

**Rochester Institute of Technology  
Student Health Center**

**Resistant “Staph” Infections - MRSA**

**BACKGROUND**

*Staphylococcus aureus* (S aureus or “staph”) is one of the most common bacteria in skin and other soft tissue infections; some strains are also associated with serious, life-threatening infections. Penicillin was introduced in the 1940s and proved to be a powerful antidote to “staph” infections. However, resistance quickly emerged. Newer, stronger antibiotics were developed, including a semi-synthetic penicillin called methicillin, which overcome this problem. Success, however, was short-lived and by the mid-1960s methicillin-resistant S. aureus (MRSA) was widespread in hospitals and other long term care facilities in the US and around the world. MRSA refers to these strains of staph bacteria, which cannot be treated with methicillin or other usual medications.

**CAUSES OF ANTIBIOTIC RESISTENCE**

Bacteria have unique methods for developing the ability to resist treatment. However, the behavior of patients and health care providers contribute to a great extent to the continual emergence of resistant strains of bacteria. Leading causes include:

- Unnecessary antibiotic use: MRSA, like other so called “superbugs” has evolved in the context of decades of unnecessary antibiotic use. Too often antibiotics are prescribed for colds and flu, which are viral infections and are not cured by medicines.
- Antibiotics in food and water: Antibiotics are found widely in our environment in the US as farmers supplement feed with these drugs. So we all are exposed to more antibiotics than simply when a health care provider prescribes medicine.
- Genetic mutation: All human exposure to antibiotics promotes the development of bacterial resistance. No medicine kills all the targeted bacteria and those which remain are “selected” because they contain genetic material which allows resistance to the killing action of the antibiotic. Bacteria evolve and alter their genetic make up much more quickly than higher organisms and faster than scientists can design new antibiotics.

**STAPHYLOCOCCUS IN HUMANS**

“Staph” bacteria are normally found on the skin or in the mucous lining of the nose. A person with “staph” on the skin or in the nasal passages but who is not

ill is said to be a “colonized” carrier but not infected. Approximately 20% of healthy persons are persistent carriers and 60 % are intermittent carriers of Staph aureus. Colonization rates tend to be higher in patients with chronic health problems such as individuals on dialysis or with insulin dependant diabetes.

Generally, “staph” bacteria are harmless unless they enter the body through a cut or break in the skin. Even then, in healthy individuals, only minor skin problems result. However, persons with weakened immune systems and older adults may develop serious and complicated illnesses and some of these are caused by the resistant, MRSA, strain of the bacteria.

### **COMMUNITY ACQUIRED MRSA (CA-MRSA)**

In the 1990s, a type of MRSA was noted in the wider community, rather than just in hospitalized patients. Over the past two decades the incidence of these infections has risen. The strain of “staph” responsible is termed: CA-MRSA, or community acquired MRSA. CA-MRSA is genetically different from resistant “staph” which occurs in the hospital setting. It commonly causes skin and soft tissue infections; many times these are simple abscesses or boils, which can be treated with antibiotics or drainage; rarely these infections evolve into deep tissue (bone or lung) infections or widely spread (blood stream) infections and are potentially life-threatening.

### **RISK FOR COMMUNITY-ACQUIRED MRSA**

- Young age.
- Compromised immune system.
- Participation in contact sports and the sharing of razors, towels or other equipment by athletes.
- Living in crowded and/or unsanitary housing conditions.
- Close association with individuals who work in hospitals or other long term care facilities.

### **RISK FOR HOSPITAL-ACQUIRED MRSA**

- A recent hospitalization.
- Residing in a long-term care facility such as a nursing home.
- Presence of indwelling catheters or other devices, such as feeding tubes.
- Treatment with strong, broad-spectrum antibiotics.

### **HOW IS CA-MRSA TRANSMITTED?**

- Direct skin to skin contact.
- Contact with items shared by individuals who are carriers or infected.

## **SETTINGS WHERE CA- MRSA INFECTIONS OCCUR**

- CA-MRSA infections occur in all communities.
- CA-MRSA skin infections are more likely to occur in crowded living situations and where there is lack of cleanliness.
- CA-MRSA is more likely to occur in situations where there is frequent skin to skin contact and especially if there are breaks in the skin, i.e. cuts or abrasions.

## **PROTECTION FROM CA-MRSA INFECTIONS**

- Hand washing – careful and frequent hand washing remains the best defense against the spread of infection. Scrub hands vigorously with soap for 15 seconds and then dry with a clean or disposable towel. When soap and water are not available, use an alcohol based hand sanitizer.
- Wound Care – Keep cuts and abrasions clean and covered until fully healed. Drainage from wounds may contain bacteria and covering them minimizes the spread of germs to others.
- Avoid sharing personal items – Keep items such as towels, sheets, razors, clothing and athletic equipment for own personal use; sharing these items may serve as a vector for the spread of germs to others.
- Maintain a clean environment – Establish cleaning routines, especially for surfaces that touch others' skin. Regularly wash linens and towels and if a cut or sore is still healing, use hot water and bleach in the laundry cycle. Wash gym and athletic clothes after each use.

**Following the guidelines above will help keep the RIT community safer.**

**For additional questions, please contact the Student Health Center at 475-2255.**

**The following are credible web based sources of information:**

**The CDC:** <http://www.cdc.gov>

**The Mayo Clinic:** <http://www.mayoclinic.com>

**Medline Plus:** <http://www.nlm.nih.gov/medlineplus>