Specimen Collection

To provide the most accurate test results, we rely on our clients to supply the lab with the best possible representative specimens. To ensure quality specimens, please adhere to the guidelines in this section.

The Clinical Laboratory Improvement Amendment of 1988 and our regulatory agencies require a physician’s order or an order from another authorized source before laboratory testing can be performed. A completed Martha Jefferson Hospital Laboratory or physician office requisition form provides this order. Perform specimen collections with the Martha Jefferson Hospital Laboratory supplies provided. To request routine supplies, send Supply Order Form via courier with routine pick-up or fax to our supply center at (434) 654-7164. A copy of the Supply Order Form is located in the Laboratory Forms chapter of this guide. Should specialty containers, tubes or other supplies be required or if you have questions about specimen collection or related supplies, contact Client Services at (434) 654-7170.

Martha Jefferson Hospital Laboratory requires that OSHA standards be followed to insure the safety of your staff and ours, and requires each individual patient specimen be placed in a biohazard bag for transport. Packaged this way, a broken or leaking specimen does not contaminate others. Contaminated specimens may not be used. Martha Jefferson Hospital Laboratory will contact you if it is necessary for a contaminated specimen to be recollected.

Universal Precautions

Observe universal precautions for handling of biohazardous materials when collecting specimens. Wear gloves when handling any body fluid.

Specimen Identification

Martha Jefferson Hospital Laboratory is proud of our commitment to quality laboratory service. Together, with our clients, we work hard to maintain the highest level of patient safety. To ensure accurate processing and testing, a laboratory requisition form must accompany each specimen.

Martha Jefferson Hospital Laboratory specimen identification requires two unique identifiers for each specimen received at the laboratory. These identifiers must be present on the container holding the specimen.

Label Requirements

We require that all specimens submitted be labeled with two key patient identifiers. The recommended and preferred identifiers are patient first and last name and date of birth (DOB). Alternate unique numbers can include the patient's medical record number (MR), social security number (SSN), financial number (FIN) number, accession number or unique requisition label number.

Name: Patient's full first and last, no initials

Date: Specimen collected

Time: Time of collection; required on specimen if multiple specimens to be submitted or time dependent specimen.

Source/Location: Specimen source and site when pertinent. Location descriptors required if multiple specimens from same source collected (i.e., right breast, left breast, etc.).

Label Placement: Actual specimen container must be labeled, not the container lid, or the culturette wrapper or the plastic transport bag. Glass slides (smears) must be individually be labeled.
NOTE: When providing specimen containers to patients, please label or caution patients to label container(s) before submitting specimen to the MJH Laboratory.

**Unacceptable Specimens:** Specimens submitted without two identifiers will be rejected.

Unlabeled Specimens: Unlabeled specimens received in the laboratory will be discarded and the office requested to recollect the specimen.

Label/Requisition Discrepancy: The office will be notified when a patient identification discrepancy exists between the specimen label and the requisition. If the discrepancy cannot be resolved to adequately assure proper patient identification, the specimen will be discarded and the office requested to recollect the specimen.

Leakage/Breakage: Any specimen which has broken or sustained significant leakage in transport will be discarded and the office requested to recollect the specimen.

Improper Collection: Specimen quality is imperative to obtaining good results, directly impacting interpretation and patient care. Any improperly collected specimen, or when results indicate probable collection problems, a new specimen will be requested before reporting results.

Unsterile Container: Any specimen for culture (except stool samples) submitted in an unsterile container is unacceptable.

Absorbed specimens: Specimens submitted in diapers or other absorbent material can not be efficiently processed and are unacceptable. Disposable diapers may be turned inside/out to facilitate infant sample collection without compromising the specimen. Transfer to a leakproof container.

Anticoagulation problems: Any anticoagulated specimen which is clotted or has an inadequate anticoagulant to blood ratio is unacceptable. (re: Hematology and Coagulation specimens).

**Other Specimen Conditions:**

QNS: If the quantity of specimen is insufficient for the tests requested, the lab will retain the original specimen and request additional specimen. If additional specimen cannot be provided, the laboratory will notify ordering physician and request priority of testing direction.

