



## Rationale

The goal of this guideline is to provide general indications/criteria for drawing blood cultures and potentially reduce unnecessary cultures. Unnecessary cultures contribute to increased length of stay, costs and laboratory turnaround time to provide results.

## Indications for Ordering an “Initial” Blood Culture

- Blood cultures should be obtained **prior to initiation of antimicrobial therapy** for any patient in whom there is suspicion of a *bacteremia* or *fungemia*.

Use **Clinical Decision Rule** in Table 1 to help decide if blood cultures should be ordered.

**Table 1: Blood Culture Clinical Decision Rule**

<p><b>Either 1 major criterion or ≥ 2 minor criteria meet an indication for blood cultures. If these are not present, blood cultures are not indicated by the rule.</b></p>	
Major Criteria	Minor Criteria
<ul style="list-style-type: none"> <li>Temperature &gt; 103° F</li> <li>Known or suspected infection, such as:               <ul style="list-style-type: none"> <li><a href="#">Febrile neutropenia</a></li> <li>Endocarditis</li> <li><a href="#">Sepsis</a></li> <li>Septic arthritis</li> <li>Meningitis</li> <li>Osteomyelitis</li> <li>Peritonitis</li> <li><a href="#">Pneumonia</a> in ICU</li> <li>ICU patient with cellulitis, skin/soft tissue infections, necrotizing fasciitis or with comorbidities (e.g., diabetes, IV drug user)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Immunosuppression</li> <li>Indwelling vascular catheter</li> <li>Hypotension (systolic blood pressure &lt; 90 mm Hg)</li> <li>White blood cell count (WBC) &gt; 18,000 cells/mm<sup>3</sup> or WBC &lt; 4,000 cells/mm<sup>3</sup></li> <li>PMN Bands &gt; 5%</li> <li>Platelets &lt; 150,000 cells/mm<sup>3</sup></li> <li>Temperature 100.4 – 102.9°F</li> <li>Chills</li> <li>Age &gt; 65 Years</li> <li>Creatinine &gt; 2.0 mg/dL</li> </ul>

### Note:

- Do not repeat cultures if done at transferring hospital
- Do not order cultures for suspected viral infection

## Indications for Ordering “Follow-up” Blood Culture(s) after an Initial Positive Blood Culture

Conditions that would be **appropriate** for follow-up blood cultures include:

- Known or suspected endocarditis.
- [Bacteremia due to \*Staphylococcus aureus\*](#)
- Presence of fever, leukocytosis **more than 72 hours**, or unknown source following initiation of pathogen directed therapy.
- Known or suspected site of infection with limited antimicrobial penetration (i.e. abscess or joint space infection).
- Presumed source of infection in abdomen or central nervous system.
- Presence of prosthetic vascular grafts, intravascular lines, or cardiac devices (i.e. pacemaker/AICD, VAD, IABP, ECMO).
- Presence of pathogens known or suspected to be resistant to standard antibacterial agents (i.e. MDR *Pseudomonas*, *Acinetobacter*, CRE).

In general, follow-up blood cultures are **NOT** needed unless there is a new concern for infection.

## Clinical Examples

Blood cultures should only be ordered for patients when there is a clear indication. The following include examples of appropriate and inappropriate blood culture use.

### Appropriate Blood Cultures

- Order a “follow-up” blood culture for a patient with a positive blood culture for a gram-positive pathogen (especially *S. aureus*) to confirm clearance.
- Document clearance of gram negative (GN) bacteremia, in situations with multi-drug resistant pathogens (e.g. *Pseudomonas*, *Acinetobacter*, ESBL-producers, carbapenemase-producers, etc.) or any (GN) pathogen when the source of the original infection is not clear or controlled.

### Inappropriate Blood Cultures

- DO NOT** order blood cultures reflexively every time a patient has a fever without considering whether a blood culture is truly indicated. (See indications).
- DO NOT** order routine follow up blood cultures for susceptible GN enteric pathogens when the source of infection (e.g. UTI, pyelonephritis, abscess, etc.) is clearly known, adequately controlled and patient is clinically improving.
- If it is not clear whether or not the patient needs a blood culture, discuss with the attending physician.

## Resources

---

- [Standards of Practice: Blood Cultures](#)
- [All Infectious Disease Related Guidelines](#)

## References

---

- "[Blood Cultures for the Detection of Bacteremia](#)" Gary V. Doern, MD, Emeritus Professor of Pathology, University of Iowa; [www.UpToDate.com](http://www.UpToDate.com)
- Shapiro N, Wolfe R, Wright, S, et al. Who needs a blood culture? A prospectively derived and validated prediction rule. *The Journal of Emergency Medicine* 2008;35:255–264.
- Canzoneri CN, Akhavan BJ, Tosur Z, Alcedo Andrade PE, Aisenberg, GM. Followup blood cultures in Gram Negative Bacteremia: Are they Needed?. *Clinical Infectious Diseases* 2017 July 26.
- Coburn B, Morris AM, Tomlinson G, Detsky AS. Does This Adult Patient With Suspected Bacteremia Require Blood Cultures?. *JAMA*. 2012;308(5):502–511.

## Authors

---

- Eric Adkins, MD
- Preeti Pancholi, PhD, D(ABMM)
- Julie Mangino, MD
- Kurt Stevenson, MD
- Christina Liscynesky, MD
- Shandra Day, MD
- Joan-Miquel Balada-Llasat, PharmD, PhD, D(ABMM)

## Quality Measures

---

- Number of blood culture orders per patient
- Percent of patients with negative result
- Average number of cultures per patient
- Average number of cultures/patient with negative result

## Guideline Approved

---

November 29, 2017. First Edition.

**Disclaimer:** *Clinical practice guidelines and algorithms at The Ohio State University Wexner Medical Center (OSUWMC) are standards that are intended to provide general guidance to clinicians. Patient choice and clinician judgment must remain central to the selection of diagnostic tests and therapy. OSUWMC's guidelines and algorithms are reviewed periodically for consistency with new evidence; however, new developments may not be represented.*

*Copyright © 2017. The Ohio State University Wexner Medical Center. All rights reserved. No part of this document may be reproduced, displayed, modified, or distributed in any form without the express written permission of The Ohio State University Wexner Medical Center.*