ARUP LABORATORIES

A nonprofit enterprise of the University of Utah and its Department of Pathology

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INFECTIOUS DISEASE SPECIMEN COLLECTION INSTRUCTIONS

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**.

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GENERAL SPECIMEN COLLECTION INSTRUCTIONS

- Determine what tests to order before collecting a specimen. Consult the **ARUP Laboratory Test Directory** for individual test specimen volume and transport requirements.
- For STD sample collection, refer to ***Sample Collection for the Diagnosis of STD Using Nucleic Acid Amplification Tests***.
- Whenever possible, collect specimens before the 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% alcohol (ALC) and chlorhexidine or 1–2% tincture of iodine (TOI) to prepare the site. Allow a contact time of 2 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

1. Decontaminate the surface with 70% ALC and 1–2% 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 suboptimal for recovery of fungi.

BLOOD

1. Gather the necessary collection blood bottles or tubes.
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% ALC.
4. Cleanse the skin with 1–2% 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 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
AFB/fungal culture	BACTEC MYCO/F Lytic bottle

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

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Guidelines: Obtaining a Blood Culture

Table. Recommended Blood Volumes for All Patients

Patient Weight	# of Venipuncture Sites and Recommended Blood Sample Volume per Site	Culture Site #1 Draw, inoculate, and label bottles before moving to Site #2	Culture Site #2	Total Bottles To Be Sent to Lab
Below 1 kg (2.2 lbs)	1 site 2 ml	 1 Pediatric Bottle: 1-3 ml (minimum 0.5ml)	N/A	 1 Pediatric bottle
1-2 kg (2.2-5 lbs)	2 sites 2 ml per site	 1 Pediatric Bottle: 1-3 ml (minimum 0.5ml)	 1 Pediatric Bottle: 1-3 ml (minimum 0.5ml)	 2 Pediatric bottles
2.01-12.7 kg (5.01-28 lbs)	2 sites 3 ml per site	 1 Pediatric Bottle: 1-3 ml (minimum 0.5ml)	 1 Pediatric Bottle: 1-3 ml (minimum 0.5ml)	 2 Pediatric bottles
12.71-36.3 kg (28.01-80 lbs)	2 sites 10 ml per site	 1 Aerobic bottle: 8-10 ml	 1 Aerobic bottle: 8-10 ml	 2 Aerobic bottles
Above 36.3 kg (80 lbs)	2 sites 17 ml per site	 1 Aerobic bottle: 8-10 ml 1 Anaerobic bottle: 5-7 ml (minimum 3 ml) Completely fill Aerobic bottle first	 1 Aerobic bottle: 8-10 ml 1 Anaerobic bottle: 5-7 ml (minimum 3 ml) Completely fill Aerobic bottle first	 2 Aerobic bottles and 2 Anaerobic bottles

Note: Fungal/AFB cultures are obtained in a BACTEC MYCO/F Lytic bottle

Table reference:

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Miller JM, Binnicker MJ, Campbell S, et al. Guide to utilization of the microbiology laboratory for diagnosis of infectious diseases: 2024 update by the Infectious Diseases Society of America (IDSA) and the American Society for Microbiology (ASM). *Clin Infect Dis*. 2024;ciae104.

Collection requirements were approved by representatives from ARUP Laboratories (Phlebotomy, Infectious Diseases) and University Hospital (Infection Prevention and Control, Infectious Diseases, Antimicrobial Stewardship) on June 10, 2024.

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Cutaneous (Fungus Only)

Hair

1. Scrape the scalp with a blunt scalpel to collect the following:
   - Hair stubs
   - Contents of plugged follicles
   - Skin scales
2. Pluck hair from scalp with forceps.

Note: Cut hair is not an acceptable specimen.