Hemolyzed: Severely hemolyzed specimens will need to be recollected; specimens with slight or moderate hemolysis will be processed and degree of hemolysis noted on report.

Lipemia: Severely lipemic specimens will be pretreated to eliminate interference; presence of slight or moderate lipemia will be noted on the report.

Specimen Age: If the age of the specimen and/or the preservation of the specimen prohibit the reporting of clinically sound results, the office will be requested to recollect the specimen.

In addition, samples poured into transfer tubes must include specimen type indicated on the transfer tube. Source information is also required on tubes or containers for anatomical pathology and microbiology specimens.

Exception:
Specimens "one time only" in nature, i.e. tissue/specimen derived from any invasive procedure or a body fluid, i.e. CSF, amniotic, synovial, pleural fluid, etc. should NOT be rejected or discarded. The person
responsible for specimen collection will be notified and request made that he/she labels the specimen after receipt in the laboratory. A note will be appended to the patient's record: "Specimen received unlabeled. Responsibility for specimen identification assumed by  (first and last name)." Along with the date, time and receivers initials.
Specimen Collection

**Blood Collection Guidelines:**

1. Since prolonged stasis may result in alteration of some chemical values, a tourniquet should be used for a minimum period of time.
2. Blood should not be taken while intravenous solutions are being administered or in the same syringe used to inject these solutions.
3. Blood samples should be put into the tube appropriate for the test requested. *ALL TUBES SHOULD BE INVERTED SEVERAL TIMES IMMEDIATELY AFTER BEING DRAWN.*
4. If a patient has received radioisotope material just prior to blood drawn for any radioassay, the test results may not be valid.
5. Gross lipemia can interfere with some assays. Therefore, it may be advisable to delay blood collection directly following a heavy meal.

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**Proper amount of blood for the different blue top tubes for coagulation**

(All three tubes contain 3.8% sodium citrate)

- **Fill line**: least amount and still acceptable
- **Unacceptable**: if you try to put more blood than the fill line in these two tubes, the top will not go onto the tube

- **4.5 ml blue top**: 4.5 ml blood drawn into tube 0.5 ml anticoagulant
- **"little" 2.7 ml blue top**: 2.7 ml blood drawn into tube 0.3 ml anticoagulant
- **"pedi/geri" 1.8 ml blue top**: 1.8 ml blood drawn into tube 0.2 ml anticoagulant
TUBE ORDER OF DRAW

BLOOD CULTURES (BLU THEN LAV)
NON-ADDITIVE TUBE
LIGHT BLUE (NA CITRATE)
SST (SERUM SEPARATOR / TIGER)
GOLD SST
PLAIN RED (PLASTIC)
DARK GREEN (HEPARIN)
LIGHT GREEN (LI HEPARIN)
LAVENDER (EDTA)
PINK (EDTA BLOOD BANK)
GREY (OXALATE FLOURIDE)
**Instructions for Collecting a Midstream Clean Catch Urine Specimen**

Utilize a urine collection kit, sterile cup or other sterile collection system for midstream specimens. Provide clear instructions to the patient on proper collection.

1. Open collection kit and remove cup and towelettes.

2. Unscrew cap of urine specimen cup. To avoid contamination, *DO NOT TOUCH INSIDE* of cup or cap.

3. Cleanse with towelettes as follows:

   **MALE:** Wipe head of penis in a single motion with first towelette. Repeat with second towelette. If not circumcised, hold foreskin back before cleansing.

   **FEMALE:** Separate the labia. Wipe inner labial folds front to back in a single motion with first towelette. Wipe down through center of labial folds with second towelette. Keep the labia separated while voiding.

4. Urinate a small amount into toilet or bedpan.

5. Place cup under stream and continue to urinate into cup and collect specimen.

6. Finish voiding into toilet or bedpan.

7. Replace cap on cup. Tighten cap securely. Label specimen container.

8. Specimens should be clearly labeled with the following information:

   a. Patient's name
   b. Doctor's name
   c. Date of collection
   d. Time of collection

The laboratory will reject any specimen that is not labeled correctly.
Instructions for Collecting a 24-Hour Urine Specimen

Before collecting your 24-hour urine sample, please read these instructions carefully!

