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ACTIVE SURVEILLANCE FOR THE PREVENTION AND CONTROL OF METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* (MRSA) AT-A-GLANCE BACKGROUNDER

A well-documented approach to preventing MRSA transmission in hospitals is through “active surveillance,” an admission regimen that involves the testing of patients to detect the presence of the MRSA microorganism¹. Active surveillance may also be performed during periodic sweeps of certain high-risk wards such as the ICU.

Prompt identification of the MRSA bacteria on patients enables healthcare providers to initiate proper interventions aimed at preventing MRSA-associated infections. Colonized or infected individuals can be isolated, placed on appropriate contact precautions, decolonized, and treated almost immediately to minimize the opportunity for further MRSA transmission and additional patient infection.

AN OVERVIEW OF ACTIVE SURVEILLANCE

- Upon testing positive, patients may be isolated, decolonized and/or treated, with strict enforcement of appropriate barrier precautions and hand hygiene protocols.
- The active surveillance testing approach used along with other infection prevention methods is supported by guidelines provided by:
 - The Society for Healthcare Epidemiology of America (SHEA)²
 - The Association for Professionals in Infection Control and Epidemiology (APIC)³
 - The CDC Healthcare Infection Control Practices Advisory Committee (HICPAC)⁴
- SHEA guidelines clearly state: “Active surveillance cultures are essential to identify the reservoir for spread of MRSA and VRE (Vancomycin resistant Enterococcus) infections and make control possible using CDC’s long-recommended contact precautions.”⁵
- Active surveillance includes testing those at high risk for harboring MRSA, which can include variables based on past healthcare exposures as well as various lifestyle and community factors, such as:
 - History of MRSA infection or colonization
 - History in the past year of hospitalization
 - Residence in an elder care or long-term care facility
 - History of dialysis and end-stage renal disease, diabetes mellitus and/or surgery
 - History of indwelling catheters or medical devices that pass through the skin into the body
 - Recent and/or frequent antibiotic use

- High prevalence of MRSA in local community or patient population
 - Close contact with someone known to be infected or colonized with MRSA
 - Crowded living conditions (e.g., homeless shelters, jails, prisons)
 - Infection among sports participants who have skin-to-skin contact, pre-existing skin damage, shared clothing and/or equipment
 - Advanced age
- In the U.S. there are many hospitals that have successfully implemented active surveillance in to control the current MRSA epidemic and eliminate MRSA-associated infections. Examples of successful programs include: Evanston Northwestern Healthcare, Evanston, IL; the University of Pittsburgh Medical Center, Pittsburgh, PA; Newark Beth Israel Hospital in Newark, NJ; and University of Maryland Medical Center, Baltimore, MD.
 - Newer rapid molecular testing methods are the ideal technology for implementing active surveillance measures. Obtaining definitive results for MRSA in two hours - instead of the two to three days associated with traditional culture methods - allows proper precautions and treatment to begin almost immediately. The rapid test helps minimize the risk of complications and transmission to others, and avoid the need for extended isolation while awaiting results.

OTHER TYPES OF MRSA SURVEILLANCE

Universal Surveillance, also known as all-admissions surveillance, introduces the testing of all admitted patients, not just “high risk” patients (as described above). A new study released at the American Society for Microbiology's 46th Annual Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC™) demonstrates that implementing universal surveillance is far more effective than just passive or targeted active surveillance when monitoring for MRSA.

“**Search and destroy**” is an approach that is used successfully in countries such as Finland, Denmark and the Netherlands to keep MRSA at low levels.^{6,7,8} It involves using an active surveillance approach for patients and healthcare personnel, with screening for MRSA at admission, then at intervals in high-risk wards and prior to discharge. It is coupled with strictly enforced contact precautions. Judicious use of broad-spectrum antibiotics is also emphasized.⁹

Passive surveillance entails only testing those who have clinical signs or symptoms of MRSA infection, and is the method most commonly used for identifying MRSA in hospital patients in the U.S. A non-active surveillance approach, with dependence upon routine cultures to identify patients with MRSA, will not identify 85 percent of patients colonized with MRSA upon admission to the hospital.¹⁰ Patients identified as MRSA carriers through active surveillance are treated far more rapidly with stringent contact precautions to limit the transmission of infection. Hospital programs to control and prevent MRSA transmission can not be effective in the absence of active surveillance for incoming patients and with the resulting rapid implementation of contact precautions for those who are identified to be carriers of MRSA.

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- ¹ Muto, C.A., Jernigan, J.A., Ostrowsky, B.E., Richet, H.M., Jarvis, W.R., Boyce, J.M., et al. (2003). SHEA guideline for preventing nosocomial transmission of multidrug-resistant strains of *staphylococcus aureus* and *enterococcus*. *Infection Control and Hospital Epidemiology*, 24 (5), 362-386.
- ² Muto, C.A., Jernigan, J.A., Ostrowsky, B.E., Richet, H.M., Jarvis, W.R., Boyce, J.M., et al. (2003). SHEA guideline for preventing nosocomial transmission of multidrug-resistant strains of *staphylococcus aureus* and *enterococcus*. *Infection Control and Hospital Epidemiology*, 24 (5), 362-386.
- ³http://www.apic.org/AM/Template.cfm?Section=Search§ion=Consensus_Reports&template=/CM/ContentDisplay.cfm&ContentFileID=284
- ⁴ <http://www.cdc.gov/ncidod/dhqp/Library/pdf/ar/mdroGuideline2006.pdf>
- ⁵ Muto, C.A., Jernigan, J.A., Ostrowsky, B.E., Richet, H.M., Jarvis, W.R., Boyce, J.M., et al. (2003). SHEA guideline for preventing nosocomial transmission of multidrug-resistant strains of *staphylococcus aureus* and *enterococcus*. *Infection Control and Hospital Epidemiology*, 24 (5), 362-386.
- ⁶www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=15066745&dopt=Abstract
- ⁷ jcm.asm.org/cgi/content/full/43/4/2034?view=long&pmid=15815056#R1
- ⁸ Boyce, J.M., Cookson, B., Christiansen, K., Hori, S., Vuopio-Varkila, J., Kocagöz S., et al. (2005) Methicillin-resistant *staphylococcus aureus*, *The Lancet Infectious Diseases*, 5 (10), 653-663.
- ⁹ Boyce, J.M., Cookson, B., Christiansen, K., Hori, S., Vuopio-Varkila, J., Kocagöz S., et al. (2005) Methicillin-resistant *staphylococcus aureus*, *The Lancet Infectious Diseases*, 5 (10), 653-663.
- ¹⁰ Salgado, C.D. & Farr, B.M. (2006). What proportion of hospital patients colonized with methicillin-resistant *staphylococcus aureus* are identified by clinical microbiological cultures? *Infection Control and Hospital Epidemiology*, 27(2), 116-121.