

**2005 Infection Control Update:  
Practical Approaches to  
Community-Associated  
Methicillin-resistant  
*Staphylococcus aureus*  
(CA-MRSA)**

**Satellite Conference  
Wednesday, August 3, 2005  
2:00- 4:00 p.m. (Central Time)**

Produced by the Alabama Department of Public Health  
Video Communications Division

**Faculty**

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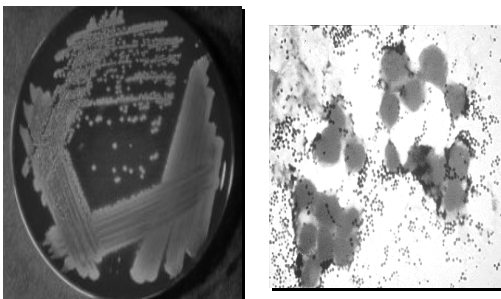
**Objectives**

- Compare the differences between community-associated (CA-MRSA) and healthcare-associated methicillin-resistant *Staphylococcus aureus* (MRSA).
- Define the terms “colonization” and “infection” as they apply to MRSA.

**Objectives**

- List the five “C” factors which have been identified as common to outbreaks of CA-MRSA.
- Identify strategies to be taken to decrease transmission of CA-MRSA.

***Staphylococcus aureus***



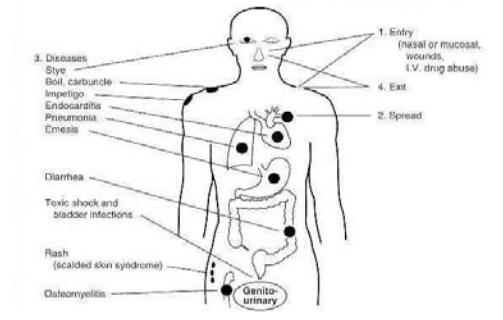
***Staphylococcus aureus***

- One of the most common causes of skin infections in the U.S.
- One of the major causes of hospital-acquired infections in the U.S.
- 40% of adults are colonized with it.
- 50-90% of health care workers are colonized with it.

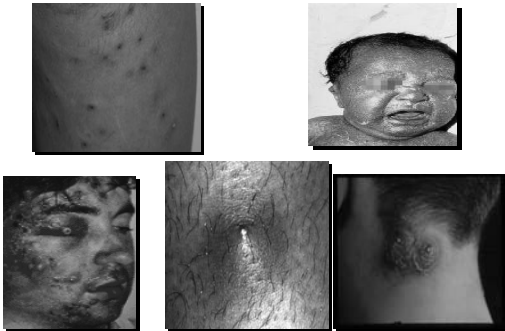
## Colonization vs. Infection

- **Colonization:**  
The organism is present in or on the body BUT....  
it usually requires no treatment and does not spread to others.
- **Infection:**  
The organism is present in or on the body AND...  
it is causing illness- there will be signs and symptoms and requires treatment.

## Staph Infections



## Staph Infections



**What is the most common mechanism of transmission for *Staphylococcus aureus* infections?**

## Antimicrobial Resistance

- Drug resistance occurs when microbes develop ways to survive the use of medicines meant to kill or weaken them.
- If a microbe is resistant to many drugs, treating the infection it causes can become difficult or even impossible.

## Methicillin

- An antibiotic commonly used to treat staph infections.
- Although very effective in treating most staph infections, some staph bacteria develop resistance to the drug and can no longer be killed by the antibiotic.

## MRSA

These resistant bacteria are called Methicillin-resistant *Staphylococcus aureus* or MRSA.

## MRSA Transmission

- Contact spread (via hands) is the *primary* means of transmission.
- Environmental contamination *may* lead to the spread of MRSA.

## Conditions Which Increase the Risk of Acquiring MRSA

- Severity of illness.
- Previous exposure to antimicrobial agents.
- Repeated contact with the healthcare system.
- Advanced age.
- Previous colonization by a multi-drug resistant organism.

