Laboratory:	Document Type:	Original Date Adopted:	Previous Document:
Lab Admin	Policy / Procedure	09/12/2003	ADMIN-91 Revision 8

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Approval and Acknowledgements
Refer to QPulse system and Document Details report for laboratory directors(s)' electronic signature approval, employee acknowledgment and effective date.

1. POLICY

1.1. Clinical laboratory testing and/or anatomic pathology examination will be performed at the written or electronic order of a physician or authorized practitioner only.

1.2. All specimens submitted to the laboratories must have complete and legible patient identification on the specimen container(s), whether primary or an aliquot.

1.3. Specimen collection procedures and phlebotomy practices are designed to provide for the minimum blood collection volumes required for testing to prevent blood losses from phlebotomy, particularly in pediatric patients and those with many venipunctures. Adverse consequences of excess venipunctures include complications during collection for patients and health-care workers, hazards from subsequent transfusions, contending with increased amounts of hazardous waste, and greater cost. Suggested solutions include carefully considering the need for laboratory tests, avoiding unnecessary repetition of tests, and minimizing use of standing orders.

1.4. Laboratory Guide to Services will be provided to all medical center staff and laboratory clients. This document is always available on OneSource under Clinical Labs, Laboratory Policies and Procedures.

2. PURPOSE OF DOCUMENT

This document is to provide a written policy for the acceptable standards of requisitions/order entry, specimen collection and identification for clinical and anatomic pathology testing within OSUWMC Laboratories.

3. SCOPE OF DOCUMENT

This document applies to all areas and all personnel that are responsible for the collection and identification of patient samples within OSUWMC and any and all outside clients that utilize OSUWMC Laboratories for patient testing.

4. RESPONSIBILITY

The Medical Director of the Clinical Laboratories is responsible for establishing the *Laboratory Guide to Services: Standards for Acceptable Clinical and Anatomic Pathology Specimen & Collection Procedure*. Laboratory compliance is responsible for maintaining the document and ensuring at least biennial review.

5. The following sections are included:

5.8.1. Venipuncture
5.8.2. Arterial/Line Draw Specimens
5.8.3. Indewelling Catheters, Hep or Saline Locks, VAD
5.8.4. Capillary Skin Puncture
5.8.5. Blood Culture Specimens
5.8.6. Microbiology Samples
   a. *Neisseria gonorrhea/Chlamydia trachomatis* by Amplified detection
   b. Tzanck Prep (Herpes and/or Varicella Zoster)
   c. Affirm Collection
5.8.7. Midstream, Clean Catch Urine
5.8.8. Random Urine Collection
5.8.9. 24 Hour / Timed Urine Collection
5.8.10. Collection of Fluids
5.8.11. Meconium Screen for Drugs of Abuse
5.8.12. Cord Blood for Drugs of Abuse Screen
5.9. Requests for Pathology or Cytology Examination

6. REQUISITION REQUIREMENTS:

6.1. A written or electronic request form must accompany every specimen and the identification information on the specimen and requisition must be identical. The requisition form *must* contain **all** the following information:

▪ patient's full first and last name	▪ For **non-OSU** providers also: **Provider NPI number**
▪ identification number	
▪ date of birth	▪ service(s) requested
▪ location	▪ **Note - for outpatients also**: diagnosis (ICD10) code for clinical indications for examination request; i.e. signs, symptoms, diagnosis
▪ ordering physician / provider name and **signature <u>required</u>** (electronic signature acceptable)	
▪ attending physician name (if different from ordering physician)	

Per OSUWMC Medical Staff Administrative Policy: requests for laboratory services or pathologic examination for outpatients, which do <u>*not*</u> include ordering physician / provider signature or diagnosis information will not be processed or tested until such information is obtained from the ordering physician / provider

6.2. Tests requiring paper requisitions in addition or in lieu of electronic requisitions are:
6.2.1. Microbiology:
   a. Environmental Water Testing
   b. All OR samples (task force created in 2013)
6.2.2. Surgical Pathology Samples (including limb disposition form and frozen section form)
6.2.3. Cytology Samples
6.2.4. OURSA Samples
6.2.5. Toxicology Chain of Custody forms
6.2.6. Transfusion Services Samples

7. SPECIMEN CONTAINERS:

7.1. In accordance with OSHA safety regulations, all primary specimen containers must be leak proof and placed in a secondary leak proof container for transport to the laboratory. Securely self-sealed plastic bags are used for this purpose. Requisitions forms are to be placed in the *outer* pocket.

8. TRANSPORTATION OF LABORATORY SPECIMENS

8.1. All laboratory specimens should be transported the laboratory as quickly as possible and specific temperature and special collection requirements must be maintained throughout transportation. For applicable inpatient testing, the specimens should be delivered to the laboratory using the pneumatic tube system or employee deliveries. For specific test and collection requirements refer to the laboratory guide to services

8.2. Laboratory Specimens NOT APPROVED for transport in the PTS – walk down / hand deliver to the appropriate laboratory

8.2.1. Specimens requiring a consent to obtain (i.e., tissue or pathology specimens obtained via surgical procedures, spinal taps, fine needle aspirations, biopsies etc.)

a. Bone marrow
b. Amniocentesis fluid
c. Arthrocentesis fluid
d. Bronchial lavage washing or brushing
e. Cordocentesis
f. Pericardial fluid
g. Peritoneal fluid
h. Pleural fluid
i. Specimens obtained in the OR
j. Spinal fluid
k. Thoracentesis fluid
l. Tissue Specimens
m. Vitreous/aqueous fluid
n. Fine Needle Aspiration Specimens
o. Cytology Specimens – Pap Smears / Tzanck Smears

8.2.2. For specimens that are difficult to collect, irretrievable or time-dependent on collection - is it highly recommended that the unit walk down or hand deliver the specimens to the laboratory

a. Neonatal heel-stick
b. Arterial puncture blood

8.2.3. Samples for High Risk of spilling, leaking, breaking

a. Any test collected in a glass vacutainer :ie. Navy blue top for Heavy Metals.

