

## Obtaining Specimens for Microbiological Evaluation

IPM-2

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## Bacteremia I

- ⌘ Most bacteremias are intermittent
- ⌘ One blood culture is rarely sufficient
  - ☒ *Staphylococcus epidermidis*
  - ☒ Frequent contaminant
  - ☒ Commonest cause of PVE
- ⌘ Two blood cultures usually sufficient
  - ☒ Three or four if suspect likely contaminant
  - ☒ Antibiotic therapy

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## Blood Cultures - Volume

The magnitude of bacteremia may be low (<1cfu/ml)

Higher volumes have higher yield

| Increase Volume | Increase Yield |
|-----------------|----------------|
| 10 ml → 20 ml   | 30% → 40%      |
| 20 ml → 30 ml   | 10% → 15%      |

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## Blood Cultures - Lab Aspects

- ⌘ Additives (SPS, resins) increase yield
- ⌘ Aerobic and anaerobic bottle = one blood culture
- ⌘ Five days incubation sufficient
  - ☑ Exception: Brucella, Histoplasma, Mycobacterium, Bartonella, Legionella
- ⌘ Automated Systems detect CO<sub>2</sub>
  - ☑ Subculture detected bottles

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## Aerobic/Anaerobic Blood Culture Bottles



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## AFB Blood Culture Bottle



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## Obtaining Blood Culture

- ⌘ Locate the vein
- ⌘ Prep kit
  - ☑ Alcohol 5 sec. Dry 30-60 sec
  - ☑ Tincture of Iodine-center to periphery. Dry 45-60 sec
- ⌘ Remove caps, clean with alcohol
- ⌘ Put on gloves
- ⌘ Without palpating, draw 20 ml and put 10 in anaerobic and 10 in aerobic bottle
- ⌘ Dispose of syringe in sharps container
- ⌘ Label bottles and send to lab

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## Blood Culture Prep Kit



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## Sputum Culture Reliability

- ⌘ Expectorated unreliable because of contamination
  - ☑ Reliability ↑ if physician observes
- ⌘ Laboratory reliability screen
  - ☑ > 25 PMN's, < 10 oral squamous cells per hpf

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## Sputum Container



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## Sputum

- ⌘ Gram stain
  - ☑ Useful for immediate therapy
  - ☑ May be more reliable than culture
    - ☑ Many PMN's with single bacterial morphology
- ⌘ AFB - first morning specimen
- ⌘ *Pneumocystis carinii* - induced specimen

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## Nasal Cultures

- ⌘ Virus
  - ☑ Use wire swab
  - ☑ Place in nose 1-3 cm, rotate, 10-15 sec
  - ☑ Obtain viral transport medium from lab
- ⌘ Bacterial
  - ☑ Culturette with rigid or wire swab
  - ☑ Suspect pertussis - special media

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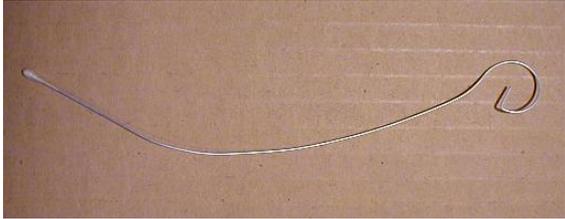
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## Wire Swab



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## Throat Cultures

- ⌘ For Group A strept, diphtheria, gonorrhea
- ⌘ Tongue blade - visualize pharynx and tonsils
- ⌘ Rub swab over tonsils and pharynx
  - ☑ INCLUDE ANY EXUDATE
- ⌘ Insert into holder, crush vial

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## Swabs for Bacterial (red) and Viral (green) Cultures



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## Cerebrospinal Fluid

- ⌘ Use sterile technique
- ⌘ First or second tube to Microbiology
- ⌘ Studies
  - ☑ Gram stain - one drop cloudy fluid or sediment
  - ☑ Aerobic culture - 1.0 ml
  - ☑ Viral culture - 1.0 ml
  - ☑ AFB or fungal culture - up to 10 ml