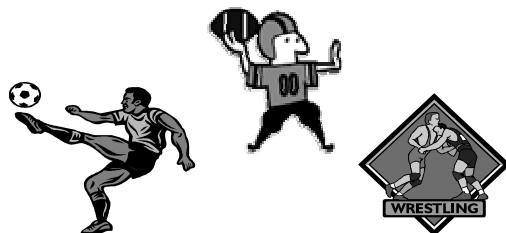
## Conditions Which Increase the Risk of Acquiring MRSA

- Underlying diseases or conditions:
  - Insulin-dependent diabetes mellitus
  - Peripheral vascular disease
  - Chronic renal disease
  - Dermatitis or skin lesions
- Invasive procedures, such as:
  - Dialysis
  - Presence of invasive devices
  - Urinary catheterization

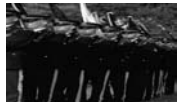
## MRSA Facts

- The exact percent of colonization of the general population is unknown.
- There is a 60% prevalence among patients in U.S. intensive care units.

## Community-Associated MRSA (CA-MRSA) Infections



## Community-Associated MRSA (CA-MRSA) Infections



## CA-MRSA Reported Outbreaks:

- Athletic teams
- Correctional facilities
- Men who have sex with men (MSM)
- Injecting drug users
- Day care facilities
- College campuses
- Military recruits
- Pacific Islanders, Alaskan Natives, and Native Americans

## CA-MRSA

- In the U.S. a little more than 10% of all MRSA infections are CA-MRSA.
- Hospitalization is required in approximately 1 out of every 5 cases.
- Causes illness in persons outside of hospitals and healthcare facilities.
- Usually in persons with no medical history of MRSA infection or colonization.

## CA-MRSA

- Diagnosis made in outpatient setting or by positive culture for MRSA within 48 hours after hospital admission.
- Usually in persons who have no permanent indwelling catheters or invasive medical devices.

## CA-MRSA

- Persons with no medical history in the past year of:
  - Hospitalization
  - Admission to a nursing home, skilled nursing facility, or hospice
  - Dialysis
  - Surgery

## Five Common “C” Factors of CA-MRSA

1. Compromised skin – abrasions from scrapes or existing skin disease.



### Five Common “C” Factors of CA-MRSA

2. Contact - frequent and very often vigorous skin-to-skin contact.

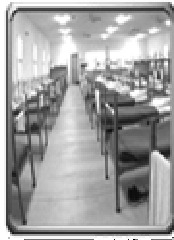


### Five Common “C” Factors of CA-MRSA

3. Contaminated surfaces and shared items:
- sports and weight-lifting equipment
  - shared towels and uniforms
  - changing tables and toys

### Five Common “C” Factors of CA-MRSA

4. Crowding –  
When people are very close to one another, it increases the likelihood of skin-to-skin contact and contamination of the environment.



### Five Common “C” Factors of CA-MRSA

5. Cleanliness –  
Often less than optimal showering conditions, lack of soap usage, and cleaning of equipment.



### MRSA

- Hospital acquired:
  - multi-drug resistance
  - infection sites: multiple
  - does not have the USA 300 clone
- Community-associated:
  - reduced drug resistance
  - infection sites: skin and soft tissues
  - has a unique clone (USA 300) commonly seen in skin & soft tissue infections

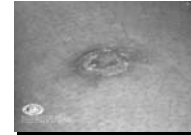
### CA-MRSA

- Recent CA-MRSA outbreak findings suggest there are some biologic properties (such as virulence factors) which may allow the CA-MRSA strains to spread more or cause more disease.
- Further studies are being done to confirm this hypothesis.

## CA-MRSA

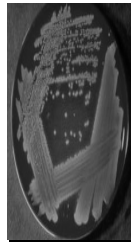
- Is there an increase in MRSA disease in the community?
- OR
- Is there an increased *awareness and recognition* of MRSA disease?

## Spider Bite?



## CA-MRSA Diagnosis

- Confirm presumptive diagnosis by sending a specimen of the infected wound (either a small biopsy of skin or a swab for culture of the drainage/pus) to a microbiology lab for culture and sensitivity.



## CA-MRSA Treatment

- Treatment will depend on the individual patient's condition.
- Often times, an I&D (incision and drainage) is all that is needed with appropriate follow-up wound care and good hygiene.

## CA-MRSA Treatment

- If antibiotics are prescribed it is most important to:
  - Take the antibiotics as prescribed.
  - Complete the entire prescription amount – do not stop taking because the wound looks/feels better.
  - Do not share antibiotics with others.
  - Some antibiotic treatments will need to be given I.V.

