Evaluation of Blood Cultures Growing Coagulase-negative Staphylococci (CoNS)

Background:

- Coagulase-negative staphylococci (CoNS) are skin commensals and are the most common contaminants of blood cultures

- It is important to distinguish between contamination and bloodstream infection (BSI) to prevent:
    - Unnecessary antibiotics leading to toxicities and resistance
    - Unnecessary tests such as echocardiograms to evaluate for a complicated source of infection
    - Under-treatment of true infections
    - Longer hospitalization
    - Increased costs

- Contamination is generally presumed if only one of at least two sets of blood cultures is positive for CoNS
    - But, patients with true BSI can sometimes have only one positive blood culture AND
    - Contamination is possible when two or more sets of blood cultures are positive

- The differentiation of a contaminant from a pathogen causing true infection is based on clinical and microbiological factors
    - A true infection should be considered in a patient with fever, leukocytosis or hypotension

- True CoNS bacteremia are most commonly associated with medical device infections such as intravascular catheter infections, prosthetic valve endocarditis, prosthetic joint infections, pacemaker infections, and CNS shunt infections

Important Note: *Staphylococcus lugdunensis* is a virulent CoNS that behaves like *Staphylococcus aureus* and should always be managed with the assistance of an ID provider

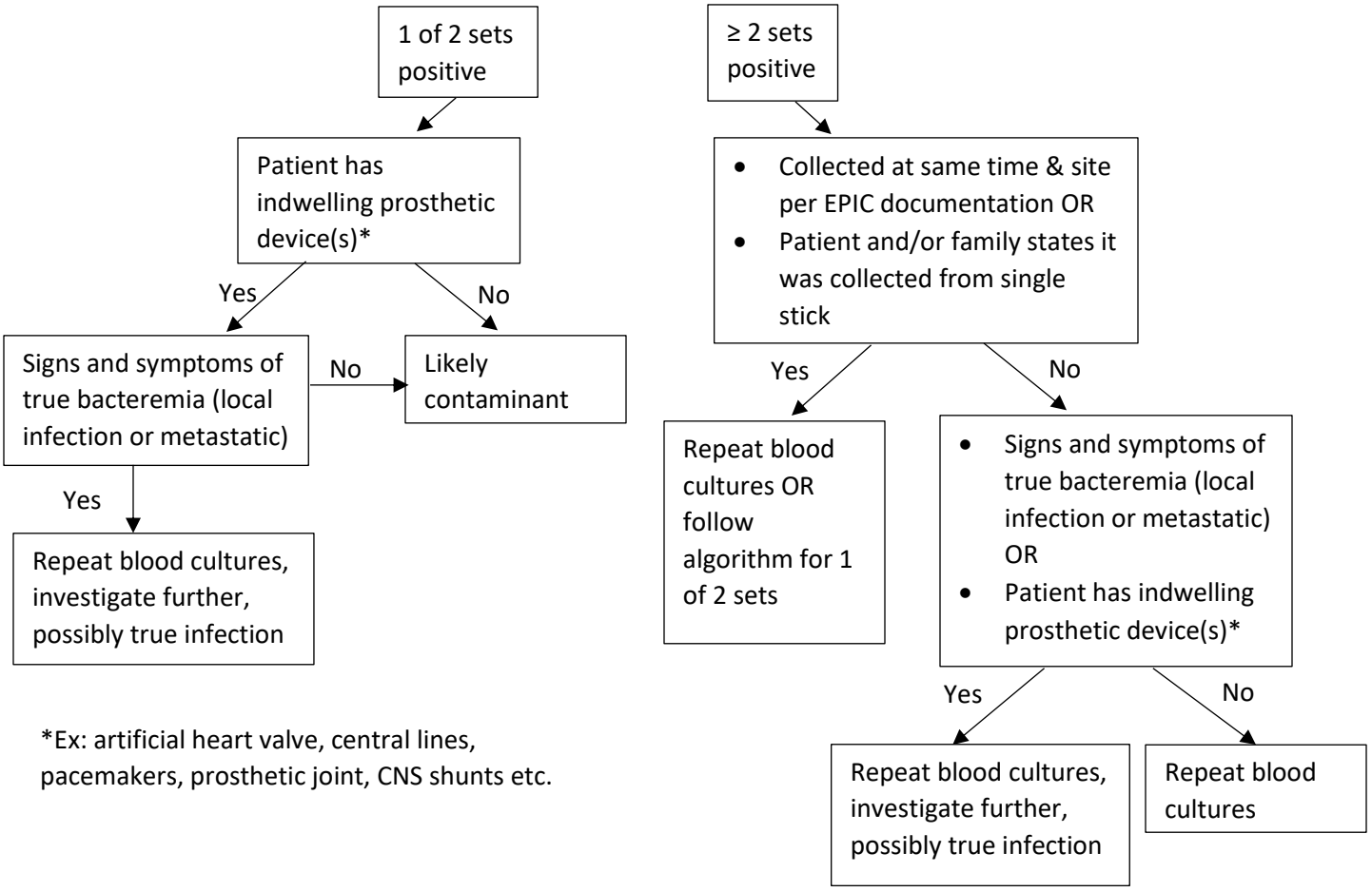
References:

Holland TL, Raad I, Boucher HW, et al. Effect of algorithm-based therapy vs usual care on clinical success and serious adverse events in patients with Staphylococcal bacteremia. JAMA 2018; 320(12): 1249-1258.

Michels R, Last K, Becker SL, et al. Update on coagulase-negative staphylococci – what the clinician should know. Microorganisms 2021;9: 830.

Elzi L, Babouee B, Vogeli N, et al. How to discriminate contamination from bloodstream infection due to coagulase-negative staphylococci: a prospective study with 654 patients. Clin Microbiol Infect 2012; 18:E355-361.

Algorithm for evaluating patients with blood cultures growing CoNS:



*Ex: artificial heart valve, central lines, pacemakers, prosthetic joint, CNS shunts etc.

Likely contamination:

- Single blood culture positive for CoNS
- No signs and symptoms of true bacteremia (local infection or metastatic)
- No indwelling prosthetic devices

Likely contamination:

- 2 sets of blood cultures positive for CoNS documented as collected from time and site OR patient and/or family states cultures were collected from single stick
- Negative follow up blood culture in the absence of active antibiotic therapy
- No signs and symptoms of true CoNS bacteremia (local infection or metastatic)
- No indwelling prosthetic devices