



## INFECTIOUS DISEASE SPECIMEN COLLECTION

The most important step in the recovery of pathogenic organisms responsible for infectious disease is the proper collection of a specimen for culture. A poorly collected specimen may lead to failure in isolating the causative organism(s) and result in the recovery and treatment of contaminating vs. causative organisms.

For complete information on specimen preparation, transport, stability, and unacceptable conditions, consult individual test information in the [ARUP Laboratory Test Directory](#).

### Basic Collection Instructions

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### General Specimen Collection Instructions

Prior to collecting specimen, determine tests to be ordered and consult the [ARUP Laboratory Test Directory](#) for individual test specimen volume and transport requirements.

- Whenever possible, collect specimens prior to administration of antimicrobials.
- Collect the specimen at optimal times (e.g., early morning sputum for AFB culture).
- Collect the appropriate sample type and in a quantity sufficient for the test to be ordered.
- If appropriate, decontaminate the skin surface. Use 70 percent alcohol (ALC) and chlorhexidine or 1–2 percent tincture of iodine (TOI) to prepare the site. Allow a contact time of two minutes to maximize the antiseptic effect.
- Collect the specimen from the actual site of infection, avoiding contamination from adjacent tissues or secretions.
- Submit only tissue or aspirate from the infected site.

- Do not submit mechanical or medical devices from infected sites.
- Remove needle and cap collection syringe before sending.
- Properly label the specimen with at least two patient identifiers.
- Slides submitted for stains must be individually labeled on the side inoculated.
- The specimen **source is required** and must be included with the test order.
- Avoid sending mixed cultures for identification and/or susceptibility.
- Package each specimen separately in a sealed transport bag.
- Minimize transport time.
- Ensure the appropriate environment will be maintained between collection of specimens and delivery to the laboratory.

Information on transport media for other test types can be found on the [ARUP Laboratory Test Directory](#).

## Abscess

### Collection Procedure

1. Decontaminate the surface with 70 percent alcohol (ALC) and 1–2 percent tincture of iodine (TOI).
2. Collect purulent material aseptically from an undrained abscess using a sterile needle and syringe.
3. Open miliary abscesses with a sterile scalpel and collect the expressed material with a sterile needle and syringe.
4. Expel air from the syringe, remove the needle, and transfer 5–10 mL of the aspirated material to an anaerobic transport vial.
5. Transport immediately.

**Note:** Swabs are a poor collection method for abscess specimens, as they dry out easily and collect only a limited amount of material. However, if swabs must be used, carefully open a surface lesion and vigorously sample the advancing edge of the lesion.

Swabs are not acceptable for mycobacterial cultures. Swabs are acceptable for fungal cultures but are sub-optimal for recovery of fungi.

## Blood

### Collection Procedure

1. Gather the collection blood bottles or tubes needed.
2. Swab the tops of each blood culture bottle and/or the stopper of an SPS tube with alcohol. Do not allow alcohol to pool, as it could enter the system and kill organisms. Allow to dry while preparing the patient.
3. Cleanse the skin with 70–95 percent ALC.
4. Cleanse the skin with 1–2 percent TOI. Move in an ever-increasing circular pattern, starting at the point of projected needle insertion.
5. Apply a tourniquet proximal to the point of venous entry. The venipuncture site should not be palpated following disinfection.
6. Use a sterile needle and syringe or closed system blood-collection tubing.
7. Collect blood.
8. Inoculate the blood culture bottles or tubes to the fill lines without changing needles. (Refer to table below for appropriate transport medium.)
9. Invert tubes several times after specimen collection.
10. Always note the volume of blood inoculated into each bottle on the requisition.
11. Remove the iodine from the skin after collection of the specimen.
12. Label and transport specimens immediately.
13. Do not refrigerate; hold at room temperature.

Culture Type	Blood Culture Medium
Adult bacterial culture	Aerobic bottle* Anaerobic bottle
Pediatric bacterial culture	Pediatric bottle; see table below for volumes
AFB/fungal culture	BACTEC MYCO/F Lytic bottle
<i>Brucella, Francisella, Legionella</i>	SPS Vacutainer

\* If less than 10 mL is collected for two bottles, inoculate the aerobic bottle with 5 mL and inoculate the anaerobic bottle with the remainder.