## Transmission Prevention

- Follow HC provider's instructions.
- Keep draining lesions covered with clean, dry dressings or bandages.
- Proper disposal of bandages.

## Transmission Prevention

- Prudent hygiene measures -  
Hand washing,  
Hand washing,  
Hand washing!!

## Transmission Prevention

- Hand hygiene:
  - An alcohol-based hand rub can be used if the hands are not obviously contaminated and at times when soap and water are not available.
  - Liquid soap, preferably an antibacterial, should be used if there is a known case of CA-MRSA in a household or among individuals who are in close contact (i.e., athletic teams, military recruits, correctional facilities, etc.)

## Transmission Prevention

- Avoid sharing personal items that may have had contact with the infected wound and potentially infectious material.
- To kill the bacteria, wash soiled linens & clothes separately in hot water with a laundry detergent.
- Dry clothes in a hot dryer.

## Transmission Prevention

- Clean the inanimate environment with a commercial disinfectant or a fresh (mixed daily) 1:100 solution of bleach and water (1 tablespoon bleach in 1 quart of water).
- Infected persons should inform all of their health care providers that they have an antibiotic-resistant *Staphylococcus aureus* skin infection.

## Transmission Prevention

- Education is most important!
- Education of:
  - healthcare professionals.
  - the lay public (including children)
  - those at high risk of acquiring infection:
    - participants of contact sports
    - correctional facility inmates
    - day care workers
    - military recruits

## Education Points:

- Importance of hand hygiene.
- Technique of good hand hygiene.
- Importance of good body hygiene.
- The 5 Common C Factors of CA-MRSA.
- The importance of taking antibiotics as prescribed.
- The importance of proper wound care.

### Five Common “C” Factors:

1. Compromised skin
2. Contact (frequent)
3. Contaminated surfaces and shared items
4. Crowding
5. Cleanliness

### CENTRIFUGE

- Has a new form been started for this calendar year?  
\_\_\_\_\_yes \_\_\_\_\_no
- Is a cover available for the centrifuge?  
\_\_\_\_\_yes \_\_\_\_\_no
- Have the RPM's been checked this year? (Done by TCs)  
\_\_\_\_\_yes \_\_\_\_\_no

### CENTRIFUGE

- If there is a timer, has the timer been calibrated?  
\_\_\_\_\_yes \_\_\_\_\_no
- Has monthly maintenance been performed?  
\_\_\_\_\_yes \_\_\_\_\_no

### REFRIGERATORS

- Is there food in the laboratory refrigerator?  
\_\_\_\_\_yes \_\_\_\_\_no
- Is it clean inside?  
\_\_\_\_\_yes \_\_\_\_\_no
- Has the temperature been documented every day the clinic is open?  
\_\_\_\_\_yes \_\_\_\_\_no

### REFRIGERATORS

- Are the temperatures within acceptable ranges?  
\_\_\_\_\_yes \_\_\_\_\_no
- If temperatures are not in range, has corrective action been documented?  
\_\_\_\_\_yes \_\_\_\_\_no

### INCUBATORS (If available in clinic)

- Is the incubator clean inside?  
\_\_\_\_\_yes \_\_\_\_\_no
- Are the climate controlled bags sealed properly?  
\_\_\_\_\_yes \_\_\_\_\_no



### INCUBATORS (If available in clinic)

- Is the temperature documented every day the clinic is open?  
\_\_\_\_\_yes \_\_\_\_\_no
- Are the temperatures within acceptable range?  
\_\_\_\_\_yes \_\_\_\_\_no

### EXPIRATION DATES

- Are the following within acceptable dates?
- Blood collection tubes \_\_\_\_\_yes \_\_\_\_\_no
- Urine pregnancy tests \_\_\_\_\_yes \_\_\_\_\_no
- CO2 ampules \_\_\_\_\_yes \_\_\_\_\_no
- HemoCue cuvettes \_\_\_\_\_yes \_\_\_\_\_no
- GC media \_\_\_\_\_yes \_\_\_\_\_no
- Urine dipsticks \_\_\_\_\_yes \_\_\_\_\_no
- Chlamydia swabs \_\_\_\_\_yes \_\_\_\_\_no
- Gonostat swabs \_\_\_\_\_yes \_\_\_\_\_no

### HEMOCUE

- Is it documented that the HemoCue has been cleaned every day of use?  
\_\_\_\_\_yes \_\_\_\_\_no
- Is there visible blood or serous fluid on the outside of the HemoCue?  
\_\_\_\_\_yes \_\_\_\_\_no  
– If so question the maintenance log. This blood should be removed during daily cleaning.

