

## ***Staphylococcus pseudintermedius*: Look What the Dog Dragged In?**

Authors: Carey-Ann D. Burnham<sup>1\*</sup>, Brian V. Lubbers<sup>2</sup>

1. Washington University School of Medicine, Department of Pathology & Immunology, St. Louis, MO
2. Kansas State Veterinary Diagnostic Laboratory, Department of Diagnostic Medicine / Pathobiology, Kansas State University, College of Veterinary Medicine, Manhattan, KS

### **One Health Educational Framework**

The proposed case study will address the component of Microbiologic Influences on Health and Disease with specific emphasis on both antimicrobial resistance and the emergence of disease at the cross species (human and animal) boundary.

### **Target Student Audience(s)**

The target audience for this case study would be: Students in Professional Degree (DVM, MD, etc.), upper division undergraduate courses, medical technologist students, Clinical Pathology Residents, and Clinical Microbiology Fellows.

### **Case Synopsis**

A 36 year old man fractured his left humerus in a bicycling accident. Several weeks later, he presented to his physician with drainage from a sinus tract at the site of the fracture. A culture was performed on the exudate and *Staphylococcus pseudintermedius* was recovered from the specimen.

Although *S. pseudintermedius* can be a member of the oral, nasal and skin flora of healthy dogs it is also the leading cause of skin and soft tissue infections in dogs. The true incidence of *S. pseudintermedius* infection in humans is unknown, but is likely underestimated. This is attributed to the fact that the traditional methods used in human clinical microbiology laboratories would be likely to misidentify these isolates as *Staphylococcus aureus*. With the introduction of Matrix Assisted Laser Desorption Ionization Time-of-Flight Mass Spectrometry (MALDI-TOF MS) as a diagnostic tool, it is becoming clear that *S. pseudintermedius* is indeed a cause of human infections. This is clinically significant as the methodologies to predict beta-lactam susceptibility differ for *S. aureus* and *S. pseudintermedius*.

We will use this scenario to introduce concepts in microorganism identification in human and veterinary microbiology laboratories, mechanisms of methicillin resistance, and methods to detect this resistance in the laboratory. We will contrast traditional microbiological methods with MALDI-TOF MS, and emphasize how this is informing new biological insights. In addition, we will discuss approaches to *S. aureus* and *S. pseudintermedius* in pets and in humans, and the benefits and potential limitations of decolonization as a preventative measure.