M R S A

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A. Definition of M R S A

- Methicillin resistant Staphylococcus Aureus (M R S A) is a bacterium responsible for several difficult to treat infections in humans. It may also be called multidrug resistant Staphylococcus Aureus or oxacillin resistant Staphylococcus Aureus (O R S A)
- M R S A is by definition any strain of Staphylococcus Aureus that has developed resistance to beta-lactam antibiotics which include penicillins, methicillin, dicoloxacillin, nafcillin, oxacillin, etc. And the cephalosporins.
- M R S A is especially troublesome in hospitals and nursing homes where patients with open wounds, invasive devices and weakened immune systems are at greater risk of infection than the general public.
- C A M R S A (Community Acquired) is more easily treated, though more virulent, than H A M R S A (Hospital Acquired)/
- Most of the hybrid strains also acquired a factor that increases their virulence, resulting in the development of deep tissue infections from minor scrapes and cuts as well as many cases of fatal pneumonia.

Signs and Symptoms

- Staph Aureus most commonly colonizes the anterior nares (nostrils), although the rest of the respiratory tract, open wounds, intravenouss catherters and urinary tract are also potential sites for infection.
- Healthy individuals may carry M R S A asymptomatically for periods ranging from a few weeks to many years.
- Patients with compromised immune systems are at a significantly greater risk of symptomatic secondary infection.
- *MRSA may progress substantially within 24–48 hours of initial topical symptoms. After 72 hours MRSA can take hold in human tissues and eventually become resistant to treatment. The initial presentation of MRSA is small red bumps that resemble pimples, spider bites, or boils that may be accompanied by fever and occasionally rashes. Within a few days the bumps become larger, more painful, and eventually open into deep, pus-filled boils.[3] About 75 percent of community-associated (CA-) MRSA infections are localized to skin and soft tissue and usually can be treated effectively. However, some CA-MRSA strains display enhanced virulence, spreading more rapidly and causing illness much more severe than traditional healthcare-associated (HA-) MRSA infections, and they can affect vital organs and lead to widespread infection (sepsis), toxic shock syndrome and necrotizing ("flesh-eating") pneumonia. This is thought to be due to toxins carried by CA-MRSA strains, such as PVL and PSM, though PVL was recently found to not be a factor in a study by the National Institute of Allergy and Infectious Diseases (NIAID) at the NIH. It is not known why some healthy people develop CA-MRSA skin infections that are treatable whereas others infected with the same strain develop severe infections or die.[4] The bacteria attack parts of the immune system, and even engulf white blood cells, the opposite of the usual.[4]*
- *The most common manifestations of CA-MRSA are skin infections such as necrotizing fasciitis or pyomyositis (most commonly found in the tropics), necrotizing pneumonia, infective endocarditis (which affects the valves of the heart), or bone or joint infections.[5] CA-MRSA often results in abscess formation that requires incision and drainage. Before the spread of MRSA into the community, abscesses were not considered contagious because it was assumed that infection required violation of skin integrity and the introduction of staphylococci from normal skin colonization. However, newly emerging CA-MRSA is transmissible (similar, but with very important differences) from Hospital-Associated MRSA. CA-MRSA is less likely than other forms of MRSA to cause cellulitis.*

What does it look like?

- Cellulitis – abscess or draining pus, usually starts with small red bumps in skin.
- Boils – Pus filled infections of hair follicles.
- Sty – Infection of the eyelid gland.
- Carbuncles – Infections larger than an abscess, usually with several openings to the skin.
- Impetigo – A skin infection with pus filled blisters.
- Many times the red bumps on the skin are mistaken for spider bites.

Symptoms

- Fever
- Pneumonia
- Headache
- Sepsis
- The pimple or boil can be red, swollen, painful or have drainage

Symptoms

- The symptoms of M R S A depend on where your infected. Most often it causes mild infections on the skin causing sores or boils. It can also cause more serious skin infections or infect surgical wounds, the bloodstream, the lungs or the urinary tract. Though most M R S A infections aren't serious, some can be life threatening. Many publiic health experts are alarmed by the spread of the tough strains of M R S A because it is hard to treat.
- M R S A is sometimes called the "Super Bug".

How is M R S A Spread?

