?pageid=medical_r_and_d.midrp.overview (accessed June 2, 2018).

⁶ "Parasites – Leishmaniasis." *Centers for Disease Control and Prevention* https://www.cdc.gov/parasites/leishmaniasis/gen_info/faqs.html (accessed June 4, 2018).

⁷ "About MRMC", last modified Date: 18 Jun 2013, <http://mrmc.amedd.army.mil/index.cfm?pageid=about.overview> (accessed May 31, 2018).

⁸ Burnette WN., Hoke CH. Jr., Scovill J., Clark K., Abrams J., Kitchen LW., Hanson K., Palys TJ., Vaughn DW., "Infectious Diseases Investment Decision Evaluation Algorithm: A quantitative Algorithm For Prioritization of Naturally Occurring Infectious Disease Threats to the U.S. Military." *PubMed.gov U.S. National Library of Medicine National Institutes of Health*, Abstract: (2008 Feb; 173(2), <https://www.ncbi.nlm.nih.gov/pubmed/18333494> (accessed May 28, 2018).

⁹ Beaumier, Coreen M., Gomez-Rubio, Ana Maria, Hotez, Peter J., Weina, Peter J., "United States Military Tropical Medicine: Extraordinary Legacy, Uncertain Future." *PLoS Neglected Tropical Diseases* 7(12) (Dec 2013), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3873258/> (accessed May 29, 2018).

MILITARY TROPICAL MEDICINE COURSE in Djibouti



The Navy Medicine Professional Development Center joined with CJTF-HOA Surgeon Cell to offer a three day MTM course 15-17 May 2018. In addition to the Director, Dr. Adams, there were also lecturers from the WRAIR, 6th Fleet Force Health Protection Office, HOA Surgeon Cell, HOA's Civil Affairs Functional Specialty Unit (FxSP), and the Naval Medical Research Unit (NAMRU) in Ghana; the speakers were all graduates of the MTM Program.

Out of the five “W’s”, the WHO and the WHY are worth further discussion. Medical professionals from all U.S. military services, foreign militaries and local personnel have attended past courses. The most recent course in May 2018 included personnel from AFRICOM, USARAF, USMC providers in country providing support to security cooperation efforts, medical personnel from nearby Japanese and French camps, civilian medical personnel supporting HOA tactical units downrange and the Medical Officer from the U.S. Embassy Djibouti. The end state of the MTM course is to increase Force Health Protection (FHP) and troop readiness, just as FHP was a primary end state for Britain and U.S. interests in tropical diseases more than a century ago. A more immediate objective in achieving the end state is to provide medical personnel relevant knowledge and understanding to address medical issues specific to deployment areas, especially for those who may be a considerable distance from a military base.¹⁰ U.S. Air Force Captain Marilou Mote, a previous CJTF-HOA Environmental Health Officer stated “knowing the risks can help them determine between illnesses that share some of the same symptoms, like the flu versus malaria.” The course includes not only information about cause, symptoms, diagnosis and treatment, but also focuses on counter-measures. ‘An ounce of prevention is worth a pound of cure’ and prevention and FHP is an important force multiplier.¹¹ Secondly, the three days of fellowship with other providers gave opportunity to share knowledge and experiences, to build networking and to enhance alliances with our multi-national and governmental partners that otherwise may not have occurred.

The three-day course is conducted every six months at CLDJ, in order to incorporate medical personnel as they rotate into theater; medical professionals from all geographic regions and experiences are welcome to attend. As LCDR Nehkonti Adams, Director so aptly stated, “The world is becoming more interconnected, in that our militaries are participating in more

¹⁰ Cunningham, Jill LCDR, “Military Tropical Medicine Course Provides Valuable Training.” *The Journal* (24 Aug 2017) http://www.dcmilitary.com/journal/features/military-tropical-medicine-course-provides-valuable-training/article_102089cf-9cba-5c5b-b2b7-7c3abeb9e08f.html (accessed May 21, 2018).