For proper evaluation of test results on a 24-hour urine sample, it is important that a complete and accurate collection be made.

1. Empty your bladder when you get up in the morning at _________A.M. (time), _________(date) and DISCARD this urine.

2. From then on, collect all urine you pass during the day and night in the container provided by the doctor's office or MJH Laboratory.

3. Make you final collection when you empty your bladder the next morning at the same hour _________A.M. (time), _________(date).

4. Keep the collected urine refrigerated and return it to the doctor's office or the MJH Laboratory as soon as possible after the 24-hour collection is complete.

5. Specimens should be clearly labeled with the following information:
   a. Patient's name and date of birth
   b. Doctor's name
   c. Date of collection
   d. Time of collection

   The laboratory will reject any specimen that is unlabeled.

NOTES:

a. Normal fluid intake is allowed during 24 hour urine collections.

b. Since results are based on total volume, it is critical that all urine specimens during the 24 hour period are collected.

c. For ease of collection, a collection container may be used during the collection and transferred to the 24 hour urine container.

d. ☢️CAUTION☢️ The urine container may contain strong acid. Be careful not to spill the contents of the container on your skin or clothing. If a spill should occur, wash your skin or clothing with soap and water as soon as possible.
5HIAA 24-Hour Urine Collection Special Instructions

Please avoid the following items at least 48 hours before and during the collection of the 24-hour urine collection.

- Bananas
- Avocados
- Chocolate
- Plums
- Eggplant
- Tomatoes
- Plantain
- Pineapples
- Walnuts
- Tylenol
- Aspirin
- Cough syrup
- Caffeine

If you are taking any other over-the-counter or any prescription medications, please check with your physician before preparing to collect the specimen.
Instructions for Collecting a Sputum Specimen

Sputum is the accumulation of the bronchial and tracheal secretions peculiar to certain disease conditions. It is important to get a specimen from the chest and throat (deep cough), not just saliva (spit).

1. Sputum samples should be collected before beginning any antibiotics prescribed by your doctor.
2. Do not eat for at least 2 hours before collecting the sputum sample.
3. Gargle with plain water just before sample collection to reduce contamination with oral secretions.
4. Sit in a comfortable position.
5. Breathe through your nose to minimize uncontrolled coughing.
6. Take a slow deep breath and hold it for 2 seconds.
7. Cough twice with your mouth slightly open.
8. Repeat as necessary, following appropriate rest periods.
9. Expectorate into a sterile specimen container.

10. Specimens should be clearly labeled with the following information:
   a. Patient's name and date of birth
   b. Doctor's name
   c. Date of collection
   d. Time of collection

   The laboratory will refuse any specimen that is unlabeled.

11. Deliver specimen to the MJH Laboratory as soon as possible on the day the specimen is collected (refrigerate specimen if there will be a delay in transport).

   The laboratory will perform a gram stain to evaluate sputum quality. Specimens with significant oral contamination (saliva) will be rejected and a new specimen will be requested.
Instructions for Collecting a Stool Specimen

1. The best specimen is a fresh diarrheal stool. Specimens obtained with mineral oil, bismuth, or magnesium compounds are unsatisfactory for Ova & Parasite evaluation. Specimen for C. Diff must be liquid. The only exception is for patients with an ileus.

2. Collect stool specimen in clean, dry, plastic stool container. Stool may be collected in a clean bedpan and transferred to the collection container (avoid contamination with urine, soaps or disinfectants).

   Pediatric specimens may be collected in a disposable diaper with a plastic liner or worn inside out (with the plastic covering against the child) and the specimen transferred to the collection container.

