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Focus on Methicillin Resistant *Staphylococcus aureus* (MRSA)

PART I - INTRODUCTION TO MRSA

This is the first of multiple part series focusing on MRSA, and is mostly basic introduction to the aptly named “Superbug”.

Introduction: *Staphylococcus aureus* are bacteria commonly carried on the skin or in the nose of healthy people. Approximately 25% to 30% of the population is colonized in the nose, meaning *Staphylococcus aureus* are present, but not causing an infection. Sometimes they can cause an infection, and are one of the most common causes of skin infections in the United States. Most of these skin infections are minor (such as pimples and boils) and can be treated without antibiotics. However, they can also cause serious infections (such as surgical wound infections, bloodstream infections, and pneumonia).

Some *Staphylococcus aureus* are resistant to antibiotics. Methicillin resistant *Staphylococcus aureus* or MRSA is a type of *Staphylococcus aureus* that is resistant to commonly used antibiotics called beta-lactams, which include Methicillin, Oxacillin, Penicillin and Amoxicillin. While 25% to 30% of the population is colonized with *Staphylococcus aureus*, approximately 1% is colonized with MRSA.

Healthcare-Associated - MRSA (HA - MRSA): *Staphylococcus aureus* infections, including MRSA, occur most frequently among persons in hospitals and healthcare facilities (such as nursing homes and dialysis centers) who have weakened immune systems. These Healthcare-associated Methicillin Resistant *Staphylococcus aureus* (HA-MRSA) infections include surgical wound infections, urinary tract infections, bloodstream infections, and pneumonia.

Community-Associated – MRSA (CA - MRSA): *Staphylococcus aureus* and MRSA can also cause illness in persons outside of hospitals and healthcare facilities. MRSA infections that are acquired by persons who **have not** been recently (within the past year) hospitalized or had a medical procedure (such as dialysis, surgery, catheters) are known as Community-associated MRSA (CA-MRSA) infections. *Staphylococcus aureus* or MRSA infections in the community are usually manifested as skin infections, such as pimples and boils, and occur in otherwise healthy people. Over 12% of clinical MRSA infections are community-associated, but this varies by geographic region and population. The general trend is a rise in such infections.

CDC has investigated clusters of CA-MRSA skin infections among athletes, military recruits, children, Pacific Islanders, Alaskan Natives, Native Americans, men who have sex with men, and prisoners. The locations where CA-MRSA may become prevalent include schools, dormitories, military barracks, households, correctional facilities, Tattoo parlors, and day-care centers.

Prevalence of MRSA: The number of hospital admissions for MRSA has exploded in the past decade. Between 1995 and 2005, MRSA related admissions were increased ten-fold, and from 2000 to 2005 alone, these were tripled. In 2005 in the United States alone, 368,600 hospital admissions for MRSA—including 94,000 invasive infections—resulted in 18,650 deaths. The number of MRSA fatalities in 2005 surpassed the number of fatalities from hurricane Katrina and AIDS combined and is substantially higher than fatalities at the peak of the U. S. polio epidemic.

Currently, 85 percent of MRSA infections are healthcare associated; MRSA accounts for 60 percent of all staphylococcal infections. At least 58 percent of MRSA infections originate in the community but are

healthcare associated. The death rate, length of stay, and cost of treating patients with MRSA are more than double other hospital admissions.

Risk Factors: Factors that have been associated with the spread of MRSA skin infections can be described as FIVE C's:

- (1) **C**rowding
- (2) Frequent skin-to-skin **C**ontact
- (3) **C**ompromised skin (cuts and abrasions)
- (4) **C**ontaminated items and surfaces, and
- (5) Lack of **C**leanliness (poor hygiene).



Precautions: Some of the most common precautions that may prevent spread of MRSA include practicing good hygiene by:

- 1. Keeping hands clean by washing thoroughly with soap and water or using an alcohol-based hand sanitizer
- 2. Keeping cuts and scrapes clean and covered with a bandage until healed
- 3. Avoiding contact with other people's wounds or bandages, and
- 4. Avoiding sharing of personal items such as towels or razors

In the outbreaks of MRSA, direct skin-to-skin contact, rather than environment, has played a significant role in the transmission of MRSA. .

To Screen or not to Screen? Under certain circumstances, e.g., investigation and prevention of an outbreak, as a pre-admission hospital or nursing home requirement, pre-surgical requirement, or at a dialysis center, routine screening for MRSA may be instituted. A few states have called for universal patient screening, and some hospital systems have adopted it as a pre-admission requirement. This testing is to detect MRSA colonization by a patient or a healthcare worker, or a patient's family members, rather than actual infection, and thus the collected specimen is not from the site of an infection, but from site(s) likely to harbor MRSA (primarily nares) in a suspected asymptomatic carrier.

Doctors Laboratory offers MRSA Detection Test as a separate test. Details for ordering this test are provided below, and instructions for specimen collection from a suspected carrier are available separately.

Due to specific steps required and taken for MRSA detection, it is highly recommended that this test be ordered IN ADDITION TO routine culture from patients who are suspected of MRSA infection, along with other infectious agents.

Purpose	Test(s) to Order	Specimen to submit	CPT Code(s)
To rule-out MRSA carrier status or colonization in asymptomatic person	2254 – MRSA Detection Test	Culture swab of nares or axilla from asymptomatic suspected carrier	87081
To rule-out presence of MRSA and other infectious agents at actual infected site	204 – Wound Culture AND 2254 – MRSA Detection Test	Culture swab from the site of infection	87070 AND 87081
To rule-out presence of non-MRSA agents only at actual infected site	204 – Wound Culture	Culture swab from the site of infection	87070