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More Rapid Detection of MRSA Colonization of the Nares by PCR Testing

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Rates of healthcare associated methicillin-resistant *Staphylococcus aureus* (MRSA) infections have steadily increased since the 1960s, despite the application of numerous infection control precautions and antimicrobial use controls. More than 50% of all *Staphylococcus aureus* isolates obtained from patients in intensive care units in the United States are methicillin-resistant. Rising MRSA infections in otherwise healthy individuals in the community indicate that this organism has expanded beyond its traditional role as a health care related pathogen. Infections caused by MRSA result in increased morbidity, mortality, length of hospitalization, and health care costs, compared with infections caused by methicillin-susceptible *S. aureus*.

Routine Screening Recommended

Asymptomatic colonization with MRSA can be transient, intermittent, or persistent for months to years, although carriers are at risk of developing subsequent invasive disease. The anterior nares are the most frequent site of MRSA colonization. A recommended MRSA eradication strategy in health care facilities is to routinely screen for MRSA to identify, isolate, and sometimes treat carriers, with the ultimate goal to eliminate the pathogen from the facility. Active surveillance improves the detection of MRSA colonization compared with clinical cultures alone. Routine active surveillance, or screening, for colonization with MRSA is a key component of infection control strategies to limit the nosocomial spread of this organism, as recommended by the Society for Healthcare Epidemiology of America (SHEA) in 2003. Rapid identification of MRSA facilitates the recognition of carriers and the implementation of timely isolation, thereby minimizing the potential transmission of MRSA between patients. Infection control practices, such as placing hospitalized patients who are colonized or infected with MRSA in contact precautions, have limited the spread of this organism. Additionally, routine surveillance can prevent the misclassification of imported MRSA carriage as a hospital-associated transmission.

PCR Offers Quicker TAT

The conventional culture method for MRSA has a turn-around-time of 1 to 3 days. A real time polymerase chain reaction (PCR) assay for the detection of MRSA directly from nasal swabs is available that detects the presence of MRSA colonization, with a turn-around-time of less than 24 hours. This assay simultaneously detects the Staphylococcal Cassette Chromosome *mec* (*SCCmec*), containing the *mecA* gene that confers methicillin-resistance, and a *S. aureus* specific sequence located within the *orfX* gene. These two genes permit the detection of methicillin-resistance and the differentiation of *S. aureus* from coagulase-negative staphylococci, yielding the reliable identification of the presence of MRSA. Studies in intensive care units have shown that a rapid PCR method can reduce the transmission of MRSA by half compared to the use of a culture method.

Infection Control Surveillance

To assist in the more rapid identification of patients who should be placed in contact isolation, the PCR assay to detect MRSA colonization of the nares is offered. The PCR test has a sensitivity equivalent to or greater than the conventional culture method. The negative predictive value of the PCR assay is >95%, permitting the reliable identification of patients who are not colonized with MRSA. This PCR method more rapidly identifies patients colonized with MRSA, permitting the more efficient and effective use of infection control resources to reduce the transmission of MRSA in health care facilities.

Quick Facts

- ▶ More than 50% of all *Staphylococcus aureus* isolates obtained from patients in intensive care units in the United States are methicillin-resistant.
- ▶ Infections caused by MRSA result in increased morbidity, mortality, length of hospitalization, and health care costs
- ▶ Screening, for colonization with MRSA is a key component of infection control strategies to limit the nosocomial spread of this organism
- ▶ A real time polymerase chain reaction (PCR) assay, directly from nasal swabs, is available that detects the presence of MRSA colonization with a turn-around-time of less than 24 hours
- ▶ The negative predictive value of the PCR assay is >95%, permitting the reliable identification of patients who are not colonized with MRSA.



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Test Information

DESCRIPTION MRSA by PCR

METHOD PCR

ORDER CODE MRSPCR

CPT CODE 87641

SPECIMEN REQUIREMENTS Obtain nasal swab using BD Culturette Plus swab. Insert swab into the nares. Rotate swab in each nares two to five times clockwise and counter clockwise, about three-fourths of an inch into the nasal passage (adult) so that squamous epithelial cells from the inside of the nose are obtained. Place swab into culturette. Store and transport refrigerated.

COMMENTS 1) Indicate source of specimen.
2) Only nares specimens are acceptable for the PCR assay.

RANGES Source
MRSA PCR Result
MRSA PCR Status

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