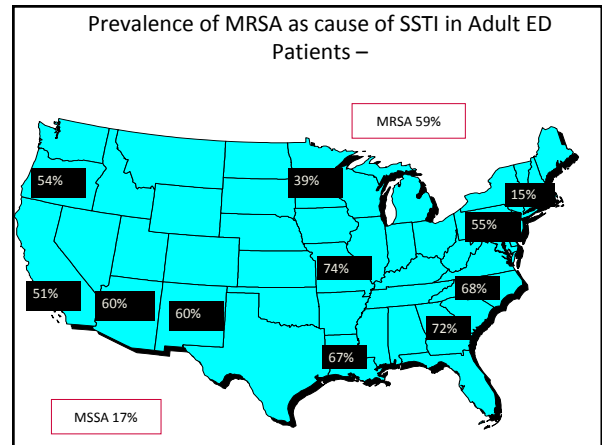


MRSA: Implications in Primary Care

Ben Taylor, PhD, PA-C

- ### MRSA (Methicillin-Resistant Staph Aureus)
- Staph” infections have been around since the beginning of history.
 - “Because so many antibiotics have been used in recent years, the bacteria are now starting to become resistant, and this created MRSA
 - MRSA infections have been a problem in hospitals for several years
 - Has surfaced in community
 - Such infections are generally mild
 - Pimples or boils
 - Red, Painful, swollen, drain pus
 - Typically single not multiple
 - Occurs in otherwise healthy people
 - Staph is common on most people
 - Can commonly live on the skin or in their nose

- ### MRSA
- Caused more than 94,000 life-threatening infections and nearly 19,000 deaths in 2005
 - Most associated with healthcare settings
 - Most frequent among people with weakened immune systems



Total Population: ~ 16.3 million

| State | Counties | Population | Reporting Status |
|-------|---|------------|-----------------------|
| CA | 3 counties | 3.2 M | |
| CO | 5 counties (metro Denver) | 2.1 M | Reportable |
| CT | Statewide | 3.5 M | Reportable |
| GA | 8 counties (Fulton, DeKalb, Clayton, Gwinnett, Cobb, Douglas, Rockdale, Newton) | 3.3 M | Reportable if severe* |
| MD | Baltimore | 651 K | |
| MN | 1 county (Ramsey) | 506 K | Reportable |
| NY | 1 county (Monroe) | 2.1 M | |
| OR | 3 counties (metro Portland) | 1.5 M | |
| TN | 1 county (Davidson) | 570 K | Reportable |

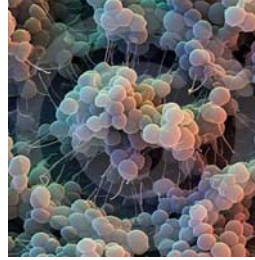
* Hospitalization or death

- ### MRSA
- ***Staphylococcus aureus***, often referred to as “staph”, are bacteria commonly carried on the skin or in the nose of healthy people

Staphylococcus Aureus

- Occasionally, staph can cause an infection
- Staph bacteria are one of the most common causes of skin infections in the US
- Most of these infections are minor
 - pimples, boils
- Most can be treated without antibiotics
- However, staph infections can cause serious infections
 - surgical wound infections, pneumonia

Where are staph and MRSA found ?



- Staph and MRSA bacteria can be found on the skin and in the nose of some people without causing illness.

What is the difference between colonization and infection ?

- **Colonization** occurs when the staph bacteria are present on or in the body without causing illness
 - ~25-30% of the population is colonized in the nose with staph bacteria at a given time

What is the difference between colonization and infection ?

- **Infection** occurs when the staph bacteria cause disease in the person
 - People also may be colonized or infected with MRSA, the staph bacteria that are resistant to many antibiotics

What Problems does MRSA cause?

- Staph bacteria can cause different types of illness
 - skin infections, bone infections, pneumonia, severe life-threatening bloodstream infections, and other illnesses
- Since MRSA is a staph bacterium, it can cause the same types of infections as staph in general; however, MRSA occurs more commonly among persons in hospitals and healthcare facilities

Who gets MRSA?

