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HEARING ON MULTI-DRUG RESISTANT ORGANISM INFECTIONS

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Chairman Snyder, Representative Wittman, members of the committee, thank you for the opportunity to discuss US Army efforts to prevent and treat Multidrug-resistant organism (MDRO) infections.

Multidrug-resistant organisms, and more specifically, multidrug-resistant (MDR) gram-negative bacteria, have increasingly become a healthcare threat in the US and worldwide. The Infectious Diseases Society of America has attempted to increase awareness of this issue in the US through their “Bad Bugs, No Drugs” campaign. Infections with these organisms chiefly occur in hospitalized patients, often through transmission between patients (i.e., through cross-contamination), and are termed healthcare or hospital-acquired infections (HAI), also known as nosocomial infections. This increase in MDRO infections has reduced the extent to which bacterial infections are treatable by antibiotic drugs. Focus in the US and abroad to control these infections has included attempts to prevent transmission of MDRO within hospitals and other healthcare settings. These infection prevention and control efforts have been championed by The Joint Commission (TJC) through patient safety goals and by the Centers for Disease Control (CDC) through guidelines for the prevention of MDRO infections.

Since the onset of Operations Iraqi Freedom and Enduring Freedom, infection and colonization with MDRO, especially MDR *Acinetobacter baumannii-calcoaceticus* complex, have complicated the care of injured US military personnel returning from Iraq and Afghanistan. Other MDRO causing infections in our wounded include extended-spectrum beta-lactamase producing enterobacteriaceae (e.g., *E. coli*, *Klebsiella*

pneumoniae), MDR *Pseudomonas aeruginosa*, and methicillin-resistant *Staphylococcus aureus* (MRSA).

The source of these bacteria in our returning combat-injured personnel has not been fully elucidated. Although most of these bacteria can be found on the skin of healthy people, it is not common to find MDR strains of these bacteria colonizing in healthy adults. Studies in healthy Soldiers have not found MDR gram-negative bacteria, although MRSA is not uncommonly found (as with Americans in general). There have been some suggestions that these bacteria might be introduced into wounds at the time of injury from environmental debris. This has not been supported by several small studies looking for early MDRO contamination of wounds. It appears most likely these bacteria are spread nosocomially both in the combat theater, along the long journey back to, and within, military medical centers in the US.

DoD Regulation 6025.13-R requires military treatment facilities (MTFs) to have a Healthcare Quality Assurance Program. These programs mirror those in US civilian facilities and include activities such as infection control, patient care assessment, review of healthcare records, health resources management review, and risk management review. As is suggested by TJC and CDC guidelines, MDRO-specific responses/policies at individual MTFs are based on local risk assessment and identified needs. TJC National Patient Safety Goal 07.03.01 requires hospitals to implement evidence-based practices to prevent hospital-acquired infections due to MDRO. Patients with known or suspected MDRO are placed under contact precautions (i.e., healthcare providers wear gloves and gowns when providing care), based on CDC guidelines, to decrease nosocomial spread. In 2008, the Military Healthcare System

(MHS) joined the CDC's National Healthcare Safety Network (NHSN), allowing sharing and comparison of HAI data with other US healthcare facilities.

In addition to routine practice and participation in US civilian healthcare standards (TJC, CDC guidelines, etc.), the MHS has responded with specific efforts focused on ameliorating the MDRO problem in returning injured US military personnel. These include establishment of admission MDRO colonization screening of injured personnel, development of specific guidelines to prevent infections in the combat-injured, efforts to improve infection prevention and control in the combat theaters, establishment of a MDRO repository and surveillance network, and enhanced research efforts.

Admission MDRO colonization screening is performed at major medical centers (Landstuhl Regional Medical Center, Walter Reed Army Medical Center, National Naval Medical Center, Brooke Army Medical Center) who receive combat-injured US personnel. Established in 2005 to screen only for *Acinetobacter*, this program currently screens for all MDRO. Patients are not released from contact precautions/isolation unless they screen negative. Results from this screening are collated, reviewed, and reported by monthly rates. This provides near real-time monitoring of rates and epidemiology of MDRO colonization and infection in evacuated personnel. The DoD Global Emerging Infection Surveillance and Response System (GEIS; a division of the Armed Forces Health Surveillance Center (AFHSC)) has supported the clinical laboratories performing this admission screening through funding of molecular typing equipment to further enhance epidemiological study of the recovered MDRO.

Clinical practice guidelines developed by a US Army, Air Force, Navy, and civilian consensus conference have been produced and promoted. These guidelines for the prevention of infection after combat-related injuries focus on limiting antibiotic overuse and basic infection control interventions. Critical review of infection control practices and challenges in the combat theater hospitals have been conducted in 2008 and 2009. From these review missions, interventions to improve infection control efforts in the deployed setting have been pursued. These have included renewed focus on basic infection control practices such as handwashing, isolation precautions, cohorting (grouping people with similar infections together), and deployment of clinical microbiology and antibiotic control. Additionally, electronic resources have been established to support deployed healthcare providers. The Army Medical Department Center and School hosts a short course to train additional infection control officers to lead infection control efforts in our deployed hospitals. A standardized infection control policy was produced and adopted by the Afghanistan theater. Medical personnel deploying with or to a Combat Support Hospital receive training on prevention and control of infections at the Joint Forces Combat Trauma Management Course at Fort Sam Houston. This course provides guidance to US military health care providers in the diagnosis, treatment, and prevention of infections in those individuals wounded in combat.

A repository to collect and study MDRO has been established with support of the United States Army Medical Research and Materiel Command. The MDRO Repository and Surveillance Network system (MRSN) was established to collect and characterize bacterial isolates and provide support for epidemiologic study of the MDRO problem

across the MHS, including in the combat theater. In conjunction with clinical and transportation data, the MRSN could help localize sources of MDRO to enhance and focus infection control responses. Data from the Joint Theater Trauma Registry (JTTR) will be essential to this effort.

Over the past several years the DoD has enhanced and expanded research in the prevention and treatment of MDRO. This includes the standing up of two new research programs – Intramural Wound Infection Research Program and Infectious Diseases Clinical Research Program. The DoD has established an intramural wound infection research section under the Military Infectious Diseases Research Program. This section has focused on better understanding the pathophysiology and treatment of MDRO infections. An interagency collaboration with the National Institute of Allergy and Immunology has established the Infectious Diseases Clinical Research Program (IDCRP). This program supports interservice multicenter clinical research focused on clinically important infectious disease threats to the warfighter and military community including MRSA and other MDROs, and infectious complications of war wounds. The IDCRP's Trauma Infectious Diseases Outcomes Study (TIDOS) began enrollment of patients in June 2009. TIDOS has been established to study interventions and outcomes in our combat-wounded who develop MDRO infections. The JTTR has established an infectious disease module which not only supplements this project, but provides data for further study of the infectious disease risks, interventions, and outcomes associated with combat trauma.

The US Army is committed to aggressive efforts to prevent and treat MDRO infections. This includes a commitment to continued research aimed at understanding,

preventing, and treating these infections. Additional efforts are underway to prevent the transmission of MDRO within our military hospitals. We join civilians, and other federal agencies, in our commitment to combat the spread of MDRO infections. Thank you again for the opportunity to address the Army's efforts and thank you for your continued support to our Nation's Soldiers.