

do one thing *differently*

Targeting Antimicrobial Stewardship:
Preventing Blood Culture Contamination

Think About It

Improving antimicrobial use improves patient outcomes. Appropriate, judicious use of antibiotics is dependent on choosing the right antimicrobial at the right dose for the right duration of time. Choosing the right antimicrobial is based on the accurate identification of the causative pathogen. Blood cultures are an important laboratory test to assist practitioners with the accurate identification of pathogens.

The proper collection of a blood culture specimen is the most important step in the recovery of pathogenic organisms responsible for infectious processes. A poorly collected specimen may lead to failure in isolating, detecting and successfully treating the pathogen and may result in the recovery of and inappropriate treatment of a contaminating organism.

Did You Know?

About 25% of positive blood cultures are due to contamination, which leads to inappropriate antibiotic treatment, additional unneeded tests and extended hospital stays. Up to 40% of patients with contaminated blood cultures are started on antimicrobials, which results in increased total microbiology charges and increased patient length of stay, creating excess cost and inappropriate antimicrobial use.

Best Practices for Blood Culture Contamination Prevention:

Diagnostic Stewardship: Order blood cultures for appropriate reasons.

- Underuse – Examples include obtaining blood cultures after antimicrobial starts in suspected sepsis impacting the possibility of recovering the pathogen and optimizing antimicrobial therapy. Drawing less blood than recommended can decrease the sensitivity for recovering the pathogen.
- Overuse – Overuse can result in inappropriate antimicrobial therapy. Examples include repeating blood cultures for a patient with a low probability of bloodstream infection or in a patient with fever when an alternative diagnosis (other than bloodstream infection) is suspected.

Proper Skin Antisepsis:

- The Centers for Disease Control and Prevention (CDC) recommends cleansing the venipuncture site with an alcohol containing skin disinfectant to minimize contamination of the blood specimen with normal skin flora.

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Best Practices - continued

- While common antiseptics include rubbing alcohol, tincture of iodine, povidone-iodine and iodophors, studies suggest chlorhexidine gluconate (CHG) and tincture of iodine are superior. Product selection may need to be based on patient's allergies.
- It is important to follow the manufacturer's guidelines regarding the amount of time required for the antiseptic product to dry to achieve its full bactericidal effect and maintain the integrity of the blood specimen.
- CHG products are effective, require only 30 seconds to dry, and are not commonly associated with allergic reactions. CHG products do not need to be removed or rinsed from the skin following venipuncture.

Blood Culture Bottle Disinfection: The accidental contamination of blood culture bottles is a common problem. It is essential that the tops, into which the blood specimen is transferred, remain sterile until the transfer is completed. Disinfect the top of the blood culture vials prior to inoculation of blood with an approved disinfectant following manufacturer's instructions.

Blood Culture Collection Site: Peripheral venipuncture is preferred over central venous line collection due to associated lower rate of contamination unless catheter associated bloodstream infection (CLABSI) is highly suspected. If it is suspected, then both a peripheral and a catheter draw are indicated.

- Specimen collection from the central catheter is not recommended due to the possibility of intraluminal bacterial contamination of the device.
- Percutaneous venipuncture from two separate sites is preferred. Inguinal blood vessels (groin) should be avoided when other venipuncture sites are available.

Phlebotomy Teams: Additional education may be needed for proper technique of collecting blood cultures to decrease risk of contamination. Using a trained team can be a best practice.

Surveillance and Feedback: As with other quality improvement protocols, feedback regarding contamination rates can help to decrease blood culture contamination.

Antimicrobial stewardship programs should consider tracking and evaluating the impact of contamination rates on vancomycin use.

Specimen collection guidelines include:

- Use this pocket card to educate staff who draw blood cultures: [Blood Culture Collection Pocket Card](#)

Additional Resources

1. [Blood Culture Collection Pocket Card](#)
2. [Blood Culture Contamination: An Overview for Infection Control and Antibiotic Stewardship Programs Working with the Clinical Laboratory](#)
3. [IPs Guide to the Lab](#)