3. Specimens should be clearly labeled with the following information:
   
   a. Patient's name
   b. Doctor’s name
   c. Date of collection
   d. Time of collection

   The laboratory will reject any specimen that is not labeled correctly

4. Specimens *MUST* be submitted in a clean specimen cup and delivered to the MJH Laboratory as soon as possible.

5. When transportation of the specimen will be delayed, refrigerate the specimen and deliver within 24 hours of collection.
## General Guidelines for the Collection of Microbiology Specimens

<table>
<thead>
<tr>
<th>Culture</th>
<th>Equipment</th>
<th>Transport/Storage</th>
<th>Instructions/Comments</th>
</tr>
</thead>
</table>
| **Anaerobic Culture**    | Anaerobic Swab OR Syringe with cap             | DO NOT REFRIGERATE                 | 1. Use sterile technique.  
2. Avoid exposing specimen to oxygen.  
3. If using syringe, expel air from syringe, **REMOVE NEEDLE**, and cap syringe before transporting to lab. |
| **Blood Culture**        | Blood Culture Bottles, Needle and Syringe OR Vacutainer Needle for Direct Inoculation | DELIVER TO LAB IMMEDIATELY         | 1. Decontaminate with soap and the iodine.  
2. Decontaminate culture bottle with iodine.  
3. Do not palpate disinfected site.  
| **CSF**                  | LP prep kit with sterile collection tub        | DELIVER TO LAB IMMEDIATELY         | 1. Surgical prep of LP site.  
2. 4-5 cc is optimal for adult, 0.5-1.0 cc for children.  
3. 3rd tube collected during LP is most suitable for culture.  
**NOTE:** If only one tube collected, Micro-biology should receive specimen first to aliquot for multiple tests. |
| **Ear Culture**          | Mini-Culturette Swab                           | 24 hr Room Temperature             | 1. Clean external ear surface.  
2. Swab representative area. |
| **Eye Culture**          | Culturette Swab                                | DELIVER TO LAB IMMEDIATELY         | 1. Cleanse skin around eye with mild antiseptic. Remove make-up or ointment.  
2. Collect by passing sterile saline moistened swab two times over conjunctiva.  
3. Avoid eyelid border and lashes. Culture these separately, if indicated. |
| **Fluid, Cyst, Synovial, etc.** | Surgical Prep Sterile Tube, Syringe with cap OR Culturette EZ II Swab | DELIVER TO LAB IMMEDIATELY         | 1. Surgical prep of site.  
2. Avoid contamination with normal flora from body surfaces. |
| **Genital Culture**      | GENEXPERT® kit for GC and/or Chlamydia         | DO NOT REFRIGERATE                 | 1. See separate instructions for GENEXPERT® kit.  
2. Collect cervical specimens via speculum.  
3. Avoid uninfected mucosal surface.  
4. Clean external urethra prior to urethral specimen collection. |
<table>
<thead>
<tr>
<th>Culture</th>
<th>Equipment</th>
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<th>Instructions/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRSA, Nasal PCR</td>
<td>GENEXPERT® kit for MRSA Copan swab</td>
<td>DO NOT REFRIGERATE</td>
<td>1. Nasal Collection - Swab anterior nares only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 hr Room Temperature</td>
<td></td>
</tr>
<tr>
<td>Nasopharynx Culture, Routine</td>
<td>NP Swab (wire) OR Mini Culturette Swab</td>
<td>DO NOT REFRIGERATE</td>
<td>1. Nasal speculum helpful.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 hr Room Temperature</td>
<td>2. Pass through to posterior nasal pharynx.</td>
</tr>
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<td></td>
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<td></td>
<td>3. Allow swab to remain for a few seconds.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>4. Carefully withdraw swab. DO NOT touch skin.</td>
</tr>
<tr>
<td>Nasal Culture</td>
<td>Culturette Swab</td>
<td>DO NOT REFRIGERATE</td>
<td>Swab anterior nares only.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 hr Room Temperature</td>
<td></td>
</tr>
<tr>
<td>Sinus Culture</td>
<td>Sterile Culture Tube, Syringe with Cap OR Culturette EZ II Swab</td>
<td>DELIVER TO LAB IMMEDIATELY</td>
<td>1. Disinfect nasal mucosa at point of sinus aspiration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DO NOT REFRIGERATE</td>
<td>2. Specimens from &quot;flush out&quot; of sinus not recommended because of contamination from nares organisms.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>3. Recommend a portion of aspirate be cultured for anaerobes.</td>
</tr>
<tr>
<td>Sputum Culture, AFB</td>
<td>AFB Collection System (amber collection container) OR Tracheal Aspirate</td>
<td>REFRIGERATE 24 hr, 4 C</td>
<td>1. See separate patient instruction sheet.</td>
</tr>
<tr>
<td></td>
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<td>2. Recommended screening procedure is 3 first morning specimens, submitted on three consecutive days.</td>
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<td></td>
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<td></td>
<td>3. 24-Hour collections are unacceptable.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>4. 1 cc specimen is minimum.</td>
</tr>
<tr>
<td>Sputum Culture, Fungus</td>
<td>Sterile Specimen Cup</td>
<td>REFRIGERATE 24 hr, 4 C</td>
<td>See separate patient instruction sheet.</td>
</tr>
<tr>
<td>Sputum Culture, Routine</td>
<td>Sterile Specimen Cup</td>
<td>REFRIGERATE 24 hr, 4 C</td>
<td>See separate patient instruction sheet.</td>
</tr>
<tr>
<td>Stool, Clostridium difficile PCR</td>
<td>Clean Specimen Cup (No ParaPak)</td>
<td>REFRIGERATE 24 hr, 4 C</td>
<td>1. See separate patient instructions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Swabs are NOT acceptable because of inadequate specimen volume.</td>
</tr>
<tr>
<td>Stool, Crypto/Giardia</td>
<td>Clean Specimen Cup OR 10% Formalin (preservative)</td>
<td>REFRIGERATE 24 hr, 4 C</td>
<td>1. See separate patient instructions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. This test will be performed unless the patient has been out of the country and this is noted on the test requisition.</td>
</tr>
<tr>
<td>Culture</td>
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<td>Instructions/Comments</td>
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<td>---------------------------------------------</td>
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</tr>
</tbody>
</table>
| **Stool Culture, Routine** (includes Salmonella & Shigella, Campylobacter EIA, EHEC Shigatoxin EIA) | Clean Specimen Cup   | REFRIGERATE 24 hr, 4 C    | 1. See separate patient instructions.  
2. Swab is satisfactory in acute cases, but not for routine specimens.  
| **Stool, Lactoferrin (Leukotest)**          | Clean Specimen Cup   | REFRIGERATE 24 hr, 4 C    |                                                                                       |