#### PEDIATRIC VOLUME COLLECTION GUIDE

Patient Weight		Volume (put in one bottle if <5mL)	Total for Two Cultures	Volume of Blood Equal to 1% of Patient's Total Blood Volume (ml)
LBS	KGS			
<19	<9	1 mL	2 mL	2 mL
19–30	9–14	3 mL	6 mL	6–10 mL
31–60	15–27	5 mL	10 mL	10–20 mL
61–90	28–41	10 mL	20 mL	20–30 mL
>90	>42	20 mL	40 mL	>30 mL

#### Cutaneous (Fungus Only)

Specimen	Collection Procedure
Hair	<p><b>Note: Cut hair is not an acceptable specimen.</b> Scrape the scalp with a blunt scalpel to collect the following:</p> <ul style="list-style-type: none"> <li>• Hair stubs</li> <li>• Contents of plugged follicles</li> <li>• Skin scales</li> </ul> <p>Pluck hair from scalp with forceps.</p>
Nails	<p>Cleanse the nail with 70% alcohol; remove the outermost layer by scraping with a scalpel.</p> <p>The following specimens are also acceptable:</p> <ul style="list-style-type: none"> <li>• Clippings from any discolored or brittle parts of nail</li> <li>• Deeper scrapings and debris under the edges of the nail</li> </ul>
Skin	Cleanse the skin with 70% alcohol. Collect epidermal scales with a scalpel at the active border of the lesion.

#### Nasopharyngeal Aspirates/Washings

Specimen	Collection Procedure
Aspirate	<ul style="list-style-type: none"> <li>• Attach mucus trap to suction pump and catheter, leaving wrapper on suction catheter. Turn on suction and adjust to suggested pressure.</li> <li>• Without applying suction, insert catheter into the nose, directed posteriorly and toward the opening of the external ear. Depth of insertion necessary to reach posterior pharynx is equivalent to distance between anterior nares and external opening of the ear.</li> <li>• Apply suction. Using a rotating movement, slowly withdraw the catheter.</li> </ul>

Specimen	Collection Procedure
Washings	<ul style="list-style-type: none"> <li>• Suction 3–5 mL of sterile saline into a new sterile bulb.</li> <li>• Insert bulb into one nostril until nostril is occluded.</li> <li>• Instill saline into one nostril with one squeeze of the bulb and immediately release bulb to collect recoverable nasal specimen.</li> <li>• Empty bulb into suitable dry, sterile specimen container.</li> </ul>

## Nasopharyngeal Swab

### Collection Procedure

1. Seat the patient comfortably and tilt the head back.
2. Insert a nasal speculum, if available.
3. Insert a nasopharyngeal swab through the nares until resistance is met due to contact with the nasopharynx.
4. Rotate the swab gently and maintain contact with the nasopharynx for 20–30 seconds or until coughing is induced.
5. Transport media must be used because the swab tip is small and vulnerable to drying. The organisms likely to be present are fastidious.

## Sputum

### Collection Procedure

- Collect under direct supervision of nurse or physician.
- Instruct the patient as follows:
  - Rinse mouth with tap water to remove food particles and debris.
  - Have patient breathe deeply and cough several times to receive deep specimen.
  - Patient should expectorate into dry, sterile container.
- If patient is unable to produce sputum, induce using saline nebulization. Consult respiratory therapy for assistance.
- For AFB cultures, three sputum specimens at 8–24 hour intervals (24 hours when possible) and at least one first-morning specimen are recommended.

**Note:** An individual order must be submitted for each specimen.

## Skin

Refer to [Abscess](#), and [Wounds, Bullae and Vesicles](#).

## Stool, Feces

### Collection Procedure

- Collect specimen in a clean bed pan or use a stool collection container or plastic wrap placed between the toilet seat and the bowl.
- Do not submit feces contaminated with urine or toilet water.
- Immediately transfer specimen into the appropriate preservative per the [Fecal Preservation, Collection, and Transportation Chart](#).