8.2.4. For specimens that are life-threat or critically stat- is it highly recommended that the unit walk down or hand deliver the specimens to the laboratory

8.3. Other specimens that must be hand delivered to the laboratory:

8.3.1. Formalin or alcohol preserved specimens
8.3.2. Specimens transported in a Lukens trap
8.3.3. Cerebral Spinal Fluid (CSF) samples
8.3.4. Platelet testing: PFA(platelet function screen), P2Y12, and Platelet Aggregations

9. SPECIMEN LABELING & IDENTIFICATION:

9.1. Correct identification of patient specimens is essential for reporting accurate laboratory results. The responsibility for labeling a specimen and verifying all information on the requisition match is that of the person who collects the specimen.

9.2. Sites (inpatient and outpatient) with access to IHIS should label specimens with the printed lab barcode label. In circumstances of interface or computer downtime (scheduled or unscheduled), patient chart labels are acceptable. In circumstances of unexplained continual label printing problems, call the HELP desk for assistance in fixing the issue(293-3861). Specimen barcode labels should be secure and placed vertically with no wrinkles or folds. Refer to figure 1 below. Outpatient collection sites that are not interfaced with the OSUWMC IHIS system must follow specimen labeling requirements listed below. At all times, patient specimens must include **two patient identifiers**.

9.2.1. **Patient Sample Labeling Requirements**: Verify labels for the specimen tubes and for any paper requisition or electronic order notice (IHIS, Atlas) are completely identical to the patient identification bracelet

a. Patient's full first and last name
b. If a middle initial or suffix is being used by the patient it must be identical on all the above
c. Medical record number or URL number (URL number may be used only for Type & Screen Only)
d. Initials of the individual collecting the sample, as applicable.

9.2.2. **Specimens for Transfusion Services** require a mandatory signature of the person collecting the patient sample on the specimen, requisition and also when placing the green transfusion identification band on the patient.

- Record the appropriate signature of the person verifying patient identification and collecting the specimen, date and time on all specimen labels and requisitions printed from IHIS and the transfusion identification (green) armband.
- Signature may be full first and last name or first initial and last name as long as each signature is identical on all labels and the requisition
- The signature and other handwritten information MUST be legible and in indelible ink
- All Transfusion Services samples deemed unacceptable by Transfusion Services will need to recollected.

9.2.3. **Anatomic Pathology & Cytology Specimens:**

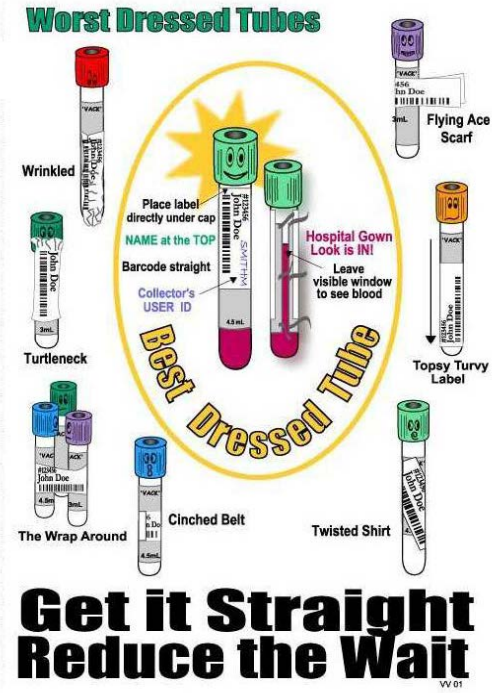
a. All specimens must be submitted in a rigid, puncture resistant, sealed container.
b. All specimens submitted must have accurate, complete, and legible patient identification on each specimen container. Do not place the patient identification on the container lid. Identification of the specimen must include both the patient's full first and last name and identification number. Specimen identification should be performed at the patient's side to ensure accurate labeling.
   - Each slide submitted for examination must be labeled with patient's full name and identification number. Do not label the outside of the container (folder) with patient identification.
c. The number of containers submitted (designated as container A, B, C, etc or 1, 2, 3 etc).
d. Any solution / preservative / fixative in which the specimen is submitted.
e. The date of the procedure or the date tissue was 'taken'.
f. Pertinent clinical history
g. For gynecologic PAP exam: last menstrual period, previous PAP smear, history of hormone therapy and indication for HPV testing (if ASC-US or regardless) if applicable.
h. For Products of Conception (POC) provide a gestational age in weeks on the requisition form
i. The tissue type, site, and orientation must also be specified for each container (skin, placenta, gall-bladder or right/left, suture at 12:00, etc.). If the specimen needs orientation, use sutures to clearly indicate margins, i.e. 1 suture = 12:00, 2 sutures = 3:00. Do not use needles or bent needles for orientation or to affix specimen to another object (such as a tongue depressor). Do not use water-soluble ink. Do not incise the specimen.
   - Any solution / preservative / fixative in which the specimen is submitted must also be specified on the container and requisition form.
   - In the event a specimen comes with a single container, AND all patient identification exactly matches on both the requisition and container, AND the requisition indicates the type/site of tissue submitted, the type/site of tissue does NOT have to be written on the container.
   - In the case of multiple containers for a specimen: if the multiple containers are each labeled as 1, 2 or 3, or A, B or C, etc., AND the patient identification exactly matches on both the requisition and each container, AND the requisition indicates the type/site of tissue submitted for each container, the type/site of tissue does NOT have to also be written on the container.
j. Cytology specimens received without a physician order will be kept for up to 7 days. Cytology will make every attempt to obtain a physician order and verify if the specimen should be processed for cytology.