¹¹ “Military Infectious Diseases Research Program (MIDRP).” http://mrmc.amedd.army.mil/index.cfm?pageid=medical_r_and_d.midrp.overview (accessed June 2, 2018).

humanitarian, disaster relief and crisis-response missions. Preparing our practitioners in cases of tropical medicine is essential to mission success. The program must involve providers across the services, as well as foreign militaries and civilian collaborators in order to succeed.”

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Annex-A, Major Tropical; Diseases in U.S. Military Wars and Conflicts

MAJOR TROPICAL DISEASES IN U.S. MILITARY WARS AND CONFLICTS				
War/ Conflict	Years	Major Areas	Tropical Disease	Estimated or Reported Number of Cases
World War I	1917-18	Americas and Caribbean	Malaria	27,203 malarial admissions
World War II	1942-45	South Pacific, especially New Guinea, the Philippines, other Pacific Islands	Dysentery and diarrhea	756,849
			Malaria	572,950
			Dengue	121,608
			Hookworm	19,943
			Lymphatic filariasis	14,009
			Sandfly fever	12,634
			Scrub typhus	7,421
			Amebic dysentery	4,504
			Schistosomiasis	1,672
			Endemic typhus	893
			Leishmaniasis	361
Strongyloidiasis	Not determined			

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MAJOR TROPICAL DISEASES IN U.S. MILITARY WARS AND CONFLICTS				
War/ Conflict	Years	Major Areas	Tropical Disease	Estimated or Reported Number of Cases
Korean War	1950-53	Korea	Malaria Hantaan virus Japanese encephalitis	>34, 864 admissions 1,600 cases w/renal syndrome Not determined
Vietnam War	1964-73	Vietnam	Malaria Dengue Chikungunya Hepatitis A Scrub Typhus Melioidosis Leptospirosis Amebic dysentery Hookworm Strongyloidiasis	65,053 admissions Up to 80% of fevers of unknown origin Not determined Not determined Not determined Not determined Not determined Not determined Not determined Not determined Not determined

MAJOR TROPICAL DISEASES IN U.S. MILITARY WARS AND CONFLICTS				
War/Conflict	Years	Major Areas	Tropical Disease	Estimated or Reported Number of Cases
Operation Urgent Fury	1983	Grenada	Hookworm	>20%
Jungle Training Panama	1980's	Panama	Cutaneous leishmaniasis	Not determined

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MAJOR TROPICAL DISEASES IN U.S. MILITARY WARS AND CONFLICTS				
War/ Conflict	Years	Major Areas	Tropical Disease	Estimated or Reported Number of Cases
Operations Desert Shield and Storm	1991-92	Iraq, Kuwait, Saudi Arabia	Diarrhea	>50%
			Cutaneous leishmaniasis	19
			Visceral leishmaniasis	12
			Malaria	7
			Q fever	3

MAJOR TROPICAL DISEASES IN U.S. MILITARY WARS AND CONFLICTS				
War/ Conflict	Years	Major Areas	Tropical Disease	Estimated or Reported Number of Cases
UN Operation Restore Hope	1992-93	Somalia	Malaria	112
			Dengue	Not determined
Operation Uphold Democracy	1994	Haiti	Dengue	342 seropositive

MAJOR TROPICAL DISEASES IN U.S. MILITARY WARS AND CONFLICTS				
War/ Conflict	Years	Major Areas	Tropical Disease	Estimated or Reported Number of Cases
Operations Enduring Freedom, Iraqi Freedom, New Dawn	2001-present (as of 2013)	Afghanistan Iraq	Diarrhea	77% Iraq; 54% Afghanistan
			Q fever	Outbreaks in Iraq
			Malaria	Vivax type attack rate of 52.4 cases per 1,000 soldiers among Army Rangers deployed to eastern Afghanistan
			Cutaneous leishmaniasis (various subtypes)	0.23% of deployed US ground forces in Operation Iraqi Freedom; 2.1% among a 2004 survey of 15,549 US military personnel deployed to one or more operations At least 9 cases
			Visceral leishmaniasis Brucellosis	3 cases

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