**Stool specimens submitted on inpatients > 72 hrs post admission will only be tested for WBCs and Clostridium difficile toxin.**

<table>
<thead>
<tr>
<th>VRE, Perirectal PCR</th>
<th>GENEXPERT® kit for VRE Copan swab</th>
<th>DO NOT REFRIGERATE 24 hr Room Temperature</th>
<th>1. Perirectal collection</th>
</tr>
</thead>
</table>
| **Throat Culture**                          | Culturette Swab                   | REFRIGERATE 24 hr, 4 C                  | 2. Tongue should be depressed while both tonsillar pillars and oropharynx are swabbed.  
3. Exudates should be swabbed and the tongue and uvula should be avoided.  
4. In cases of acute epiglottitis, do not swab throat unless provisions for alternate airway are readily available. |
| **Urine, AFB Culture**                      | Sterile Collection Kit            | REFRIGERATE 24 hr, 4 C                  | 1. Collect "clean-catch" or catheter specimen. See separate patient instructions.  
2. DO NOT transfer to vacutainer. Submit specimen in sterile collection cup provided in clean catch kit.  
3. 3 consecutive first morning specimens is recommended screening protocol (NOT 24 hr collections) |
<table>
<thead>
<tr>
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<th>Transport/Storage</th>
<th>Instructions/Comments</th>
</tr>
</thead>
</table>
| Urine Culture, Indwelling Catheter | Sterile Collection Kit  
10 cc Syringe  
Alcohol Preps | REFRIGERATE  
24 hr, 4 C | 1. Put down a drape to catch any excess urine that might leak during the procedure.  
2. Clamp the distal end of the catheter.  
3. Wipe the edges of the port with the alcohol and then insert the syringe on the port.  
4. Withdraw some urine from the line using the syringe and place in the culture container. Be careful not to withdraw urine from the balloon.  
5. Wipe the edges of the line and port with an alcohol swab and reconnect. |
| Urine Culture, Midstream        | Sterile Collection Kit                        | REFRIGERATE  
24 hr, 4 C | 1. Instruct patient on proper collection of "clean-catch" midstream urine sample. See separate patient instructions.  
2. Transfer portion of urine sample to the gray vacutainer tube, provided in the collection kit.  
3. Early morning specimens yield highest bacterial counts from overnight incubation in bladder. Urine specimens for culture should never be taken from a larger container, i.e., urinal or bedpan. |
| Viral Cultures                  | See separate Viral Culture instructions.      |                            |                                                                                      |
| Wound Culture, Surface          | Culturette Swab  
(2 swabs required if gram stain requested)  
Sterile Saline | REFRIGERATE  
24 hr, 4 C | 1. Disinfect surrounding area with several changes of sterile saline.  
2. Open lesion and express pus onto swab.  
3. Specimen should be obtained from active part of wound. |
| Wound Culture, Deep             |                                               | DO NOT REFRIGERATE  
24 hr Room Temperature | 1. Aseptic preparation of the aspiration site.  
2. Overlying and adjacent areas must be avoided to eliminate contamination with normal flora. |
Instructions for Collection of Specimens for Chlamydia/GC Testing

