

Better Blood Cultures, Better Care

Precise Diagnostic and Specimen Stewardship



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Protecting Patients One Blood Culture at a Time

Diagnostic stewardship means ordering the right test at the right time for the right reason, making sure patients are not over- or under-tested. Specimen stewardship, a critical part of that, focuses on how we collect and handle samples to make sure the results are as accurate as possible. Together, these practices help clinicians make better, faster decisions and help patients get the right care.

Take blood cultures, for example. While common, they're crucial to patient safety. Blood cultures play a vital role in tailoring antibiotic treatment, guiding clinical care, and even impacting facility level factors such as patient throughput and hospital expenditures.¹ But to get all those benefits, you need to put precision into practice: from deciding to test, to how the specimen is drawn.

Why Every Culture Counts

Before collecting a blood culture, we need to make sure it's truly necessary and clinically indicated. Then, following the proper steps for collection, like disinfecting the tops of culture bottles and choosing the right collection site, reduces the risk of inaccurate results and potential patient harm.

“When a blood culture yields a false positive result due to contamination, the downstream impact can be serious.”

If a patient's blood culture results falsely positive due to improper specimen collection techniques, they may receive antibiotics they don't need, increasing their risk of antibiotic resistance, acute kidney injury, or *Clostridioides difficile* infection.

These factors may increase patient length of stay, adding costs for both the patient and the healthcare facility from additional laboratory tests and antimicrobial use, extended use of vascular access devices or indwelling urinary catheters, and a higher risk for healthcare-acquired conditions. Each additional night in an acute care facility increases the patient's risk of an adverse drug reaction by 0.5%, developing a healthcare-associated infection by 1.6%, and developing a pressure injury by 0.5%.^{1,2}

Setting Teams Up for Success

Facilities can reduce unnecessary testing and contamination by clearly defining appropriate indications and standardizing how specimens are collected. This includes using evidenced-based guidelines and decision-support tools to identify when blood cultures are warranted. Examples of appropriate indications include (but are not limited to):

- › Initial blood culture indications
 - » Sepsis/septic shock
 - » Catheter-associated bloodstream infection
 - » Meningitis
- › Repeat blood culture indications
 - » Determining clearance of *Staphylococcus aureus* bacteremia
 - » Bacteremia secondary to endocarditis

Appropriate clinical indication(s) for ordering initial and repeat blood cultures is complex and multifactorial, making proper clinical judgement critical. For additional considerations on appropriate clinical indications for blood cultures, review Ryder et al, **Every Crisis Is an Opportunity: Advancing Blood Culture Stewardship During a Blood Culture Bottle Shortage**.^{3, 4}

Process consistency matters, too. Healthcare facilities should ensure appropriate procedures are established for collecting and transporting blood cultures. The below considerations can help decrease blood culture contamination, therefore, increasing the accuracy of results. Appropriate procedures include considerations such as:

- › Appropriate skin antisepsis prior to collection
- › Favoring peripheral venipuncture as opposed to collecting from pre-existing vascular access devices
- › Collecting appropriate blood volumes
- › Disinfecting the blood bottle cap prior to specimen collection
- › Diverting the initial blood aliquot via device or waste tube

Reviewing all practices to decrease blood culture contamination is beyond the scope of this article. For additional considerations on appropriate processes for collecting blood cultures to minimize blood culture contamination, review guidance from the Centers for Disease Control and Prevention, **Blood Culture Contamination: An Overview for Infection Control and Antibiotic Stewardship Programs Working with the Clinical Laboratory**.^{1, 5}

A Safer, Smarter Approach to Testing

Getting blood cultures right isn't just a laboratory concern; it's a patient safety issue. Given that blood cultures are one of the most commonly used laboratory tests to detect bloodstream infections among hospitalized patients, it is crucial to focus on quality improvement initiatives to increase the accuracy of results.⁶

This is where precision in practice really matters. Fewer false positives, fewer extra tests, less unnecessary antibiotic use, and shorter hospital stays all come from improving how, and when, blood cultures are drawn.⁶ Following these practices can help provide clinicians with the foundation to be able to better care for patients and positively impact patient safety, patient outcomes, and patient experience. That's a win for everyone.

References

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