9.3. Best Laboratory Practices: When labeling patient samples, be certain to never completely cover a pre-

existing label, if applicable. When labelling, place the "top" of the new label directly below the patient's name and medical record number to allow for visual validation that the proper label has been adhered to the correct patient sample

9.4. All specimens other than blood must be labeled with the type and/or site of the specimen

Figure 1



10. IDENTIFICATION ISSUES AND CORRECTIVE ACTIONS:

10.1. Specimens requiring and eligible for corrective action will be preserved and retained until resolution has been completed, notification to discard has been received and documented from the ordering practitioner, the integrity of the specimen is no longer acceptable or an unacceptable resolution is not available which would require recollection.

10.2. If testing cannot be performed or a test result cannot be provided for any reason, laboratory personnel will notify appropriate clinical personnel responsible for the patient.

10.3. All requests from a physician to perform testing on an unsatisfactory specimen must be approved by the division director, Medical Director or attending pathologist on call.

a. Monday – Friday (excluding holidays), 8:00am – 5:00pm: notify the appropriate division director.
b. If the division director is not available, contact the Clinical Laboratories' Medical Director.
c. If the Medical Director is not available, contact the attending pathologist on call.
d. All other hours, weekends, holidays - contact the attending pathologist on call.

- Give the patient, specimen and physician information to the pathologist.
- They will contact the physician and determine whether testing will be performed.
- If testing is to be performed, append the following to the result along with the condition code
  - Test performed at MD request _____ (full name), date, time
  - Test cleared by attending pathologist _____ (full name), date, time

10.4. **Unlabeled specimen:** A specimen with no label or patient identification on the primary container

10.5. **Mismatched specimen:** Specimen identification information does not exactly match the information on the requisition form.

10.6. **Mislabeled specimen**: Specimen and requisition form identification information match, but the specimen belongs to another patient.

10.7. **Unsatisfactory/sub-optimal specimens (specimens with conditions affecting results) that require recollection:** venipuncture blood (excluding blood culture specimens), urine, sputum, feces/stool, and line-draw blood specimens.

a. QNS (insufficient quantity for testing)
b. Hemolyzed
c. Clotted
d. Icteric
e. Lipemic
f. Contaminated
g. Improper collection container
h. Transportation delays
i. Improper storage.

***** Laboratory staff should verify other orders on a patient prior to contacting nursing for a recollection to eliminate multiple recollect draws and unnecessary venipunctures for the patient.**

10.8. **Attached Needles (Potential Needle sticks)**: The clinical or anatomic pathology laboratories will not accept any blood or body fluid specimens with a needle attached. These specimens are a physical and biological hazard to the laboratory personnel and are identified as unacceptable specimens.

10.8.1. When a specimen is received with a needle attached, call the unit to inform them that we have received an unacceptable specimen.

10.8.2. Request the unit personnel to arrange for the specimen to be returned to the unit or to remove the needle and recap the specimen.

10.8.3. When appropriate, the person delivering the specimen can take responsibility to make the specimen acceptable (remove needle and recap).

10.8.4. Retain the specimen for an appropriate amount of time to allow the units to provide an acceptable specimen.

10.9. **FOR INPATIENTS AND ED PATIENTS**: notification will be made by entry in the appropriate Lab Information System and by telephone immediately.

a. Processing personnel:
- Enter appropriate crediting code in the LIS for specimens with insufficient quantity for testing, improper collection container, transportation delays, or improper storage.
- Notify the appropriate clinical personnel and document notification when completed.
- Modify results in the computer to document telephone notification. Include:
  - First and last name and title (e.g. Dr., RN, or MA) of person notified
  - Date of notification
  - Time of notification

b. Testing personnel:
- Enter appropriate crediting code in the LIS for clotted, hemolysis, icteric, lipemia or contaminated specimens for which no results can be provided.
- Notify the appropriate clinical personnel and document notification when completed.
- Modify results in the computer to document telephone notification. Include:
  - First and last name and title (e.g. Dr., RN, or MA) of person notified
  - Date of notification
  - Time of notification

10.10. **FOR OUTPATIENTS OR OUTREACH PATIENTS:** notification will be made in the same manner as for Inpatients/ED patients above, except that telephone notification will be made the next business day.

10.11. **Irretrievable Samples:** Specimens for which recollection is not mandatory

IRRETRIVABLE SAMPLES

Amniocentesis fluid	Arterial puncture blood
Arthrocentesis fluid	Blood cultures
Bone marrow	Bronchial lavage washing or brushing
Cordocentesis	Neonatal heel-stick
Pericardial fluid	Peritoneal fluid
Pleural fluid	Specimens obtained in the OR
Spinal fluid	Thoracentesis fluid
Tissue Specimens	Vitreous/aqueous fluid

Timed therapeutic drug monitoring specimens
Fine Needle Aspiration Specimens

10.11.1. When the laboratory has received an improperly identified irretrievable specimen, call the patient care area to inform them that we have received an unacceptable specimen with an identification error and a Laboratory Release form must be completed. Complete the Patient Identification, Specimen/Test Information, and Problem sections of the Laboratory Release Form. The person who collected the specimen must complete the release form to establish the identification of the specimen. Release forms must be completed in person (or by authorized facsimile transmission for outreach/ off-site patients); no verbal verification is permitted. NOTE: For outpatients that are no longer available at the collection site: a Laboratory Release form must be completed