Gene Xpert CT/NG collection swabs:
SPECIMEN STABILITY: 60 days stored at 2°C to 30°C

- Utilized for CT/NG testing on all women ≥ 14 years of age.
- The Gene Xpert CT/NG collection swabs are stocked by Materials Management and are available on nurse servers.
- When collecting endocervical samples using the Gene Xpert CT/NG collection swabs, please be sure to utilize the larger swab provided in the collection kit to thoroughly clean away all mucus, blood, and/or lubricant from the collection site. If the area is not cleaned well the above mentioned may interfere with the test and inhibit test results.

Urine samples for CT/NG:
SPECIMEN STABILITY: 24 hours room temperature, 6 days refrigerated

- Testing available for males and females ≥ 14 years of age.
- Must be first catch urine (“dirty urine”). Patients should not have urinated for at least one hour before specimen collection. Female patients should not cleanse the labial area before providing the specimen. Specimen should be submitted in a sterile cup. Specimens submitted in preservative are unacceptable for testing.
- Clean catch urine may yield false negative results.

APTIMA Combo 2 Assay Unisex collection swabs:
- Utilized for testing on women <14 years of age and all urethral collections for males.
- The APTIMA Combo 2 Assay Unisex collection swabs are stocked by the Laboratory and are available by calling ext. 7170.
Endocervical Specimen Collection

1. The Xpert® CT/NG Vaginal/Endocervical Specimen Collection kit contains:
   - Individual Collection Kit
   - Cleaning Swab

2. Remove excess mucus from the cervix and surrounding area using the large individually wrapped cleaning swab. Discard the swab.

3. Open package that contains the pink-capped Xpert Swab Transport Reagent tube and individually wrapped collection swab. Set the tube aside before beginning to collect sample. Open the collection swab wrapper by peeling open the top of the wrapper.

4. Hold the swab in your hand, placing your thumb and forefinger in the middle of the swab shaft.

5. Insert the collection swab into the endocervical canal. Rotate the swab clockwise for 10-30 seconds in the endocervical canal. Withdraw the swab carefully.

6. Unscrew cap from the transport tube. Immediately place the specimen collection swab into the transport reagent tube.

7. Identifying the scoreline, break the swab shaft against the side of the tube. Discard the top portion of the swab shaft.

8. Re-cap the transport reagent tube and tighten the cap securely. Label the transport tube with the sample identification information, including date of the collection, as required.
Vaginal Swab Specimen Collection

1. Open the collection tube containing the transport tube and swab.
2. Clean the vaginal area with soap and water.
3. Gently insert the swab into the vagina and rotate 10-30 circles.
4. Draw the swab and continue to hold it in your hand.
5. Unscrew the cap from the transport tube.
6. Immedately place the collection swab into the transport tube.
7. Dispose of the cap in the top portion of the tube.
8. Rinse your hands with soap and water.

