## Indications for Blood Cultures (BCx) in Adult Non-Neutropenic Patients

### BCx being considered for symptoms/signs of infection including fever or leukocytosis

- **Patient is clinically unstable with severe sepsis/septic shock**
  - **BCx NOT RECOMMENDED**
  - **BCx RECOMMENDED**
    - Draw 2 peripheral sets

#### Examples (high):
- IE/endovascular infection
- Catheter-associated bloodstream infection
- Discitis/native VO
- Epidural abscess
- Meningitis
- Nontraumatic native septic arthritis
- Ventriculoperitoneal shunt infections

#### Examples (intermediate):
- Acute pyelonephritis
- Cholangitis
- Non-vascular shunt infections
- Prosthetic VO
- Severe CAP (PSI V and IV)
- Shaking chills
- Cellulitis in patients with comorbidities
- VAP

#### Examples (low):
- Isolated fever without chills and/or leukocytosis
- Non-severe cellulitis
- Lower UTI (e.g., cystitis, prostatitis)
- Non-severe CAP, HCAP
- Examples (very low):
  - Post-operative fever within 48 hours of surgery

### BCx being considered to document clearance of bacteremia

- Is the follow-up BCx to document clearance of bacteremia for any of the following?
  - **S. aureus, S. lugdunensis, Enterococcus†** bacteremia
  - Candida fungemia
  - Bacteremia in a patient with suspected endovascular infection OR patient at risk for endovascular infection
  - Catheter-related bloodstream infection before catheter replacement

#### Viridans group Streptococcus:
- Careful evaluation of clinical scenario and risk factors for IE

### Decision Tree

- **BCx RECOMMENDED**
  - Draw 2 peripheral sets
  - Within 48 hours of initial BCx

- **BCx NOT RECOMMENDED**
  - Negative blood cultures within last 48 hours
  - Obtain BCx based on pretest probability of bacteremia
  - Evaluate for source control

- **Intermediate (≥10% and <50%)**
  - High (>50%)
  - Low (<10%)

- **YES**
  - Concern for persistent bacteremia (lack of source control, lack of clinical improvement, ineffective therapy)
  - Single positive BCx with skin flora in symptomatic patients including those with prosthesis or intravascular catheter

- **NO**
  - Negative blood cultures within last 48 hours
  - Concern for persistent bacteremia (lack of source control, lack of clinical improvement, ineffective therapy)
  - Single positive BCx with skin flora in symptomatic patients including those with prosthesis or intravascular catheter

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*Note: *See Appendix for details on appropriate BCx panels and definitions of high, intermediate, and low pretest probability of bacteremia.**
Algorithm of indications for bacterial blood cultures for non-neutropenic patients. The algorithm is not a substitute for clinical judgment. Peripheral BCx are preferred over central lines blood cultures due to lower false positive results. Always draw 2 peripheral sets (i.e., 4 bottles with 8-10cc/bottle).

* Blood culture (BCx) required by US Centers for Medicare and Medicaid Services severe sepsis criteria of the Severe Sepsis and Septic Shock Early Management Bundle.
† There is debate over whether a single set of BCx for Enterococcus in patients without valvular heart disease and no urinary retention/obstruction that would predispose patients to bacteremia warrant repeat BCx, but ultimately it is recommended
‡ Endovascular infection: Septic thrombophlebitis, infected endovascular thrombi, implantable cardioverter defibrillator (ICD)/pacemaker lead infections, intravascular catheter infections, and vascular graft infections.
|| Patients at risk of endovascular infection: ICD/pacemaker, vascular graft, prosthetic valves and prosthetic material used for cardiac valve repair, history of infective endocarditis, valvulopathy in heart transplant recipient, unrepaired congenital heart disease, repaired congenital heart disease with residual shunt or valvular regurgitation, or within the first 6 months post-repair.
£ Prosthesis: Orthopedic or intravascular prosthesis.
** Routine additional follow-up BCx for a single BCx with skin flora (eg, coagulase-negative staphylococci) in an immunocompetent patient are not necessary unless bacteremia is suspected or a prosthesis is present.
†† Cellulitis in patients with comorbidities: Immunocompromised hosts or those at risk of poor outcomes from sequelae from missed Staphylococcus aureus bacteremia.

Abbreviations: BCx, blood culture; CAP, community-acquired pneumonia; HCAP, healthcare-associated pneumonia; PSI, Pneumonia Severity Index; S. aureus, Staphylococcus aureus; S. lugdunensis, Staphylococcus lugdunensis; UTI, urinary tract infection; VAP, ventilator-associated pneumonia; VO, vertebral osteomyelitis.

The recommendations in this guide are meant to serve as treatment guidelines for use at Michigan Medicine facilities. If you are an individual experiencing a medical emergency, call 911 immediately. These guidelines should not replace a provider’s professional medical advice based on clinical judgment, or be used in lieu of an Infectious Diseases consultation when necessary. As a result of ongoing research, practice guidelines may from time to time change. The authors of these guidelines have made all attempts to ensure the accuracy based on current information, however, due to ongoing research, users of these guidelines are strongly encouraged to confirm the information contained within them through an independent source.

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