10.11.2. If after 2 attempts to obtain the appropriate identification verification the specimen identification discrepancy has not been resolved, proceed as follows:

a. Process and preserve specimens until resolution is completed
b. For body fluid cell counts, CBC, and coagulation specimens:
   - Make a copy of the requisition and place an "ID Discrepancy - Hold Results" sticker on it.
   - Deliver the specimens and requisition copy to appropriate testing area. All the tests should be run off line and then this information given to customer service. NONE OF THE TESTS SHOULD BE FILED.
   - The testing area will return specimens, the test printout / results, and requisition to the Customer Service section.
   - Enter the collection/identification issue into the Patient Safety Reporting (PSR) system as appropriate.

10.11.3. When customer service receives the required information, accession the specimens. The various areas can perform the testing on the preserved specimens or file the "Hold Results" tests.

10.11.4. Using the script that follows send an e-mail (**@osumc.edu addresses ONLY**) to the ordering physician, any other physicians associated with the specimen/request, lab customer service and the lab medical director.

The Clinical Laboratories received a request for laboratory services from you on insert date and there was a specimen identification discrepancy. (Indicate only ONE of the following):

The two identifiers on the requisition do not exactly match the 2 identifiers on the specimen container.
There is no identification information on the specimen container.
There is no identification information on the request form.
The identification information on the request form and/or specimen container is incomplete.

We cannot provide the requested services without resolving this discrepancy. We contacted your patient care area twice to obtain a completed Laboratory Release form to establish the identification of the patient specimen, but have not received the requested documentation.

Please contact Main Campus Laboratory at 614.293.8375 or East Campus Laboratory at 614-257-3999 (or by *replying to all* on this email) and provide a fax number to which the *Laboratory Release Form* can be sent so you can complete Identification Verification section and return completed form to us.

The specimen integrity has been maintained, and upon receipt of the requested verification we will be able to perform the requested services and provide the results, OR **if so instructed by you**, discard the specimens.

We apologize for any inconvenience or delays this causes for you and/or your patient.

11. **BLOOD COLLECTION TUBES:** A variety of blood collection tubes and urine preservatives are necessary to maintain sample stability until testing can be performed in the laboratory. Some of the most commonly used tube types and their contents are outlined below.

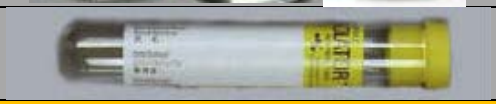
***** Always refer to the general test listings for tube types and special requirements for individual tests. Navy, lavender, light blue, mint green, yellow, gray, and green top tubes must be mixed thoroughly. Specimens to be sent on ice or wrapped in foil must be sent this way without exception. SPECIMENS WITH NEEDLES ATTACHED WILL NOT BE ACCEPTED**

Tube Type	**Characteristics and Uses**
Yellow Top Tube (SPS) Label Code: ISOLATOR	SPS (Sodium Polyanetholesulfonate) is used as an anticoagulant. For microbiological culturing. **Caution**: Do **not** substitute ACD Yellow Top tube for these specimens. Must be well mixed by gentle inversion after sample collection.
Light Blue Top Tube Label Code: BLUE	Contains 3.2% buffered sodium citrate. Use a discard tube if this is the first tube to be drawn and using a butterfly collection set. Must be well mixed by gentle inversion after sample collection & cannot be clotted or contain clots. Used for most coagulation procedures. Must contain specified volume of blood.
Brick Red Top Tube Label Code: BRICK or BR	Plain non-additive tube.
Serum Separator Tube Gold Top Tube Label Code: GOLDSST	Contains gel and clotting activators (must treat like an additive) to enhance separation of RBCs from serum. Used for most Endocrinology and Special Function procedures. **Note**: Cannot be used for Blood Bank.
Mint Green Top Tube Label Code: MINTGR	Contains lithium heparin. Used for most Chemistry procedures. Cannot be used for Special Function procedures.
Green Top Tube Label Code: GREEN	Contains sodium heparin. Must be well mixed by gentle inversion after sample collection. **Note**: Cannot be used for coagulation studies. Generally used for iced samples.
Navy Blue Top Tube **(With Red label)** Label Code: NAV-SER / SN	Contains no additive. This is serum for copper, zinc, iodine, and other trace elements.
Navy Blue Top Tube (**With Purple Label**) Label Code: NAVEDTA /NB	Contains EDTA. Whole blood for Leads, heavy metals, and other trace elements.
Tube Type	**Characteristics and Uses**

Lavender Top Tube Label Code: LAV	Contains EDTA as an anticoagulant. Must be well mixed by gentle inversion after sample collection. Used for a variety of Hematology and Blood Bank tests. **Note**: Cannot be used for coagulation studies and cannot be clotted or contain clots.
Gray Top Tube Label Code: GRAY or GRY	Contains potassium oxalate and sodium fluoride. Used for glucose tolerance tests. Must be well mixed by gentle inversion after sample collection.
Yellow Top Tube (ACD) Label Code: YELLOW	ACD (Acid Citrate Dextrose). Used for Blood Bank & Tissue Typing Lab; HLA testing. **Caution**: Do **not** substitute SPS Yellow Top tube for these specimens. Must be well mixed by gentle inversion after sample collection. **DO NOT USE FOR MICROBIOLOGY**.
Grey Topped Urine Collection	Contains Boric Acid preservative to hold bacterial growth at a static state after collection. Must be filled to the Fill line to ensure proper urine: preservative ratio.
Bactec Blood Culture Collection Bottles	Used for the aerobic and anaerobic culture and recovery of microorganisms (bacteria and yeast) from blood. Aerobic, Anaerobic and PEDS-Plus bottles available**.** **Note**: Not used for fungal or AFB blood cultures.