Note: Health care provider should label the sample identification card of the collection.
General Guidelines for Collection of Specimens for Virus Isolation

Clinical specimens for virus isolation are referred to the University of Virginia Virology Laboratory. Viral transport media is available in the MJH laboratory.

The collection of a proper specimen and its correct handling are critical steps in virus isolation. Specimens for virus isolation must be collected and processed in a different manner than those for routine microbiological studies. The following guidelines should be followed in submitting specimens for virus isolation:

1. The amount of virus is usually maximal at or just after the appearance of symptoms, so that specimens should be collected as early as possible in the course of illness.
2. Most viruses are inactivated by adverse environmental conditions and/or delays in specimen processing. Whenever possible, specimens for isolation should be submitted fresh in the morning and be transported on wet ice as soon as possible to the UVA Microbiology Lab. For unavoidable delays, specimens may be held at 4°C (refrigerator) overnight, but they should not be frozen at -20°C (regular freezer).
3. Bacterial overgrowth can seriously hinder efforts at virus isolation. Specimens should be collected aseptically with attention to minimize contamination by resistant bacterial flora and should be processed promptly.
4. The following guidelines are made in regard to collection of specific types of specimens:

   **Swab specimens:** Collect with sterile, cotton-tipped swab which can be pre-moistened with sterile saline or distilled water, but *not* VTM. Break off swab into vial of VTM.

   **Vesicle fluid:** Collect from an intact fresh vesicle. Cleanse vesicle and surrounding skin with alcohol and allow to dry.

   Exception: For identification of Varicella-Zoster virus, optimal results are obtained by preparing a direct smear of cells from the lesion base for immunofluorescence testing paired with a culture of the vesicle fluid for Herpes simplex virus.

