Healthy Wounds are Happy Wounds:

Preventing Surgical Site Infections in Small Animal Patients Hayley Pritchard, BS, AAS, LVT Auburn University College of Veterinary Medicine 1220 Wire Road Auburn, AL 36849-5540 Phone: 334-844-4690 or 334-321-7870 Fax: 334-844-6034 HAD0002@auburn.edu

Despite advances and improvements in veterinary medicine, surgical site infections remain of clinical and considerable importance. Surgical site infections have proven to impose significant demands on veterinary patients, practices, and pet owners alike. Substantial mortality and morbidity rates, consumption of resources, financial and emotional burden, legal liability and decline in overall welfare are the prices to be paid for post-operative infections. While the cause of surgical site infections is often multi-factorial, a consistent and team-based approach offers positive advancement towards minimizing risks and maximizing agreeable outcomes. At the center of that team is an educated and patient focused veterinary nurse. Veterinary nurses play a crucial role in decreasing surgical site infections, contributing to successful outcomes, and the advancement of veterinary medicine.

Keywords: Surgical site infection, prevention; asepsis, communication, surveillance, wounds

Terminology:

- <u>Abscess</u>- Localized collection of pus in part of the body, formed by tissue disintegration usually resulting from bacterial infection and surrounded by an inflamed area
- Asepsis- A condition of sterility where no living organisms are present
- <u>Clean contaminated surgery</u>- Controlled entry into hollow viscus (gastrointestinal, genitourinary, and respiratory), minor break in asepsis
- <u>Clean surgery</u>- non-traumatic, no break in aseptic technique, uninfected, integumentary and musculoskeletal soft tissues, elective, primarily closed, and no drains used
- <u>Contaminated surgery</u>- Bacteria introduced into normally sterile body cavity; infection not yet established. Major break in asepsis during surgery. An open, fresh traumatic wound, or acute penetration into bowel
- <u>Culture and susceptibility</u>- Laboratory test to determine presence of organisms (bacterial/fungal etc.) causing an infection and which antimicrobial(s) will inhibit their growth.
- <u>Deep infection</u>- Infection occurring 30-90 days post operatively (within 1 year for implants) and involving deep soft tissues of the incision
- <u>Dirty surgery</u>- Surgery performed to control established infection. Purulent discharge encountered, devitalized tissue, foreign or fecal material
- <u>Edema</u>- The accumulation of fluid in a space that is not normally fluid filled resulting from venous or lymphatic obstruction or increased vascular permeability
- <u>Hypothermia</u>- Abnormally low body temperature. The measure body temperature must be compared with what is normal for the age group because neonates have lower body temperatures than adults

- <u>Hypovolemia</u>- Decreased circulating blood volume
- <u>Hypoxemia</u>- Low tissue oxygen levels
- <u>Infection</u>- The growth of disease-producing bacteria or other microorganisms in the tissues
- <u>Inflammation</u>- A response of body tissues to injury or irritation; characterized by pain, swelling, redness, and heat
- <u>Minimum inhibitory concentration (MIC</u>)- The lowest concentration of an antimicrobial agent that will inhibit the visible growth of a microorganism after overnight incubation
- <u>Organ/Space infection</u>- Infection occurring 30-90 days post operatively (1 year for implants) involving any part of the body, excluding skin incision, fascia, or muscle layers
- <u>Seroma</u>- A serosanguinous accumulation of fluid between tissue planes
- <u>Sterile</u>- Free from any living microorganisms
- <u>Sterile field</u>- An area that has been prepared for the use of sterile equipment. It includes the areas around the wound, incision site, or body orifice into which an instrument or catheter will be passed. It also includes the area covered by sterile drapes and the sterile region of properly attired personnel
- <u>Sterile technique</u>- Creating a sterile field and working within it by not contaminating it with nonsterile objects
- <u>Superficial infection</u>- Infection occurring within 30 days of a surgical procedure involving only skin and subcutaneous tissues of the incision
- <u>Surgical Site Infection (SSI)</u>- An infection that occurs after surgery in the part of the body where the surgery took place
- <u>Surveillance</u>- Close observation, active prevention, follow up

• <u>Wound</u>- Any injury to living tissue in which the skin is cut or broken

Presentation Overview:

- Defining surgical site infections
- Prevalence and impacts of surgical site infections
- Classification of surgical procedures
- Identifying risk factors
- Minimizing and managing risk factors
- Diagnosing and treating surgical site infections
- The veterinary nurse's role

Summary:

Veterinary nurses are instrumental in achieving successful patient outcomes and thriving practices. Education and general understanding of surgical site infections are crucial to their prevention and treatment as well as to the advancement of veterinary medicine. Raising the standards of patient care throughout the perioperative and hospitalization periods, active surveillance, and appropriate treatment are key to minimizing and managing surgical site infections.

References:

 Bassert JM, McCurnin DM. McCurnins clinical textbook for veterinary technicians. 7th ed. St. Louis, MO: Elsevier Saunders; 2010.

- Beal MW, Brown DC, Shofer FS. The Effects of Perioperative Hypothermia and the Duration of Anesthesia on Postoperative Wound Infection Rate in Clean Wounds: A Retrospective Study. Veterinary Surgery. 2000; 29(2):123–7.
- Ameet Singh, Meagan Walker, Joyce Rousseau, Jeffrey Scott Weese. Characterization of the biofilm forming ability of Staphylococcus pseudintermedius from dogs [Internet]. BMC Veterinary Research. BioMed Central; 2013 [cited 2018Aug28]. Available from: https://bmcvetres.biomedcentral.com/articles/10.1186/1746-6148-9-93
- Chlorhexidine-Alcohol versus Povidone-Iodine for Surgical-Site Antisepsis. Darouiche RO, Wall MJ Jr, Itani KM, et al. N Engl J Med 2010; 362(1):18–26. The Spine Journal. 2010; 10(5):457.
- Global Guidelines for the Prevention of Surgical Site Infection [Internet]. World Health Organization. World Health Organization; 1970 [cited 2018Aug28]. Available from: http://apps.who.int/iris/handle/10665/250680
- Nelson LL. Surgical Site Infections in Small Animal Surgery. Veterinary Clinics of North America: Small Animal Practice. 2011; 41(5):1041–56.
- Occhipinti LL, Hauptman JG, Greco JJ, Mehler SJ. [Internet]. Advances in pediatrics. U.S. National Library of Medicine; 2013 [cited 2018Aug28]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3831391/
- Owens C, Stoessel K. Surgical site infections: epidemiology, microbiology and prevention. Journal of Hospital Infection. 2008; 70:3–10.
- Turk R, Singh A, Weese JS. Prospective Surgical Site Infection Surveillance in Dogs. Veterinary Surgery. 2014;

- 10. Updated Recommendations for Control of Surgical Site...: Annals of Surgery [Internet]. LWW.
 Oxford University Press; [cited 2018Aug28]. Available from:
 https://journals.lww.com/annalsofsurgery/Fulltext/2015/03000/Updated_Recommendations_for_
 Control_of_Surgical.35.aspx
- Uçkay I, Harbarth S, Peter R, Lew D, Hoffmeyer P, Pittet D. Preventing surgical site infections.
 Expert Review of Anti-infective Therapy. 2010; 8(6):657–70.
- 12. Verwilghen D, Singh A. Fighting Surgical Site Infections in Small Animals. Veterinary Clinics of North America: Small Animal Practice. 2015; 45(2):243–76.
- 13. Weese S. A review of post-operative infections in veterinary orthopaedic surgery. Veterinary and Comparative Orthopaedics and Traumatology. 2008;