**Note:** Only loose or diarrheal stools are recommended for routine bacterial and *C. difficile* cultures, as well as for molecular, electrolytes and osmolality fecal testing.

If a stool specimen is not available, the following are alternatives for culture:

- A swab of rectal mucus
- A rectal swab inserted one inch into the anal canal (not acceptable for rotavirus/adenovirus EIA)

Additional information on timed stool collections may be found at [www.aruplab.com/timed-stool](http://www.aruplab.com/timed-stool).

## Throat

### Collection Procedure

1. Use a cotton or Dacron swab.
2. Use a tongue blade and an adequate light source to ensure proper visualization.
3. Reach behind the uvula and swab:
  - Both tonsillar fauces
  - Posterior pharynx
  - Any ulceration, exudate, lesion, or area of inflammation

## Urine

Specimen	Collection Procedure
Midstream urine	<ol style="list-style-type: none"><li>1. Instructions for female patients:<ul style="list-style-type: none"><li>• Remove undergarments.</li><li>• Wash hands thoroughly with soap and water, rinse them, and dry them on a disposable paper towel or shake off excess water.</li><li>• Spread labia with one hand and keep it continuously apart.</li><li>• Take the open sterile cup in the other hand without touching the rim or inner surface of the cup or lid.</li><li>• Void 20–25 mL into the toilet and catch a portion of the rest of the urine in the container without stopping the stream; do not touch the legs, vulva, or clothing with the cup.</li><li>• Place the lid on the cup.</li></ul></li><li>2. Instructions for male patients:<ul style="list-style-type: none"><li>• Wash hands.</li><li>• Retract the foreskin completely, as necessary.</li><li>• Void 20–25 mL into the toilet and catch a portion of the remaining urine in the cup without stopping the stream. Do not touch the cup with the penis.</li><li>• Place the lid on the cup.</li></ul></li></ol>
First-void urine	<ol style="list-style-type: none"><li>1. Patient must not have urinated during the previous two hours.</li><li>2. Collect the first 10–50 mL of the urine stream in a clean, empty plastic cup.</li><li>3. Place the lid on the cup.</li></ol>
Suprapubic aspiration	Specimen collection is performed by a trained clinician using standard medical practice.
Indwelling catheter urine	<p>Do not collect urine from the drainage bag because growth of bacteria outside the catheter may have occurred at this site.</p> <ol style="list-style-type: none"><li>1. Clean the catheter with an alcohol pad.</li><li>2. Use a sterile needle and syringe to puncture the tubing. Aspirate the urine directly from the tubing.</li></ol> <p><b>Note:</b> Urine catheter tip cultures are not acceptable.</p>

## Wounds, Bullae, and Vesicles

Specimen	Collection Procedure
Closed wounds	<ol style="list-style-type: none"><li>1. Cleanse the skin as for blood cultures.</li><li>2. Aspirate the fluid/purulent material using a sterile needle and syringe and transfer to anaerobic transport media.</li><li>3. If no material is obtained, unroof the wound, vesicle, or bullous lesion and collect tissue from the base of the lesion to avoid collecting normal flora organisms.</li></ol>
Open wounds	<ol style="list-style-type: none"><li>1. Clean the sinus tract opening of the wound surface mechanically, using sterile saline or 70% alcohol to remove as much of the superficial flora as possible.</li><li>2. Attempt to culture the base or edges of the wound</li><li>3. The following are preferred specimens for sinus tracts:<ul style="list-style-type: none"><li>• Aspiration material obtained by needle or catheterization.</li><li>• Curettings from the lining of the sinus tract.</li><li>• Specimen swabbings of sinus tracts are acceptable only if the specimens listed above cannot be obtained; swabs of sinus tracts may not accurately reflect underlying disease process.</li><li>• Do not submit specimens of superficial lesions for anaerobic culture. Biopsy of advancing margin of wound is the preferred specimen for anaerobes, mycobacteria, and fungi.</li></ul></li></ol>