

Blood Culture Vial Conservation Guidance Document for Acute Care Facilities



Purpose:

To provide high-level practical and clinical guidance to Washington State acute care facilities on blood culture vial conservation strategies

Situation and Background:

BD Life Sciences is experiencing a temporary shortage of plastic blood culture vials from their supplier¹. The CDC has issued a [HAN advisory](#) recommending that facilities develop strategies to preserve the supply for patients at highest risk². Facilities may track the most current updates regarding this shortage on [the manufacturer’s website](#). If you are experiencing a significant shortage of BD BACTEC blood culture bottles, please contact the FDA at deviceshortages@fda.hhs.gov.

Assessment:

Opportunities	Evidence
<p>Safe and Rapid Reduction of Quantity</p> 	<p>Several clinical scenarios have been identified as areas in which blood cultures are expected to have low yield and are therefore not recommended (see Table 1 on Page 2). Targeting these low-yield cultures may lead to a reduction of 40% or more, depending on local practices³. This strategy had no adverse impacts on mortality, length of stay, readmission or compliance with the CMS SEP-1 Core Measure³.</p>
<p>Optimize Collection Practices</p> 	<p>The optimal volume is 10 mL per vial for adults with volumes for pediatric patients based on either age or weight^{4,5}. Up to 80% of blood cultures are underfilled or overfilled⁵. Correcting these deficiencies with education and providing support for barriers resulted in a 20% increase in blood culture positivity in one study⁵. Up to 40% of blood cultures are single set only; however, single sets miss 10 to 40% of bloodstream infections (BSI) and blood culture contamination is difficult to detect⁵. Anaerobic and aerobic bottles are both important for isolate detection. Studies found that 16% of 1,081 episodes of BSI in adults and 18% of 741 episodes in children were detected in anaerobic bottles only⁵.</p>



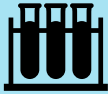

Opportunities	Evidence
<p>Antimicrobial Stewardship</p> 	<p>The implications of a blood culture vial shortage on antibiotic prescribing practices are unknown. In studies of patients with common infectious syndromes, (e.g. community acquired pneumonia, urinary tract infection, cellulitis), blood culture data did not change management because antibiotics were based on susceptibility data from the primary source of infection (e.g. urine culture) or were based on guidance for the clinical syndrome^{5,6}. However, blood cultures can inform targeted therapy in BSI in the setting of sepsis.</p>

Table 1:

Clinical Scenarios in Which Blood Cultures Are Not Recommended Due to Low-Yield^{3,6}:
<ul style="list-style-type: none"> • Isolated non-neutropenic fever without other signs or symptoms of infection • Isolated leukocytosis (i.e., without other signs or symptoms of infection) • Repeat blood cultures for ongoing fever and/or leukocytosis and negative blood cultures ≤72 hours without clinical change • Repeat blood cultures to document clearance of BSI caused by organisms other than <i>S. aureus</i>, <i>S. lugdunensis</i>, or <i>Candida</i> UNLESS there is suspected/proven endovascular infection or suspected persistent bacteremia • Repeat blood cultures to rule out blood culture contamination in immunocompetent patients without prosthetic implants • Community-acquired pneumonia not requiring intensive care unit (ICU) care • Cellulitis not requiring ICU care • Post-operative fever within 48 hours after surgery • Lower urinary tract infection (i.e., cystitis, prostatitis) • Surveillance blood cultures in patients without suspicion for bacteremia (e.g., prior to total parenteral nutrition initiation/central line placement/procedures, patients withdrawing from sedation weans, ECMO, CRRT)

Recommendations:

Opportunity	Recommendation
<p data-bbox="207 394 407 495">Safe and Rapid Reduction of Quantity</p> 	<ul style="list-style-type: none"> <li data-bbox="558 394 1463 695">• Refer to this John Hopkins Medicine guidance document to assist with creating a conservation strategy and for clinical decision-making flowcharts for adult and pediatric populations. <ul style="list-style-type: none"> <li data-bbox="651 520 1463 695">○ For critical access hospitals without an on-site laboratory: follow the above guidance document and reach out to the contract laboratory to determine impact of shortage. Create a conservation strategy based upon feedback received <li data-bbox="558 720 1458 821">• Target low-yield blood cultures (see Table 1), focusing on the departments with highest use (usually inpatient medicine, ICU, surgery, and oncology³) <li data-bbox="558 846 1463 947">• Work with the Information Technology team to review and update current order sets, protocols, and best practice alerts in the electronic health record with new conservation strategies <li data-bbox="558 972 1414 1031">• Communicate shortage and conservation strategies with all appropriate team members <li data-bbox="558 1056 1414 1157">• Work with a multidisciplinary team to identify further opportunities for blood culture conservation depending upon local practices and specialties
<p data-bbox="207 1234 472 1293">Optimize Collection Practices</p> 	<ul style="list-style-type: none"> <li data-bbox="558 1234 1414 1335">• Educate applicable team members on aseptic blood culture collection techniques to reduce risk of contamination (see Resources on Page 4) <li data-bbox="558 1360 1409 1419">• Educate applicable team members on proper blood culture vial volumes to maximize sensitivity of the culture <li data-bbox="558 1444 1446 1524">• Ensure two sets of blood cultures are collected during the onset of sepsis prior to starting antibiotic therapy
<p data-bbox="207 1581 386 1640">Antimicrobial Stewardship</p> 	<ul style="list-style-type: none"> <li data-bbox="558 1581 1382 1640">• Assess institution-wide durations of antibiotic therapy for education opportunities <li data-bbox="558 1665 1446 1808">• Provide education on guideline-concordant therapy recommendations and durations for common syndromes (i.e., cellulitis, urinary tract infection, community-acquired pneumonia)

Resources:

- [CDC HAN Advisory, July 23, 2024](#)
- [Infectious Diseases Society of America's \(IDSA\) and the American Society for Microbiology's \(ASM\) Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases](#)
- [FDA's Letter to Health Care Providers Regarding BD BACTEC Blood Culture Media Bottles](#)
- [CDC's Blood Culture Contamination Overview for Infection Control and Antibiotic Stewardship Programs](#)
- [CDC's Preventing Adult Blood Culture Contamination for Clinical Laboratory Professionals](#)
- [CDC/IDSA Clinician Call: BD BACTEC Blood Culture Bottle Shortage \(Hosted with ASM, SHEA, and PIDS\)](#)

References:

1. BD Life Sciences. [BD BACTEC Media Supply Customer Letter](#). June 2024
2. CDC. [Health Alert Network \(HAN\) - 00512 | Disruptions in Availability of Becton Dickinson \(BD\) BACTEC™ Blood Culture Bottles](#). July 23, 2024.
3. John Hopkins Medicine. Blood Culture Stewardship. July 2024. Available at https://www.int-med.uiowa.edu/Research/EIN/JHU_BCStewardship.pdf
4. Miller JM, Binnicker MJ, Campbell S, Carroll KC, Chapin KC, Gonzalez MD, Harrington A, Jerris RC, Kehl SC, Leal SM Jr, Patel R, Pritt BS, Richter SS, Robinson-Dunn B, Snyder JW, Telford S 3rd, Theel ES, Thomson RB Jr, Weinstein MP, Yao JD. Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2024 Update by the Infectious Diseases Society of America (IDSA) and the American Society for Microbiology (ASM). Clin Infect Dis. 2024 Mar 5:ciae104. doi: [10.1093/cid/ciae104](https://doi.org/10.1093/cid/ciae104). Epub ahead of print.
5. Fabre V, Carroll KC, Cosgrove SE. Blood Culture Utilization in the Hospital Setting: a Call for Diagnostic Stewardship. J Clin Microbiol. 2022 Mar 16;60(3):e0100521. doi: [10.1128/JCM.01005-21](https://doi.org/10.1128/JCM.01005-21). Epub 2021 Jul 14.
6. Fabre V, Sharara SL, Salinas AB, Carroll KC, Desai S, Cosgrove SE. Does This Patient Need Blood Cultures? A Scoping Review of Indications for Blood Cultures in Adult Nonneutropenic Inpatients. Clin Infect Dis. 2020 Aug 22;71(5):1339-1347. doi: [10.1093/cid/ciaa039](https://doi.org/10.1093/cid/ciaa039)

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This document is meant to provide general guidance and does not apply to all clinical scenarios. Always assess the individual patient, use your clinical judgment, and follow your institution's treatment guidelines and protocols when applicable