12. ORDER OF DRAW:

When multiple samples are drawn, special attention should be given to the order in which tubes are filled. Draw specimens for blood cultures first to prevent possible contamination from non-sterile stoppers. Draw tubes with no additives before tubes with additives (e.g. clotting activators or anticoagulants).

Lid Color	**Collection Tube/Additive**
	**BD Bactec Blood Culture Collection Tubes** **8-10 mL of blood for full draw** **1-3 mL of blood in pediatric draw vials** **OR**
	**BD Vacutainer SPS Culture Tube**
If not drawing blood culture, START here:	
If drawing with a butterfly or from a line, an appropriate amount of waste blood must be drawn for discard to eliminate contamination and erroneous results. Typically one waste tube or 5ml.	
	**Citrate Tube: must be filled to fill line**
If not drawing blood cultures or coagulation testing, START here:	
	**BD Vacutainer SST Gel Separator Tube**

	**Serum Tube no gel**
	**Heparin Tube (lithium or sodium depending on test)**
	**EDTA Tubes**
	**Fluoride (glucose) Tube**
Remember to mix by gentle inversion to ensure adequate mixing of additives and patient sample	

13. SPECIMEN COLLECTION PROCEDURES:

13.1. Regardless of method collection, always follow these same basic principles:

13.1.1. Identify yourself to the patient, where you are from and what you will be doing.

13.1.2. Verify patient identification using at minimum 2 patient identifiers

a. **Patients with an identification bracelet**: double-check name and medical record number & have patient verbally verify their identity by stating name and date of birth. Compare with information on identification bracelet, patient order and specimen labels.

- If the patient is unable to verbally verify, double check name and medical record number against the patient armband
- Notify the patient's professional caregiver (or phlebotomist's supervisor) if there are any discrepancies in the name or medical record number
  - DO NOT DRAW THE SPECIMEN UNTIL DISCREPANCIES ARE RESOLVED
- **For collection of specimens for "Type and Cross":** Verify that labels for the specimen tubes, labels for any paper requisition or electronic order notice, and labels for the transfusion identification band (green armband) are completely identical to the patient identification bracelet.
  - Document the signature of the person verifying patient identification and collecting the specimen, including the date and time of collection, on all specimen labels, requisitions and on the transfusion identification (green armband). **The signature is mandatory** and must be legible for all specimen labels, requisitions and green armbands in order to process all crossmatch samples.
  - Place the transfusion identification band on the patient's extremity and again verify against the patient identification bracelet
  - Transfusion Services Samples exempt from the green transfusion identification armband are: Type & Screens, DATO (ABO/RH), Transfusion Reaction Workups, Kleihauer Betke, and Prenatal Specimens.

b. Patients with no identification bracelet: match verbal information to request form or tube labels

- Verify the patient's identity by asking them to repeat their name and date of birth. OR
- If patient is unconscious, mentally incompetent or does not speak the language, verify identity with a nurse or family member

13.1.3. Patient inquiry – refer to physician

13.1.4. Patient refusal – do not argue, report to attending nurse

13.2. **ORDER OF DRAW**: see ORDER OF DRAW section

13.3. **REAGENTS/SUPPLIES:**

13.3.1. 70% Isopropyl alcohol pads or Providone Iodine swab sticks
13.3.2. Single-use Latex-free Tourniquet
13.3.3. 21-gauge multi-draw, single-draw, and 23-gauge scalp vein needles: select the appropriate type of needle based on the patient's physical characteristics and the amount of blood to be drawn.
13.3.4. Single-use Vacuum tube holder(s)
13.3.5. Evacuated tubes: select the appropriate tubes based on the test(s) requested
13.3.6. Single Use Latex-free Gloves
13.3.7. Gauze pads or cotton balls (should be used on patients with dermatitis)
13.3.8. Dermal tape

NOTE: INTACT AND CLEAN GLOVES MUST BE WORN DURING THE ENTIRE VENIPUNCTURE PROCEDURE.

13.4. **COLLECTION OF BLOOD VIA VENIPUNCTURE:** Proper collection of venous blood for clinical laboratory tests is essential to provide accurate patient test results. To avoid interferences in laboratory methods, it is imperative that the correct procedure for collection and handling of blood specimens be followed

13.4.1. **Factors Affecting Venipuncture Specimen:**

a. Alcohol must be dry – it may cause hemolysis.
b. Increased tourniquet time (longer than one minute) may result in localized stasis with hemoconcentration and the possible formation of a hematoma due to infiltration of blood into tissue. This may result in erroneously high values for all protein-based analytes, packed cell volume, and other cellular elements.
c. Cross contamination of tube additives may result in erroneous results if tubes are not maintained below the venipuncture site
d. Preventing a hematoma – remove tourniquet first, use major superficial veins, fully penetrate uppermost wall of vein (partial penetration allows blood to leak into tissue), apply pressure to venipuncture site. Before bandaging, ensure the puncture to the vein has sealed by observing for hematoma formation after pressure is released.
e. Preventing hemolysis – mix anti-coagulated blood gently, avoid needles that are too small, assure needle is fitted securely to prevent frothing

