


Blood Culture Collection and Interpretation

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Blood Cultures

- Indications for blood culture collection
- Proper method for blood culture collection
- Interpreting a blood culture report
- Causes of blood culture contamination

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Standards, Guidelines & Best Practices

Clinical and Laboratory Standards Institute
M47-A Principles and Procedures for Blood
Cultures; Approved Guideline


American Society for Microbiology
Cumitech 1C

Center for Disease Control


Emergency Nurses Association
Clinical Practice Guideline:
Prevention of Blood Culture Contamination

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Indications




To rule in or rule out septicemia



Besides the culture, gram stain and sensitivities are always performed

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Sources of Septicemia




Intravascular Sources

- Colonized intravascular devices
 - Infected vascular grafts
- Direct introduction into bloodstream

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Sources of Septicemia



Extravascular

- Infected organs, cavities & fluids
 - Urinary tract infections
 - Respiratory infections
- Infected foreign devices
- Open wounds, abscessed teeth

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Collecting a blood culture sample.....



What supplies do I need?

Does this procedure require sterile technique?


How much blood is needed?

What about other labs?




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Method of Collection



Peripheral Stick or With IV Start




1. Site selection


- Appropriate location
- Adequate blood flow
- Skin can be properly cleansed

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Method of Collection



Peripheral Stick / IV Start



2. Cleanse site

- Friction scrub
- Antiseptic must dry
- No recontamination

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Method of Collection



Peripheral Stick / IV Start



3. Prepare Supplies

- Open packages
- Connect supplies
- Mark bottles with minimum
- Clean bottle tops

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Method of Collection



Peripheral Stick / IV Start



4. Obtain blood sample

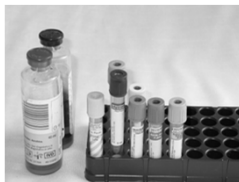
- Reapply tourniquet
- Insert needle into vein
- Fill bottles
- Label & send to lab

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Method of Collection



Peripheral Stick / IV Start



5. Blood for labs?

- Follow order of draw
- Mix additive
- Label at bedside
- Send to lab

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Method of Collection



Peripheral Stick / IV Start



6. Complete Procedure

- Remove needle or
- Connect IV tubing
- Document per facility policy

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Method of Collection



Central Venous Access Devices

1. Discontinue administration of infusates.
2. Assemble supplies.
3. Determine quantity of blood that will be needed.
4. Mark blood culture bottles.
5. Cleanse bottle tops.

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Method of Collection



Central Venous Access Devices

6. Clean needleless connector
7. Attach a 20ml syringe and withdraw blood
8. Remove syringe, attach transfer device to syringe.
9. Press transfer device into anaerobic bottle.

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Method of Collection



Central Venous Access Devices

10. Fill anaerobic bottle to optimal fill line & remove.
11. Do same with aerobic bottle.
12. Gently invert both bottles to mix.
13. Replace needleless connector per facility policy.

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Method of Collection



Central Venous Access Devices

14. Flush CVAD per facility policy.
15. Resume infusion if ordered.
16. Label blood culture bottles at patient bedside.
17. Place in Biohazard bag and route to laboratory.

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Syringe to Tube Transfer



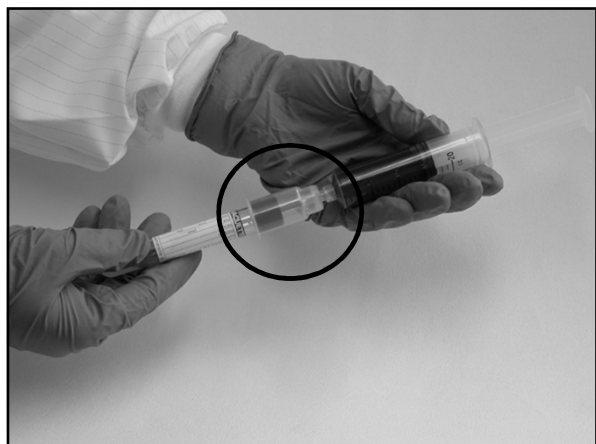
Wrong




Right



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Infection or Contamination?



- *S. aureus*;
- *viridans strep*;
- *Corynebacterium spp.*;
- *Bacillus spp.*;
- *Propionibacterium spp.*;
- *Aerococcus spp.*;
- *Micrococcus spp.*

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Why Multiple Sets?




1 set has very little predictive value

2 sets create additional confusion

3 sets provide most assurance

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Infection or Contamination?



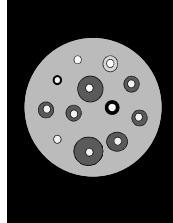
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Laboratory Report 03/07/12
 TEST: BLOOD CULTURE AND SENSITIVITY
 SOURCE: BLOOD
 SPECIMEN: L-ARM, 1 OF 3 DATE: 03/3/12
 RESULT.....FINAL 03/06/12
 GRAM STAIN: B BOTTLE GRAM POSITIVE COCCI IN CLUSTERS 03/06/12
 CULTURE RESULT: A BOTTLE NO GROWTH TO DATE
 ORGANISM 1: STAPHYLOCOCCUS AUREUS




AMPICILLIN.....	R
VANCOMYCIN.....	S
CEFAZOLIN.....	R
LEVOFLOXACIN.....	S
TETRACYCLINE.....	S
CLINDAMYCIN.....	S
ERYTHROMYCIN.....	R
GENTAMICIN.....	S
OXACILLIN.....	R
PENICILLIN G.....	R
RIFAMPIN.....	S
TRIMETHOPRIM/SULFAMETHOXAZOLE.....	S



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Blood Culture Interpretation



Indicator	Contamination	Positive
Frequency within multiple sets	Only one of multiple sets	All sets are positive
Gram stain results	Frequently a contaminate	Not usually a contaminate
Number of species	Multiple species	Singular species
Growth phase	Delayed	Immediate
Clinical symptoms	Asymptomatic	Fever, chills, WBCs elevated

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Blood Culture Interpretation



CDC Recommendations

Venipuncture sample - treat as positive infection if:

- One positive blood culture with a recognized pathogen
- Two positive cultures with same organism drawn on separate occasions and the patient is symptomatic

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Blood Culture Interpretation



CDC Recommendations

Line sample - always also do a venipuncture.
Treat as positive infection if:

- Both line draw and venipuncture are positive with the same organism and patient symptomatic.

If only the line draw is positive, it is likely a contaminate and to not treat for infection.

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Blood Culture Errors



- Taking short-cuts with cleansing
- Accidental supply contamination
- Inadequate blood in culture bottles
- Repalpating the site after cleansing

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Questions?



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