- M R S A is spread by contact. So you could get M R S A by touching another person who has it on their skin or you could get it by touching objects that have bacteria on them.
- M R S A is carried or "colonized" by about 1% of the population, although most of them aren't infected.
- ***Risk factors***
- *At risk populations include:*
- *People with weak immune systems (people living with HIV/AIDS, cancer patients, transplant recipients, severe asthmatics, etc.)*
- *Diabetics*
- *Intravenous drug users*
- *Use of quinolone antibiotics[6]*
- *Young children*
- *The elderly*
- *College students living in dormitories*
- *People staying or working in a health care facility for an extended period of time*
- *People who spend time in coastal waters where MRSA is present, such as some beaches in Florida and the west coast of the United States[7][8]*
- *People who spend time in confined spaces with other people, including prison inmates, military recruits in basic training,[9] and individuals who spend considerable time in changerooms or gyms*

Risks from contaminated surfaces

- In healthcare enviornments, M R S A can survive on surfaces and fabrics, including privacy curtains or garments worn by care providers. Complete surface sanitation is necessary to eliminate M R S A in areas where patients are recovering from invasive procedures.
- We use Virex at our facility.
- If you wash your hand after touching surfaces and didn't wear gloves, you most likely will not contract M R S A - unless you touch your mouth, eyes or have an open cut on your hand.

How M R S A is Spread

- **How MRSA is Spread in the Community**
- MRSA infections, as with all staph, are usually spread by having contact with someone's skin infection or personal items they have used, like towels, bandages, or razors that touched their infected skin. These infections are most likely to be spread in places where people are in close contact with others—for instance, schools and locker rooms where athletes might share razors or towels.
- Factors that have been associated with the spread of MRSA skin infections include: close skin-to-skin contact, openings in the skin such as cuts or abrasions, contaminated items and surfaces, crowded living conditions, and poor hygiene. People may be more at risk in locations where these factors are common, including: athletic facilities, dormitories, military barracks, households, correctional facilities, and daycare centers.

Risks from Contaminated Surfaces

- **Risks from Contaminated Surfaces**
- MRSA is found on people and not naturally found in the environment (e.g., soil, the ocean, lakes). MRSA could get on objects and surfaces outside the body if someone touches infected skin or certain areas of the body where these bacteria can live (like the nose) and then touches the object or surface. Another way that items can be contaminated with staph and MRSA is if they have direct contact with a person's skin infection. Keeping skin infections covered with bandages is the best way to reduce the chance that surfaces will be contaminated with MRSA.
- Even if surfaces have MRSA on them, this does not mean that you will definitely get an infection if you touch these surfaces. MRSA is most likely to cause problems when you have a cut or scrape that is not covered. That's why it's important to cover your cuts and open wounds with bandages. MRSA can also get into small openings in the skin, like the openings at hair follicles. The best defense is good hygiene. Keep your hands clean, use a barrier like clothing or towels between you and any surfaces you share with others (like gym equipment) and shower immediately after activities that involve direct skin contact with others. These are easy ways to decrease your risk of getting MRSA.

Environmental Cleaning and Disinfecting for M R S A

- To prevent the spread of staph or M R S A in the workplace, employers should ensure the availability of adequate facilities and supplies that encourage workers to practice good hygiene; that surface sanitizing in the workplace is followed; that contaminated equipment are sanitized with Environmental Protection Agency (E P A) registered disinfectants.
- Alcohol has also been proven to be an effective surface sanitizer against M R S A.
- Larger surfaces such as floors and walls have not been directly associated in the spread of Staph and M R S A.

Prevention of M R S A Infections

1. Isolation
2. Hand washing
    1. Keep your hands clean by:
        1. Washing well with soap and water or using an alcohol based hand gel
        2. Keep cuts and scrapes clean and covered with a bandage until healed.
        3. Avoid contact with other peoples wounds or bandages.
        4. Avoid sharing personal items such as towels or razors.
3. Screening Programs
4. Surface Sanitizing

Quicker recognition of M R S A leads to faster recovery as with some other bacteria, M R S A is acquiring more resistance to some disinfectants and antiseptics. Although alcohol based rubs remain somewhat effective a more effective strategy is to wash hands with running water and anti microbial cleanser with persistent killing actions, such as Chlorhexidine.

Decolonization - after the drainage of boils or other treatment for M R S A, patients can shower at home using Chlorhexidine (Hibiclens) or Phisohex.

How is M R S A diagnosed?

- Culture- set up onto culture plates from throat or wound.
- Incubate for 24 hours.
- After 24 hours take off plate and do a gram stain to grow bacteria on slide.
- Stain and look under microscope to tell if staph is gram + cocci.
- Mic setup to determine M R S A.
- Sets another 24 hours before it is read to see if it is resistant to methicillin.
- If methicillin doesn't kill it, it is resistant + M R S A.