Staphylococcus

We are going to explore the genus of micro-organisms known as Staphylococcus starting with coagulase negative staphylococci. Staphylococci are gram positive cocci that comprise about 40 species. Staphylococci are often part of the normal flora, are common causes of healthcare associated infections, and resistance in the staphylococcal species toward certain groups of antibiotics appears to be increasing. We may have believed these are concerns primarily for hospitals but health care delivery and associated risks continues are now a part of ASC’S!!!

**Coagulase positive species:** Staphylococcus Aureus

**Coagulase Negative Species:** Staphylococcus epidermidis, S. hemolyticus, S. saprophyticus, S. ludgenesis, S. hominis, S. warneri

**Coagulase Negative Staphylococcus**

There are currently more than 30 species of coagulase negative staph. They tend to be more resistant to antimicrobials than S. aureus but are considered to be less virulent. S. epidermidis, S. hemolyticus and S. hominis are found on the skin. S. saprophyticus has the ability to adhere to the urinary tract epithelial cells and cause infections.
Most health care associated infections with these organisms occur in association with a foreign body or indwelling/implanted devices such as intravenous catheters, CSF shunts, prosthetic valves, temporarily and permanently implanted devices and vascular grafts. The sources of these organisms are the patient’s own flora but there is evidence of transmission among patients. The surgical procedures for implanting some of these devices may not be done in an ASC but patients presenting to an ASC for a surgical procedure may already have these devices in place.

Infections caused by coagulase negative staph tend to be more gradual in onset and less severe than infections caused by S. aureus. The infections may develop slowly and have minimal signs and symptoms.

These organisms are a common cause of infections involving vascular grafts, and post-operative endophthalmitis. Some syndromes associated with S. epidermidis include fibrous and capsular contracture syndrome after breast augmentation with silicone prostheses and late-onset endophthalmitis after implantation of intra-ocular lenses.

During foreign body infections with S. epidermidis the bacteria attach to the surfaces then accumulate and may form a thick biofilm. Micro-organisms contained within a biofilm makes infections more difficult to treat because the biofilm shields micro-organisms from antimicrobial medications. S. lugdunensis also has the ability to form bio-films and interact with prosthetic surfaces

The majorities of clinical coagulase negative strains are resistant to methicillin and they require treatment with medications such as Vancomycin. Because of the tendency for biofilm formation with these infections, the decision must be made whether to remove the foreign body/device.

Can these be a concern with procedures done in ASCs? Absolutely, these organisms can infect surgical incisions and devices implanted in any surgical setting. How do we protect our ASC patients from post-operative infections? There are infection prevention reasons for the practices we typically follow; a few of these practices are listed here. Hand hygiene reduces the risk of cross contamination and transfer of micro-organisms from person to person. Bathing with antimicrobial preparations the day before and the morning of surgery can reduce the number of micro-organisms on the skin. The pre-op skin preparation such as cleaning of the surgical site and avoiding hair removal when possible is believed to reduce the risk of SSI. Prophylactic antibiotics given prior to skin incision is another intervention frequently used. Aseptic techniques, preoperative surgical hand scrub, appropriate use of surgical attire, limiting traffic in the OR are actions we have historically used to reduce infection risk in all surgical settings. Last but not least, surveillance of our patients for post-operative infection and educating our patients about signs and symptoms of infection are important for the earliest response to a post-operative infection.