   **Blood:** Submit 10 ml (5ml for children) in purple top vacutainer tube (requires special processing, submit only between 0600 and 1330.)
<table>
<thead>
<tr>
<th>Analyte</th>
<th>Acetic Acid (50%, 25 ml)</th>
<th>HCL (30 ml of 6N)</th>
<th>Boric Acid (1-2 g)</th>
<th>Na₂CO₃ (5g)</th>
<th>No Preservative</th>
<th>Special Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrenal Group (Catecholamines, VMA Metanephrines, Fract.)</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aldosterone *</td>
<td></td>
<td></td>
<td>yes</td>
<td>yes</td>
<td></td>
<td>Refrigerate during collection. Befroe shipping, add 1g boric acid/100 ml urine and refrigerate</td>
</tr>
<tr>
<td>Arsenic</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td>yes</td>
<td></td>
<td>Refrigerate if no preservative</td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
<td></td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catecholamines (Fractionated)</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catecholamines (Fractionated with Creatinine)</td>
<td>yes</td>
<td>yes</td>
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<td>CEA</td>
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<td>Refrigerate</td>
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<tr>
<td>Chloride</td>
<td></td>
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<td>Citrate</td>
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<td>Copper</td>
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<td>yes</td>
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<td>Collect in acid-washed container</td>
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<tr>
<td>Coproporphyrins, Quantitative</td>
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<td></td>
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<td></td>
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<td>Protect from light and refrigerate</td>
</tr>
<tr>
<td>Cortisol (Free)</td>
<td></td>
<td></td>
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<td>yes</td>
<td></td>
<td>Refrigerate if no preservative</td>
</tr>
<tr>
<td>Cortisol, Free with Creatinine</td>
<td></td>
<td></td>
<td></td>
<td>yes</td>
<td></td>
<td>Refrigerate</td>
</tr>
<tr>
<td>Creatine</td>
<td></td>
<td></td>
<td></td>
<td>yes</td>
<td></td>
<td>Refrigerate</td>
</tr>
<tr>
<td>Creatinine</td>
<td></td>
<td></td>
<td>yes</td>
<td>yes</td>
<td></td>
<td>Refrigerate if no preservative</td>
</tr>
<tr>
<td>Creatinine Clearance</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td>yes</td>
<td></td>
<td>Refrigerate if no preservative; draw blood within 2 hours after urine collection.</td>
</tr>
<tr>
<td>Cystine</td>
<td></td>
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<td>Note if patient is on penicillamine therapy</td>
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<td>Delta-Aminolevulinic Acid (ALA)</td>
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<td>Electrolytes</td>
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<td>yes</td>
<td></td>
<td>Refrigerate</td>
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<tr>
<td>Glucose, 24 hr</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
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<td>*All containers should include 2g of sodium fluoride</td>
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<td>Heavy Metals Group</td>
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<td>Homovanillic Acid (HVA)</td>
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<td>17-Hydroxycorticosteroids</td>
<td>yes</td>
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<tr>
<td>Analyte</td>
<td>Acetic Acid (50%, 25 ml)</td>
<td>HCL (30 ml of 6N)</td>
<td>Boric Acid (1-2 g)</td>
<td>Na₂CO₃ (5g)</td>
<td>No Preservative</td>
<td>Special Instructions</td>
</tr>
<tr>
<td>---------------------------------------------</td>
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<td>(17-OH)</td>
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<td>Immunelectrophoresis, Profile</td>
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<td>yes</td>
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<td>Refrigerate if no preservative</td>
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<tr>
<td>Iron, Urine, Atomic Absorption</td>
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<td>17-Ketogenic Steroids</td>
<td>yes</td>
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<td>17-Ketogenic Steroids with Creatinine</td>
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<td>17-Ketosteroids</td>
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<td>17-Ketosteroids with Creatinine</td>
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<td>yes</td>
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<td>Lead</td>
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<td>Magnesium</td>
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<td>Mercury</td>
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<td>Metanephrines, Fractionated</td>
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<td>Methylmalonic Acid</td>
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<td>Microalbumin</td>
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<td>Oxalate (Oxalic Acid) Urine</td>
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<td>Phosphorus</td>
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<td>Porphobilinogen, Quan.</td>
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<td>Porphyrins, Fract. (Coproporphyrin/ Uroporphyrin)</td>
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<td>Protect from light and refrigerate</td>
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<td>Porphyrins, Qual.</td>
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<td>Protect from light and refrigerate</td>
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<td>Potassium</td>
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<td>yes</td>
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<td>No preservative preferred; refrigerate if no preservative</td>
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<tr>
<td>Protein Electrophoresis</td>
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<td>No preservative preferred; refrigerate if no preservative</td>
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<tr>
<td>Protein(Albumin) Total</td>
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<td></td>
<td>No preservative preferred; refrigerate if no preservative</td>
</tr>
<tr>
<td>Analyte</td>
<td>Acetic Acid (50%, 25 ml)</td>
<td>HCL (30 ml of 6N)</td>
<td>Boric Acid (1-2 g)</td>
<td>Na₂CO₃ (5g)</td>
<td>No Preservative</td>
<td>Special Instructions</td>
</tr>
<tr>
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<tr>
<td>Sodium</td>
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<td>yes</td>
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<td>yes</td>
<td>No preservative preferred; refrigerate if no preservative</td>
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<tr>
<td>Testosterone</td>
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<td></td>
<td>yes</td>
<td>Refrigerate if no preservative</td>
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<tr>
<td>Urea Nitrogen</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td>yes</td>
<td>Refrigerate if no preservative</td>
</tr>
<tr>
<td>Uric Acid</td>
<td></td>
<td>yes</td>
<td>yes</td>
<td></td>
<td>yes</td>
<td>Refrigerate; must be analyzed within 24 hours of collection. No preservative preferred.</td>
</tr>
<tr>
<td>Urobilinogen, Quan.</td>
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<tr>
<td>Uroporphyrins</td>
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<td>Vanilmandelic Acid (VMA)</td>
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<td>VMA by HPLC</td>
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<td>yes</td>
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<td>Zinc</td>
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<td>Refrigerate if no preservative</td>
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