Naval Medical Research Center Begins Phase 1 Testing of Diarrhea Vaccine

Dr. Frederic Poly and Dr. Renee Laird, research scientists with Naval Medical Research Center (NMRC), pose for a photo in the Enteric Diseases laboratory. NMRC's Enteric Diseases Department, led by Poly, have partnered with the National Institute of Health's National Institute of Allergy and Infectious Diseases to begin phase 1 testing of a new vaccine for Campylobacter jejuni, a foodborne pathogen. *U.S. NAVY / Michael Wilson*

SILVER SPRING, Md. – Researchers with Naval Medical Research Center (NMRC)'s Enteric Diseases Department have partnered with the National Institute of Health's National Institute of Allergy and Infectious Diseases to begin phase 1 testing of a new Campylobacter jejuni vaccine, NMRC announced in a Dec. 19 release.

Campylobacter jejuni, a foodborne pathogen, is one of the most common causes of diarrheal illness in the U.S. and abroad, and can impact readiness of deployed or traveling service members.

Phase 1 testing, currently underway at Cincinnati Children's Hospital Medical Center, focuses on the safety and best means of Campylobacter vaccine delivery. Researchers will vaccinate 60 patients in total as part of Phase 1 testing. This first phase of testing is expected to continue through the end of 2023.

Phase 2 testing will involve vaccinating groups of adults with a dose of the vaccine determined in phase 1, to determine its effectiveness in protecting against Campylobacter. NMRC researchers expect to begin phase 2 testing by 2025 at the earliest, depending on funding and the facilities available.

Diarrhea is a frequently occurring illness during military operations, despite modern preventive medicine efforts. The impact of severe diarrhea can be debilitating and impair a service member's ability to do their job. Acute diarrheal illness during deployment is commonly responsible for loss of duty days, negatively affects mission readiness and may be fatal in the worst cases.

"With really infectious diarrhea, you get cramping, and if you have cramps, you can't really operate," said Dr. Frederic Poly, head of NMRC's Enteric Diseases Department, who has been involved with the project since 2005. "You can develop a fever; you're going to get dehydrated and you're going to lose cognitive perception. These are all symptoms that will negatively impact how you function."

Following recovery from initial infection and bouts of diarrhea, individuals can still experience long-term effects

of infection.

“With Campylobacter, there’s potential downstream effects, like irritable bowel syndrome or Guillain-Barré syndrome, which can lead to respiratory and neurological issues,” noted Lt. Yuliya Johnson, a microbiologist with NMRC. “It doesn’t happen to everyone, but there is still an associated risk we hope to mitigate by developing a vaccine.”

According to Poly, this vaccine will be the first developed for use against Campylobacter, and if successful, has the potential to benefit civilian and pediatric populations as well. Vaccination at a young age can curb developmental issues caused by diarrhea that might otherwise affect physical and mental development in children.

Poly, NMRC’s most recent senior civilian of the quarter for science, leads the NMRC Enteric Diseases Department. The department, composed of 23 full time microbiologists, molecular biologists, biochemists and immunologists, researches treatments for the prevention of infectious bacterial diarrhea.

This past year, the department completed development and clinical evaluation of a prophylactic against another military relevant enteric pathogen, ETEC (enterotoxigenic E. coli). The enteric diseases lab is also working on the development of an oral prophylactic to prevent infection from several other intestinal pathogens.

NMRC and its commands are engaged in a broad spectrum of activity from basic science in the laboratory to field studies in austere and remote areas of the world to investigations in operational environments. In support of the Navy, Marine Corps and joint U.S. warfighters, researchers study infectious diseases, biological warfare detection and defense, combat casualty care, environmental health concerns, aerospace and

undersea medicine, medical modeling, simulation, operational mission support, epidemiology and behavioral sciences.