

Use of Microbiological Cultures in the Hospitalized Patient



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KEYWORDS

- Microbiological culture • Culture contamination
- Central line-associated bloodstream infection
- Catheter-associated urinary tract infection • Hospital-acquired pneumonia
- Health care-associated pneumonia • Ventilator-associated pneumonia

HOSPITAL MEDICINE CLINICS CHECKLIST

1. Confirm that infection is present before initiation of antimicrobials. A positive microbiological culture alone does not necessarily equate to a clinical infection.
2. Proper interpretation of susceptibility data, including the minimum inhibitory concentration, is crucial to choosing targeted antimicrobial therapy.
3. Proper methods of obtaining microbiological cultures will ensure the highest yield of testing.
4. Recognition of common and uncommon contaminants in microbiological cultures is helpful in deciding whether antimicrobial management is warranted.
5. Recognition of the need for adjunctive measures to manage central line-associated bloodstream infection/catheter-related bloodstream infection is important for certain organisms and clinical scenarios.
6. Superficial wound swab cultures are not recommended to guide management in diabetic foot infections.
7. Although there is a low yield to blood cultures in those with skin and soft-tissue infections, it is recommended that blood cultures be drawn before antibiotic therapy in those with signs and symptoms of systemic toxicity, as a positive blood culture will assist in proper antimicrobial management and may affect the duration of therapy.

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The authors have nothing to disclose.

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8. There are 3 categories of infectious diarrhea that need to be recognized to determine the appropriate diagnostic evaluation.
9. Appropriate use of sputum cultures is important in determining whether pneumonia is in fact present, and the duration of antibiotic therapy.

DEFINITIONS*What is the definition of a “set” of blood cultures?*

A set of blood cultures consists of one venipuncture- or catheter-accessed blood draw of 20 mL of blood, divided into 1 aerobic and 1 anaerobic blood culture bottle.¹

What is the definition of central line–associated bloodstream infection/catheter-related bloodstream infection (CLABSI/CRBSI)?

There are 3 accepted definitions of CLABSI/CRBSI, as follows²:

1. Positive culture of the same organism from a percutaneous blood sample and the catheter tip.
2. Positive culture drawn from a catheter hub at least 2 hours before the same microbial growth from a percutaneous blood sample (known as differential time to positivity or DTP).
3. A quantitative blood culture drawn from a catheter lumen with a colony count at least 3-fold greater than the colony count obtained from a percutaneous blood sample.

What is the definition of catheter-associated urinary tract infection (CA-UTI)?

Requirements to meet the definition of CA-UTI include both³:

1. Signs or symptoms compatible with urinary tract infection (UTI) with no other identified source of infection.
2. At least 10^3 CFU/mL of 1 or more bacteria in a catheterized urine sample, or in a midstream voided urine sample within 48 hours of removal of a catheter.

What is the definition of asymptomatic bacteriuria?⁴

1. For women: At least 10^5 CFU/mL of the same bacteria in 2 consecutive voided urine samples without symptoms of UTI.
2. For men: At least 10^5 CFU/mL of 1 bacteria in a single, clean-catch voided urine sample without symptoms of UTI.
3. For both men and women: At least 10^2 CFU/mL of 1 bacteria in a catheterized urine sample without symptoms of UTI.

One must bear in mind that pyuria in and of itself does not suggest infection in the absence of symptoms.⁴

What is the definition of hospital-acquired pneumonia (HAP), health care–associated Pneumonia (HCAP), and ventilator-associated pneumonia (VAP)?

Pneumonia that occurs 48 hours or more after hospital admission, which was not incubating on admission, is considered to be hospital-acquired.⁵

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