- MRSA infection usually develops in hospitalized patients:
 - elderly
 - very sick
 - open wound
 - tube going into body
 - IV or catheter
- MRSA infections acquired in hospitals and healthcare settings can be severe

Who gets MRSA?

- Certain factors can put some patients at higher risk for MRSA:
 - prolonged hospital stay
 - receiving broad-spectrum antibiotics
 - being hospitalized in an intensive care or burn unit
 - spending time close to other patients with MRSA
 - recent surgery
 - carrying MRSA in nose without developing illness

Who gets MRSA?

- MRSA causes illnesses in persons outside of hospitals and healthcare facilities as well
- Cases of MRSA diseases in the community have been associated with:
 - Injecting drug users
 - Prostitutes
 - Incarcerated persons
 - Players of close contact sports

Community-Associated MRSA

- Community-associated MRSA infections are typically skin lesions, but can also cause severe illness
- Most of transmissions appear to be from people with active MRSA skin infections

Differential Diagnosis

- Streptococcal ecthyma
- *Pseudomonas* folliculitis
- Herpes simplex infections
- Ruptured epidermoid cysts
- Foreign body reactions
- Hidradenitis suppurativa
- Necrotizing fasciitis
- Pyomyositis
- Tinea infections including deep infections
- Rickettsialpox (endemic areas)
- Arthropod bites

What to Look For

- Abscesses
- Follicular pustules
- Furuncles (boils)
- Bullous impetigo – pus or fluid-filled bullae and vesicles
- Non-bullous impetigo – crusted plaques and erosions
- Cellulitis – circumscribed erythema and/or edema, tissue warmth, and tenderness
- MRSA skin infections present similarly as any bacterial skin infections with the exception of severity. Skin abscesses caused by MRSA can often appear larger and more severe than the typical methicillin-sensitive abscess.

Diagnostic Pearls

- In most geographic areas, assume MRSA when there are severe furuncles or abscesses.
- Consider MRSA in almost any skin or soft tissue infection.
- Many patients believe they were bitten by a spider despite not having seen the spider or felt the bite.

Is it a spider bite?




IF YOU THINK YOU HAVE A SPIDER BITE, IT MIGHT ACTUALLY BE AN INFECTION THAT NEEDS MEDICAL ATTENTION.

When in doubt, check it out.

MRSA


- May live on surfaces contaminated with body fluids containing MRSA

Sharing isn't always caring.



SHARING PERSONAL ITEMS LIKE TOWELS, RAZORS, OR TWEEZERS CAN SPREAD DISEASES.

Don't open the door to infection.



ANY OPENING IN YOUR SKIN INCREASES THE RISK OF INFECTION.

Keep your cuts, scrapes, and scratches
Clean
Dry and
Covered!

Primary Means of Transmission

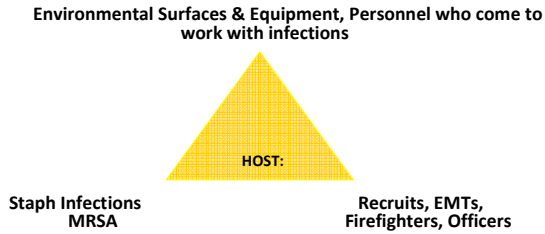
- Skin-to-skin contact
- Crowded conditions
- Poor hygiene
- Sharing of Personal Items

Reduce the Risks of Disease Transmission through....

PREVENTION

By altering one component of the triangle, one or more of the other components may be changed

Environmental Surfaces & Equipment, Personnel who come to work with infections



Staph Infections MRSA

Recruits, EMTs, Firefighters, Officers

Alter the Environment

- Hygiene Practices
 - Keep cuts & scrapes clean and covered
 - Do not touch other people's cuts & bandages w/o gloves
 - Do not share personal items
 - Towels, soap, razors, tweezers, sports equipment, ball caps, linen etc.
 - Shower after strenuous activities
- Hand Hygiene
 - Wash your hands
 - Liquid soap and water is best
 - Waterless hand sanitizer if soap & water is not available
 - Hand soap is not recommended
- Cleaning
 - Clean surfaces with a disinfectant that will kill Staph such as Cidex II, DisCide Ultra or a 1:100 bleach solution (mixed every 24 hrs)
 - Don't forget to decon mop heads and buckets