Nails

1. Cleanse the nail with 70% ALC.
2. Remove the outermost layer by scraping with a scalpel.

The following specimens are also acceptable:

- Clippings from any discolored or brittle parts of nail
- Deeper scrapings and debris under the edges of the nail

Skin

1. Cleanse the skin with 70% ALC.
2. Collect epidermal scales with a scalpel at the active border of the lesion.

NASOPHARYNGEAL ASPIRATES/WASHINGS

Aspirate

1. Attach mucus trap to suction pump and catheter, leaving wrapper on suction catheter. Turn on suction and adjust to suggested pressure.
2. 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.
3. Apply suction. Using a rotating movement, slowly withdraw the catheter.

Washings

1. Suction 3–5 mL of sterile saline into a new sterile bulb.
2. Insert bulb into one nostril until nostril is occluded.
3. Instill saline into one nostril with one squeeze of the bulb and immediately release bulb to collect recoverable nasal specimen.
4. Empty bulb into suitable dry, sterile specimen container.

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	Nasopharyngeal (NP)	Oropharyngeal (OP)	Mid-Turbinate (MT)	Nasal/Anterior Nares (NS)
Tools/Equipment	Flocked, synthetic fiber mini-tip swabs with plastic or wire shafts	Synthetic swabs with plastic shafts only	Flocked tapered swab	Flocked, synthetic fiber or foam swab with plastic shaft
How to Collect	1. Tilt patient's head back 70°. 2. Insert flexible shaft mini-tip swab through nares parallel to palate (not upwards) until: a. Resistance is met, OR b. Distance is equivalent to the distance from the patient's ear to their nostril. 3. Gently rub and roll swab. 4. Leave swab in place for several seconds to absorb secretions. 5. Slowly remove swab while rotating it. 6. Immediately place swab in sterile tubes containing transport media.	1. Insert swab in posterior pharynx and tonsillar areas. 2. Rub swab over posterior pharynx and bilateral tonsillar pillars; avoid tongue, teeth, and gums. 3. Immediately place swab in sterile tubes containing transport media. If collected with NP, combine in single tube; limit use of testing resources.	1. Tilt patient's head back 70°. 2. While gently rotating swab, insert swab about 2.5 cm (≥1 in.) straight back (not up) into nostril until the collar/safety stopping point touches the outside of the nose. 3. Rotate swab several times against wall. 4. Leave swab in place for several seconds to absorb secretions. 5. Repeat for both nostrils using same swab. 6. Immediately place in sterile tube containing transport media.	1. Insert swab about 1 cm (0.5 in) inside nares. 2. Rotate swab and leave in place for 10–15 seconds. 3. Using same swab, repeat for other nostril. 4. Immediately place in sterile tube containing transport media.

Source: Centers for Disease Control and Prevention. Guidelines for Clinical Specimens. Accessed Apr 2020.

Caution: Do NOT use calcium alginate swabs or swabs with wooden shafts, which may contain substances that interfere with nucleic acid amplification. Rayon swabs may not be compatible with all molecular platforms. Clinical laboratories should confirm compatibility of collection devices during assay validation.

Pediatrics: Swab insertion distance will differ for pediatric patients. Swabs with stoppers make estimating distance easier for MT self-collection. Two-sided MT sampling not always performed.

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PINWORM PADDLE SPECIMEN COLLECTION

1. The ideal time for this procedure is early in the morning before emptying the bowels, urinating, or bathing.
2. Label tube with appropriate patient identifiers.
3. Hold the paddle by the cap and remove it from the tube.
4. Separate the buttocks and press the tacky surface against several areas of the perianal region.
5. Place the paddle back in the tube for transport to the laboratory.
6. Seal the container in the zip-locked section of the transport bag with the lab requisition in the pouch section of the bag.

SPUTUM

- Collect under direct supervision of a nurse or physician.
- Instruct the patient as follows:

1. Rinse mouth with tap water to remove food particles and debris.
2. Breathe deeply and cough several times to receive deep specimen.
3. Expectorate into dry, sterile container.
4. If unable to produce sputum, induce using saline nebulization. Consult respiratory therapy for assistance.
5. 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 SCRAPINGS

Collect under direct supervision of a nurse or physician.