### HEMOCUE

- Is the monthly maintenance documented?  
\_\_\_\_\_yes \_\_\_\_\_no
- Is there corrective action documented for any problems that caused a delay in patient testing?  
\_\_\_\_\_yes \_\_\_\_\_no  
– Any problems you have with your HemoCue should be documented on the HemoCue chart.
- Are temperatures recorded in each room that contains a HemoCue?  
\_\_\_\_\_yes \_\_\_\_\_no

### MICROSCOPE

- Is there documentation that the optics have been cleaned daily?  
\_\_\_\_\_yes \_\_\_\_\_no
- Is there documentation that the microscope was covered at the end of each day?  
\_\_\_\_\_yes \_\_\_\_\_no
- Is there documentation that KOH has been checked for contamination?  
\_\_\_\_\_yes \_\_\_\_\_no

### MICROSCOPE

- Is there documentation that saline has been checked for contamination?  
\_\_\_\_\_yes \_\_\_\_\_no
- Is there a spare bulb available for your microscope?  
\_\_\_\_\_yes \_\_\_\_\_no
- Do you have lens paper? Anything else will damage the lens.  
\_\_\_\_\_yes \_\_\_\_\_no

### **MICROSCOPE**

- Do you have lens cleaner?  
Microscope does not get clean without it.  
\_\_\_\_\_yes\_\_\_\_\_no
- Is the annual professional microscope cleaning documented on the microscope maintenance chart?  
\_\_\_\_\_yes\_\_\_\_\_no

### **RPR ROTATOR**

- Is there documentation that the rotator was cleaned monthly?  
\_\_\_\_\_yes\_\_\_\_\_no
- Is there documentation that the rotation circumference was checked quarterly?  
\_\_\_\_\_yes\_\_\_\_\_no
- Is there documentation that the timer was calibrated quarterly?  
\_\_\_\_\_yes\_\_\_\_\_no

### **RPR ROTATOR**

- Are STD logs up to date with all required information?  
\_\_\_\_\_yes\_\_\_\_\_no
- Is control information complete on the STD patient log?  
\_\_\_\_\_yes\_\_\_\_\_no
- Are all STD laboratory records easily retrievable? \_\_\_\_\_yes\_\_\_\_\_no

### **DARKFIELD MICROSCOPE**

- Is there documentation that the optics have been cleaned daily?  
\_\_\_\_\_yes\_\_\_\_\_no
- Is there documentation that the microscope was covered at the end of each day?  
\_\_\_\_\_yes\_\_\_\_\_no
- Is there a spare bulb available for your microscope?  
\_\_\_\_\_yes\_\_\_\_\_no

### **DARKFIELD MICROSCOPE**

- Do you have lens paper? Anything else will damage the lens.  
\_\_\_\_\_yes\_\_\_\_\_no
- Do you have lens cleaner?  
Microscope does not get clean without it.  
\_\_\_\_\_yes\_\_\_\_\_no

### **DARKFIELD MICROSCOPE**

- Is the annual professional microscope cleaning documented on the microscope maintenance chart?  
\_\_\_\_\_yes\_\_\_\_\_no
- Is immersion oil available?  
\_\_\_\_\_yes\_\_\_\_\_no

### **County Clinic Personnel**

- Please list all personnel performing laboratory testing, including CRNP's, RN's, Clinic Aides, and Laboratory Technicians if available.

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- Please update and send to the Quality Management Office whenever you have personnel changes.

### **Upcoming Programs**

**Exam Documentation:  
Adopting A Risk Management Mindset  
Thursday, August 4th  
2:00 - 4:00 p.m.**

**Avian Influenza: Implications for  
Agriculture and Public Health  
Tuesday, August 9th  
12:00 - 1:30 p.m.**

**For a complete listing of  
upcoming programs visit:  
[www.adph.org/alphtn](http://www.adph.org/alphtn)**