

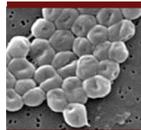
## Why Medical Facilities Should Participate in the Network

The network's ultimate mission is integrating multiple levels of analysis for timely interdiction and management of antibiotic resistance across the entire military health care system.

To ensure the accomplishment of the mission, the network seeks partners. Collaboration with the network:

- ▶ facilitates the sharing of epidemiologic information
- ▶ helps hospitals meet Joint Commission accreditation requirements for infection control and patient safety, as well as mandatory state reporting rules
- ▶ optimizes empirical antibiotic selection
- ▶ increases the likelihood of earlier detection of an outbreak or emerging pathogen
- ▶ provides cost savings to participating hospitals.

For example, during the first year of its existence, on eight separate occasions, network participation allowed four facilities to conduct outbreak investigations or expand existing surveillance programs without diverting clinical laboratory resources or burdening microbiology laboratory with extra workload.



Multidrug-resistant Organism Repository and Surveillance Network (MRSN)

For more information on targeted organisms, processing and shipping of isolates and participating in the network, contact any of the following:

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## The Multidrug-resistant Organism Repository and Surveillance Network (MRSN)



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# The Multidrug-resistant Organism Repository and Surveillance Network (MRSN)

## What Is the MRSN?

Responding to the recent epidemic of Gram-negative multidrug-resistant organism (MDRO) nosocomial and wound infections in the U.S. Military Health System, the Walter Reed Army Institute of Research launched the Multidrug-resistant Organism Repository and Surveillance Network (MRSN) in July 2009.

Until then, no agency within the Department of Defense collected and characterized these organisms across the enterprise to inform best clinical practices, influence policy, and enhance infection prevention and control efforts.

The MRSN currently comprises a microbiology laboratory, organism repository and a seven-facility network of Army hospitals, including those in combat zones. The network is available to Naval and Air Force medical facilities and will eventually expand to include all Army hospitals, and potentially all U.S. military hospitals.

## How the MRSN Works

Participating hospital laboratories submit all targeted MDRO, along with clinical and demographic information, to the central laboratory at WRAIR. The repository determines genetic-relatedness; performs extended phenotypic and phylogenetic analyses, preserving the specimens indefinitely; and relays clinically relevant information to hospitals, medical leaders and policymakers.

More specifically, isolates undergo:

- ▶ confirmatory antibiotic susceptibility testing on all three commercial automated platforms

- ▶ pulsed-field gel electrophoresis to determine strain relatedness
- ▶ optical genome mapping
- ▶ RT-PCR for NDM and VIM-type metallo-lactamase producing genes
- ▶ archival cryopreservation.

Clinical and demographic information, combined with laboratory analyses are to develop customized, event-driven reports, such as strain-relatedness among patients and locations. Regular reports, such as monthly antibiograms, are also produced.

Both types of reports are sent to clinicians, infection control teams and policymakers, and distributed through Army Public Health Command venues and the media to guide empirical therapy and enhance outbreak or emerging pathogen detection.

Ultimately, when the MRSN is fully mature, antibiograms and reports will be posted on a secure website and available to clinicians anywhere, anytime.

Network personnel conduct site visits to enhance isolate collection and provide actionable information to hospital infection preventionists by identifying potential outbreak strains, originating sources and patterns of transmission.

The network is currently targeting methicillin-resistant *Staphylococcus aureus* (MRSA), and multidrug-resistant *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Acinetobacter baumannii*.

## Assistance From the MRSN Is Independent of Location

The MRSN has demonstrated its value and effectiveness by promptly providing useful information to military treatment facilities in Iraq, aboard the USNS Comfort, Walter Reed Army Medical Center and National Naval Medical Center.

During the MRSN's first year, more than 3,000 isolates were collected, and the network characterized 895 isolates, including 715 for the presence of the emergent NDM-1 gene. Turn around time from request by the facility for laboratory assistance to feedback of actionable information, ranged between 3.5 days for hospitals in the National Capital Area to 13 days for the USNS Comfort stationed off the coast of Haiti.

## Testimonials

The network played an important role during a recent fatal outbreak of MRSA in a neonatal intensive care unit (NICU).

“Due to timely feedback from the MRSN, there was an immediate relocation of infants in the NICU, intensified and repeated cleaning of the pods that housed the infants, and the implementation of a new infection-control policy wherein all admissions to the NICU are now actively screened for MRSA, said the facility's infection control officer.”

An infectious disease clinician at the outbreak facility stated, “It is totally plausible that without feedback from the MRSN, nosocomial transmission of the implicated strain would have continued, resulting in increased morbidity and more lives lost.”