1. Identify the end of burrows beneath the skin that might suggest active mites.
2. Place a drop of mineral oil on the sample area.
3. Using a sterile scalpel, lightly scrape the area.
4. Transfer the skin scrapings to a small collection container.
5. Clean sample area using an alcohol wipe.
6. Add 2–3 mL of 70–80% ethanol to the collection container.

For collection instructions for other skin sources, refer to **Abscess**, and **Wounds, Bullae, and Vesicles.**

STOOL, FECES

1. Collect specimen in either a clean bedpan, a stool collection container, or plastic wrap placed between the toilet seat and the bowl.
2. Do not submit feces contaminated with urine or toilet water.
3. 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 in the **Timed Stool-Collection Instructions**.

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THROAT

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, and any ulceration, exudate, lesion, or area of inflammation

URINE

First-void urine

1. Patient must not have urinated during the previous 2 hours.
2. Collect the first 10–50 mL of the urine stream in a clean, empty plastic cup.
3. Place the lid on the cup.

Suprapubic aspiration

Specimen collection is performed by a trained clinician using standard medical practice.

Indwelling catheter urine

Do not collect urine from the drainage bag because growth of bacteria outside the catheter may have occurred at this site.

1. Clean the catheter with an alcohol pad.
2. Use a sterile needle and syringe to puncture the tubing.
3. Aspirate the urine directly from the tubing.

Note: Urine catheter tip cultures are not acceptable.

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Urine (continued from previous page)

Clean Catch "Midstream" Urine

Instructions for **female** patients:

1. Wash hands thoroughly with soap and water, rinse, and dry.
2. Remove the lid of the sterile container and place the lid upside-down on a clean surface.
3. Remove undergarments.
4. Remove the towelettes from the package.
5. While sitting on the toilet with legs spread apart, spread the skin around the urinary opening. With one stroke from front to back, wash the skin of the urinary opening using the towelettes.
6. Grasp the cup so that the fingers do not touch the inside or rim of the container.
7. Begin to urinate into the toilet.
8. Void a small amount into the toilet. Then, without stopping the flow of urine, bring the specimen container into the stream to fill the cup about halfway full. Do not touch the legs, vulva, or clothing with the cup.
9. Place the cup onto a clean surface and place the lid on top of it.
10. Complete urination into the toilet. Tighten the lid on the cup. Wash hands thoroughly with soap and water, rinse, and dry.

Instructions for male patients:

1. Wash hands thoroughly with soap and water, rinse, and dry.
2. Remove the lid of the sterile container and place the lid upside-down on a clean surface.
3. Remove undergarments.
4. Remove the towelettes from the package.
5. If not circumcised, the foreskin on the penis must be pulled back completely during the collection process. If circumcised, skip to the next step.
6. Grasp the penis near the end with one hand.
7. With the other hand, wash the area around the urinary opening with the towelette, using a circular motion beginning at the center of the opening.
8. Grasp the cup so that the fingers do not touch the inside or rim of the container.
9. Begin to urinate into the toilet.
10. Void a small amount into the toilet. Then, without stopping the flow of urine, bring the specimen container into the stream to fill the cup about halfway full. Do not touch the legs, penis, or clothing with the cup.
11. Place the cup onto a clean surface and place the lid on top of it.
12. Complete urination into the toilet. Tighten the lid on the cup. Wash hands thoroughly with soap and water, rinse, and dry.

WOUNDS, BULLAE, AND VESICLES

Open wounds

1. Clean the sinus tract opening of the wound surface mechanically, using sterile saline or 70% ALC to remove as much of the superficial flora as possible.
2. Attempt to culture the base or edges of the wound.

The following are preferred specimens for sinus tracts:

- Aspiration material obtained by needle or catheterization
- Curettings from the lining of the sinus tract

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.

Do not submit specimens of superficial lesions for anaerobic culture. Biopsy of the advancing margin of the wound is the preferred specimen for anaerobes, mycobacteria, and fungi.

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Closed wounds

1. Cleanse the skin as for blood cultures.
2. Aspirate the fluid/purulent material using a sterile needle and syringe and transfer to anaerobic transport media.
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.

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