13.4.2. **Hazards of Venipuncture:** A patient's life may depend on vein patency. It is important to select the vein site carefully because the veins provide an avenue of entry for transfusion, infusion, and therapeutic agents. If, during the procedure, artery puncture is suspected, direct forceful pressure must be applied to the puncture site for a minimum of 5 minutes upon removal of the needle or until active bleeding has ceased. Notify the nursing staff and physician immediately.

a. Fainting
- if patient is sitting, lower their head and arms
- loosen tight clothing
- apply cold compresses to the forehead and back of neck.
- notify nurse or physician **immediately**

b. Nausea
- make patient comfortable
- instruct patient to breathe deeply and slowly
- apply cold compresses to forehead
- notify nurse or physician i**mmediately**

c. Vomiting
- give patient an emesis basin and tissues

- have water for patient to rinse their mouth
- notify nurse or physician **immediately**

d. Convulsions

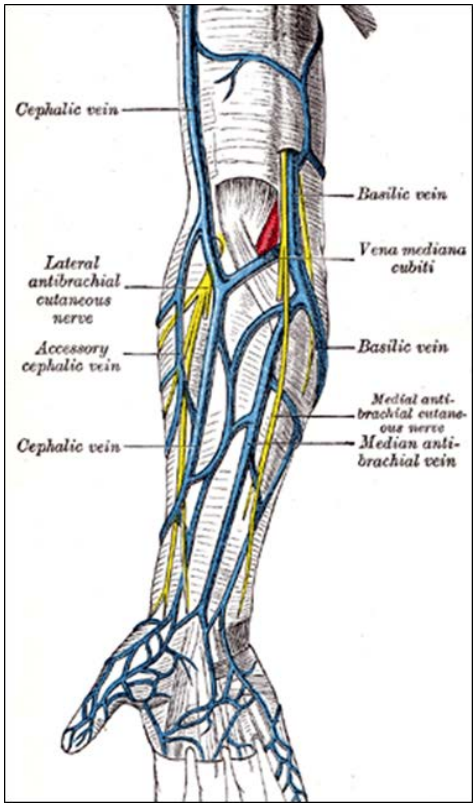
- prevent patients from injuring themselves
- call physician or a nurse immediately

13.4.3. **Puncture Site Selection:**

Although the larger and fuller median cubital veins are used most frequently, wrist and hand veins are also acceptable for venipuncture. In many hospitals, special identification bands indicate restricted use of certain veins for expected IV therapy or insertion of a cannula.

a. Factors in site selection:

- Scarring – avoid healed areas
- Mastectomy – because of lymphostasis, specimens taken from a mastectomy side may not be representative
  - For patients with a double mastectomy (that the patient reveals) – work with the patient to determine the best site possible away from the removed lymph nodes. The hand can be utilized if necessary.
- Hematoma – specimens collected from a hematoma site may cause erroneous results. If site must be used, collect the specimen distal to the hematoma.
- Intravenous therapy – specimens should be collected from the opposite arm. If that is impossible, satisfactory samples may be drawn below the I.V. if the I.V. is turned off fifteen minutes before venipuncture, the tourniquet is applied below the I.V. site, another vein is selected, and 5 ml of blood is drawn and discarded.
  - Patients on IV therapy for extended periods of time often have veins that are palpable and visible but are damaged or occluded (blocked). Every time a catheter is used, vein damage occurs. Circulatory blood is rerouted to collateral veins and can result in hemoconcentration
- Cannula, Fistulas, Vascular Graft – consult physician. Do not attempt to draw from these sites.
- Chemotherapy – use opposite arm of fingerstick because of possibility of extravasation.
- Edema - Some patients develop an abnormal accumulation of fluid in the intercellular spaces of the body. This swelling can be localized or diffused over a larger area of the body. The phlebotomist should avoid collecting blood from these sites because veins are difficult to palpate or stick and the specimen may be contaminated with fluid.
- Obesity - Obese patients generally have veins that are difficult to visualize and palpate. If the vein is missed, the phlebotomist must be careful not to probe excessively with the needle because it cause rupture of RBC's, increase concentration of intracellular contents, and releases some tissue clotting factors.
- Avoid arteries (more elastic with thick walls and pulsate)
- Avoid thrombosed veins (lack resilience, roll easily and feel cord-like)
- ***Drawing lower extremities: laboratory personnel are not permitted to draw from the patient's foot /lower extremities***.



13.5. **Patient Preparation & vein location:** Verify patient identification. Explain the procedure to the patient in a reassuring manner. Have the patient relax in a comfortable position, lying in bed or seated in a comfortable chair. Verify patient's diet restrictions, some tests require the patient to fast and/or eliminate certain foods from the diet prior to the specimen collection.

13.5.1. A tourniquet may be used to aid in the selection of a vein site unless specific tests require tourniquets not be used (e.g., lactate). If a tourniquet must be applied for the preliminary vein selection, it should be released and reapplied after two minutes.

13.5.2. Palpate and trace the path of veins several times with the index finger

13.5.3. If a vein is not apparent, tap the vein site with the index and second finger or apply a warm water bottle for five minutes.

13.5.4. Wash hands & put on gloves.

- Wash with soap and water if visibly dirty, contaminated with proteinaceous material, or soiled with blood or other body fluids.
- If not visibly soiled, an alcohol-based hand rub can be used for decontaminating hands.

13.5.5. Clean venipuncture site with alcohol in a circular motion from the center to the periphery. Allow the area to dry to prevent hemolysis and to prevent the patient from having a burning sensation.