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## Wounds: General Principles

- ⌘ Closed space infections provide reliable specimens
- ⌘ Open wounds heavily contaminated
  - ☑ May quantitate
- ⌘ May obtain culture by aspirating advancing border
- ⌘ Culture skin, soft tissue or wound abscesses for anaerobic and aerobic organisms
  - ☑ Transport in capped syringe or special tube

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## Wound Culture

- ⌘ Closed space abscesses
  - ☑ Decontaminate skin
  - ☑ Insert needle and aspirate or aspirate pus after incision
- ⌘ Open wound
  - ☑ Remove superficial exudate
  - ☑ Aspirate through margin or swab (least reliable)
- ⌘ Transport
  - ☑ Capped syringe or anaerobic transport tube
  - ☑ Rapidly to lab

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## Urine - General

- ⌘ Collection method must avoid contamination
  - ☑ Clean catch, midstream voided
  - ☑ Catheterized urine
  - ☑ Suprapubic aspiration
- ⌘ Cultures performed quantitatively
  - ☑ Less than 10,000 per ml suggest contamination

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## Clean Catch, Midstream Urine

- ⌘ Cleanse periurethral area with soap and water
- ⌘ Pass initial urine into toilet, then collect specimen in cup
- ⌘ Instructions to patient are critical

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## Instructions for Patient

1. Remove underpants completely so they will not get soiled.
2. Sit comfortably on the seat, but do not leave your knees in front of you. Instead swing one knee to the side as far as you can.
3. Spread yourself with one hand, and continue to hold yourself spread while you clean and collect the specimen.
4. Wash—Be sure you wash well and rinse well before you collect your urine sample. Wash only the area from which you pass urine. You do not have to wash hard, but wash *slowly*. Be sure to wipe from the *front of your body towards the back*. Wash between the folds of skin as carefully as you can.
5. Do not put sponges in the toilet. Put them back in the plate.
6. Rinse—After you have washed with each soap pad, rinse with each moistened pad with the same front to back motion. Do not use any pad more than once.
7. Hold cup by the outside and pass your urine into the cup. If you touch the inside of the cup or drop it on the floor, ask the nurse to give you a new one.

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## Catheterized Urine

- ⌘ Cleanse periurethral area with soap and water
- ⌘ DO NOT RECONTAMINATE
- ⌘ Insert catheter into bladder
  - ☑ Discard initial urine
  - ☑ Collect specimen in sterile cup
- ⌘ Chronic indwelling Foley catheter
  - ☑ Clamp tubing below junction (or port)
  - ☑ Disinfect with alcohol
  - ☑ Insert needle (on syringe) through port or catheter wall and aspirate

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## Suprapubic Aspiration

- ⌘ BE CERTAIN BLADDER IS FULL - PALPATE OR PERCUSS
- ⌘ Prep skin with alcohol or iodine
- ⌘ Anesthetize with lidocaine
- ⌘ Introduce needle 2.0 cm above symphysis
- ⌘ Aspirate 20 ml for culture

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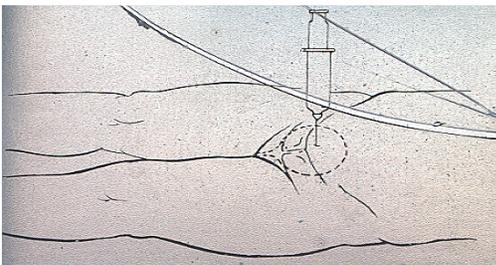
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## Suprapubic Aspiration



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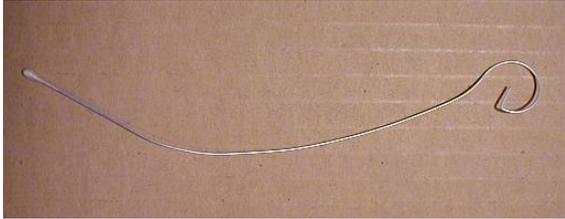
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Wire Swab



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IV Start Kit



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