LYSOL® Brand IC™ Quaternary Disinfectant Cleaner (Concentrate)


- Effective cleaner and disinfectant that kills odor-causing bacteria.
- Highly concentrated, cost-effective formula dilutes at 1:256.
- **Virucidal, Fungicidal and Bactericidal*.**
- Effective against HIV-1, VRE, MRSA and other gram-positive as well as gram-negative microorganisms.
- Neutral pH in use.
- EPA Registration No. 47371-129-675

* In the presence of 5% organic matter

| Bacteria | Fungi | Viruses |
|---|---|---|
| Salmonella choleraesuis Salmonella enteritidis Staphylococcus aureus Acinetobacter baumannii Salmonella typhi Serratia marcescens Salmonella typhimurium Streptococcus pyogenes Shigella flexneri Streptococcus faecalis Enterobacter aerogenes Streptococcus faecalis Proteus vulgaris Chlamydia psittaci Enterococcus faecalis Bordetella bronchiseptica Escherichia coli Enterobacter cloacae | Fusobacterium necrophorum Pseudomonas aeruginosa Listeria monocytogenes Klebsiella pneumoniae Pasteurella multocida Pseudomonas aeruginosa Proteus mirabilis Staphylococcus aureus Shigella sonnei Staphylococcus aureus Staphylococcus epidermidis | Herpes Simplex Type 1 Herpes Simplex Type 2 Vaccinia Influenza A/Hong Kong HIV-1 (AIDS virus) Adenovirus type 4 Respiratory Syncytial Virus (RSV) Transmissible Gastroenteritis Virus (TGE) Rubella (German Measles) Infectious Bronchitis (Avian IBV) |
| | Candida albicans Aspergillus niger Trichophyton mentagrophytes | Animal Viruses Canine Distemper Feline Leukemia Infectious Bovine Rhinotracheitis Feline Picornavirus Pseudorabies Rabies |

MRSA Treatment

- Empiric therapy with pcn's or cephalosporins is inadequate.
- Incision and drainage
 - Culture wound



ABX Therapy

- Clindamycin 300–450 mg p.o. 3 times daily (adults), or 30 mg/kg/d in 3–4 divided doses (children)
- Trimethoprim-sulfamethoxazole 1–2 double strength tabs p.o. twice daily (adults), or trimethoprim, 8–12 mg/kg/day, and sulfamethoxazole 40–60 mg/kg/day in 2 divided doses (children)
- Doxycycline or minocycline 100 mg p.o. 2 times daily (adults), or 2–4 mg/kg/day in 2 divided doses (children, use 4 mg/kg/day for minocycline); note tetracyclines are contraindicated in children less than 9 years of age.
- Clindamycin 600 mg IV every 8 hours or 300–450
- Rifampin 600 mg/d PO/IV with other antibiotics (Children: use 15 mg/kg/d PO/IV divided q12h with other antibiotics)

ABX Therapy

- Critically ill patients with MRSA or suspected MRSA should receive:
 - Vancomycin, linezolid, or daptomycin:
 - Vancomycin 30 mg/kg/day IV divided twice daily (adults), or 40 mg/kg/day, in 3–4 divided doses (children)
 - Linezolid 600 mg IV or p.o. every 12 hours (adults), or 30 mg/kg/day in 2–3 divided doses (children)
 - Daptomycin 4 mg/kg IV every 24 hours (adults); dosing unknown in children
- **Use drug combinations**
 - Clindamycin, trimethoprim-sulfamethoxazole (TMP-SMX), rifampin, or a quinolone
 - TMP-SMX and rifampin

Supportive Therapy

- **Bactroban: apply to nares bid x 14 days**
- **Hibiclens: head to toe bath**
- **Wash all bedding/clothes in dilute bleach solution**

Summary

Education is key.
 Educate your clinic staff and your patients.
 Educate thoroughly and frequently.
 Provide the best materials available for hand washing and cleaning of your facility.
DON'T USE KEFLEX UNLESS YOU HAVE A NIDUS FOR THE INFECTION!

CDC.gov (Center for Disease Control)