13.5.6. Apply the tourniquet (if patient has skin problem, apply over clothing) around the arm 3 to 4 inches above the venipuncture site. Tuck the end under the last round. If a Velcro tourniquet is used, stick the tabs to each other. Do not leave on for longer than two minutes.

13.5.7. Ensure the patient's hand is closed.

- There must not be vigorous hand exercise ("pumping"). Vigorous hand exercise can cause changes in the concentration of certain analytes in the blood.

13.5.8. Begin the venipuncture by holding the patient's arm and anchoring the vein with your thumb or between index finger and thumb.
13.5.9. Verify the needle is secure in the holder, there are no hooks on the needlepoint, and if using a syringe, that the plunger moves freely. Insert collection tube into the holder up to the guideline.
13.5.10. With the bevel up, insert the needle into the vein at an angle of 30 degrees or less and pop the tube
13.5.11. If a blood sample cannot be obtained, change the position of the needle. If the needle has penetrated too far, pull back or advance it if it has not penetrated far enough. Another tube can be used in case the vacuum was insufficient. The tourniquet may be loosened to return blood flow. Probing is not recommended as it is painful and may cause a hematoma. Do not stick a patient more than twice. Contact another staff member for assistance.
13.5.12. Grasping the flange of the holder, push the tube until the stopper is punctured. Keep the tube below the site so fluid does not move back and forth and cause back flow of blood into the venous system.
13.5.13. Release the tourniquet as soon as possible after the blood begins to flow.
13.5.14. Fill the tube until the blood ceases. Remove the tube and repeat for additional specimens. If the tube has an additive, invert gently five to ten times immediately after removing from the vacuum tube holder.
13.5.15. When blood draw is complete open the patient's hand. Place gauze over the site. Apply light pressure to the gauze as the needle is removed and activate the safety feature of the drawing device
13.5.16. Release the pressure to the puncture site and observe to ensure that any subcutaneous bleeding is detected.
13.5.17. Ensure that bleeding has completely stopped & observe collection site for signs of hematoma. Apply an adhesive or gauze bandage over the venipuncture site. It is recommended that hypoallergenic adhesives be available. Tell the patient to leave the bandage on for at least 15 minutes.
13.5.18. Continued bleeding:
- If bleeding persists longer than 5 minutes, a nurse should be alerted so that the attending physician can be notified.
- Pressure applied with gauze must continue at the site as long as necessary to stop the bleeding.

13.5.19. If a syringe was used, activate the safety feature of the needle and using a safety transfer device, fill appropriate tubes.
a. Puncture stoppers and let fill.
b. Do not remove caps and never force blood into a tube.

13.6. At the patient's side, immediately label collection tube(s) with the patient collection labels (full first & last name, identification number) collect date, collect time as needed, and identification of person collecting the specimen.
13.7. Place specimens in transport bag, put requisition in outer pocket.
13.8. Remove gloves, wash hands.
13.8.1. Wash with soap and water if visibly dirty, contaminated with proteinaceous material, or soiled with blood or other body fluids.
13.8.2. If not visibly soiled, an alcohol-based hand rub can be used for decontaminating hands.
13.9. Transport specimens to laboratory.

14. COLLECTION OF BLOOD CULTURE SPECIMENS (Also refer to Collection of Blood Specimens by Venipuncture)

14.1. Proper collection of venous blood for blood culture testing is essential to provide accurate patient test results. To avoid interferences in laboratory methods, meticulous site preparation is paramount to accurate blood culture test results.

14.2. Equipment:
14.2.1. Blood Culture Kit: contains culture bottles

14.2.2. 5 alcohol preps
14.2.3. ChloraPrep Frepp®
14.2.4. Vacutainer ☐ tube holder
14.2.5. Adapter multi sample Leur loc tip (Vacutainer ☐ needle)
14.2.6. 21 gauge Butterfly needle
14.2.7. Gloves
14.2.8. Tourniquet
14.2.9. Gauze pads or cotton balls (should be used on patients with dermatitis)
14.2.10. Dermal tape

14.3. Follow patient preparation and vein selection in section 12.5.

NOTE: INTACT AND CLEAN GLOVES MUST BE WORN DURING THE ENTIRE VENIPUNCTURE PROCEDURE

14.4. **Blood cultures require additional venipuncture site cleaning and prep:**
14.4.1. Clean venipuncture site using 2-3 alcohol preps in a circular motion from the center to the periphery. Use friction to remove skin oils and bacteria & allow the area to dry.
14.4.2. Tear CloraPrep swab package at marks and pull of the bottom part of the packet. Hold stem with top of packet. Start at venipuncture site and using friction paint a gradually enlarging 3-inch circle. Let dry. Do not touch site again.
14.4.3. Assemble Vacutainer and Butterfly device. Set blood culture bottles on flat surface and find fill line. Flip off caps and clean each rubber top with alcohol prep and leave prep on top of bottle until ready to use and do not touch**.**
14.4.4. Perform venipuncture without touching insertion site.
14.4.5. Place Vacutainer holder over top of Aerobic blood culture bottle while holding bottle upright. Monitor for blood flow only to fill line and remove bottle. Repeat with Anaerobic bottle. Gently invert bottles to mix contents**.**
14.4.6. Continue with blood draw for other tubes if needed. Release tourniquet when last tube is placed. Remove last tube after filling, remove butterfly needle, activate safety feature on butterfly needle and dispose of in sharps. Apply light pressure to venipuncture site with gauze.
14.4.7. Wipe off ChloraPrep with alcohol prep. Apply tape or Band-Aid to site.
14.4.8. Label culture bottles and other tubes drawn

