

**Session Summary for 20 February 2018**

Didactic: MRSA, Paul Pottinger, MD.

1. **Staph aureus**
   1. Staph = Clusters
   2. Aureus = Golden color on blood agar plates
   3. GPC in clusters.
2. **PRSA = Penicillin Resistant Staph aureus.**
   1. Penicillin (PCN) discovered in 1928 and cures S. aureus in WWII (1942). 1950s and S. aureus has already developed PCN resistance. 1959 and Methylated PCN (Methicillin) is developed to kill PRSA.
   2. Mechanism of resistance in PRSA: Penicillinase.
3. **MRSA = Methicillin Resistant Staph aureus:**
   1. mecA encodes an altered Penicillin Binding Protein, an enzyme that crosslinks peptidoglycan chains in cell walls. New PBP is called PCP2a.
   2. MRSA is first described in Europe in 1961. 1968 MRSA found in the US in a Boston hospital. 1974 and 2% of US nosocomial Staph infections are MRSA. 1981 community acquired MRSA, CA-MRSA, is discovered. 1997 and 50% of US nosocomial staph infections are MRSA. 2008 and 19,000 people in the US died that year from MRSA infection.
   3. CA-MRSA commonly produces Panton-Valentin Leukocidin, PVL, and causes skin and soft tissue infections.
   4. HA-MRSA (hospital acquired MRSA) commonly causes lung and blood infections.
4. **VISA = Vancomycin Intermediate Staph Aureus**. MIC 4-8 mcg/mL. Mechanism is thickened cell wall in staph aureus.
5. **VRSA = Vancomycin Resistant Staph Aureus.** Gene transfer of VanA gene from VRE and mecA gene from MRSA creates a change in the cell wall peptidoglycan from D-ala-D-ala to D-ala-D-lac, making it resistant to vanco.

Mini-case of a woman with osteomyelitis of her hand with MRSA. Difficulty adhering to Q12H IV vanco and difficulty with monitoring troughs. Can she be treated with something else?

1. Excellent data for treatment of osteomyelitis with oral antibiotics.
   1. Preferred oral regimens if the isolate is susceptible include high dose TMP/SMX (2 DS tabs po BID), clindamycin, or a fluoroquinolone (though would caution monotherapy with a FQ if source control not achieved).
   2. Updated Cochrane Review: 2013: Antibiotics for treating chronic osteomyelitis in adults
      1. A helpful Cochrane Review including 8 small and heterogeneous studies involving 282 adults with chronic osteomyelitis. There was no evidence of a difference in outcomes between parenteral antibiotic therapy and oral antibiotic therapy. Data suggests that the route of administration does not matter so long as the isolate is susceptible and the oral antibiotic is known to have good bone penetration. A more robust prospective RCT from Europe, called OVIVA, should be available soon.