14.5. Repeat above procedure at second peripheral site preferably 30 minutes post collection time of the first set of blood cultures.
14.5.1. Label culture bottles:
a. Do not cover bar code on the bottles with patient label
b. Indicate collect date and time, and collector's initials on bottle.
c. Specify anatomical site from which specimen was drawn on bottles and request form
d. Place specimens in transport bag.
- Use a separate bag for bottles from separate sites.

e. Place requisition form in outer pocket.
f. Transport to laboratory within 1 hour.
g. **Do not refrigerate blood culture bottles.**

15. COLLECTION OF SPECIMENS FROM INDWELLING LINES, HEPARIN OR SALINE LOCKS, VASCULAR ACCESS DEVICES (VADs): * Laboratory personnel are not permitted to draw from indwelling lines or VADs.** Obtaining specimens from indwelling lines or VAD's can be a potential source of test error due to hemolysis and incomplete flushing of the collection site. An adequate amount of blood must be withdrawn from the line and discarded before drawing a specimen to ensure the actual specimen is not diluted or contaminated with the flush solution. Discard volume is dependent on the dead-space volume of a particular line. Discarding 2-times the dead-space volume is recommended for non-coagulation testing, and 5 mL or 6-times the dead-space volume for coagulation tests**.**

15.1. Coagulation specimens must have the proper whole blood: anticoagulant ratio. Tubes not containing the specified volume of blood are not acceptable because spurious results would be obtained (the necessary sample volume is listed on the collection tube package).

15.2. Collection of blood for coagulation testing through intravenous lines that have been previously flushed with heparin should be avoided, if possible. When obtaining specimens from indwelling lines that may be contain heparin, the first 5 mL of blood or 6-times the line volume (dead space volume of the catheter) should be drawn off and discarded before the coagulation tube is filled.

16. COLLECTION OF ARTERIAL BLOOD SPECIMENS: Arterial blood collection is collected only by trained respiratory therapy staff.

16.1. **Hazards of Arterial Puncture:**

16.1.1. Vasovagal response: Patients can have a vasovagal reaction, which may result in a loss of consciousness. The procedure for dealing with a patient who has fainted or is unexpectedly non-responsive is to:

a. Notify the designated first-aid-trained personnel.
b. Where practical, lay the patient flat or lower his/her head and arms, if the patient is sitting.
c. Loosen tight clothing.

16.1.2. Arteriospasm: a reflex constriction of the artery in response to pain or other stimuli. This is a transient condition, which may make it impossible to obtain blood, even though the needle is properly located in the lumen of the vessel. It may also result in impaired oxygen flow to the tissue being supplied by the artery.

16.1.3. Hematoma: due to higher pressure in the arteries, more blood is apt to leak through the puncture site. Though the elastic tissue in the arterial wall tends to cause rapid closure of the puncture, elastic tissue decreases with age and certain disease states, therefore the potential for hematoma is greater in older people. Use of larger diameter needles increases the probability of blood leakage. Also the risk of hematoma is increased in patients receiving anticoagulant therapy or individuals with serious coagulopathies (i.e. end stage liver disease or oncology patients).

16.1.4. Thrombosis and embolism: are more likely to occur if a needle or cannula is left in place for some time. An adherent clot forms if the inner wall of the vessel in injured. The thrombus grows gradually and may obstruct the entire lumen of the vessel and needle. Thrombi may occur in both arteries and veins, but have more serious consequences in arteries since most superficial veins have collateral vessels assuring adequate circulation. Some arteries do not have collateral vessels. The presence or absence of collateral vessels determines the safety of the procedure and should be a prime consideration in selecting the site of the arterial puncture.

16.2. **Equipment and Supplies:**

16.2.1. Alcohol wipes
16.2.2. Iodine prep
16.2.3. 23 gauge x 1” needle
16.2.4. 22 gauge x 1 ½ ‘ needle
16.2.5. Blood Gas Collection Kit: 3ml pre-heparinized blood gas syringe
16.2.6. A needle capping device and air bubble removal cap
16.2.7. Sterile gauze pads
16.2.8. Container with ice
16.2.9. Adhesive bandage
16.2.10. Disposable sterile gloves

16.3. **Patient Preparation:**

15.3.1. Verify patient identification using at least two (2) identifiers.

NOTE: Wherever possible, allow the patient's temperature, breathing pattern, and the concentration of oxygen in the inspired air (FiO2) to stabilize for at least 30 minutes. Note the FIO2 concentration on the request form to permit interpretation of the results.

15.3.2. Explain the procedure to the patient in a reassuring manner and have the patient relax in a comfortable position, lying in bed or seated in a comfortable chair, for at least 5 minutes until breathing is stabilized. Blood gas values may be altered by hyperventilation due to anxiety, breath-holding, vomiting or crying

16.4. **Arterial Puncture Site Selection:**

16.4.1. Criteria for selection of the site:

a. Collateral blood flow
b. Accessibility and size of artery
c. Periarterial tissue: fixation of the artery, danger of injury to adjacent tissues

16.4.2. Sites of arterial puncture:

a. Radial artery: the radial artery is easily accessible at the wrist in most patients and is the most commonly used site for arterial puncture. It is easily compressed over the ligaments of the wrist, thus the incidence of hematomas is relatively low. Collateral circulation to the hand is normally provided by the ulnar artery. Inadequate blood supply to the hand may suggest the need to select another puncture site.
b. Brachial artery: the brachial artery is also used for arterial puncture. It may be preferred for larger volumes. It may be more difficult to puncture due to the deeper location between muscles and connective tissue. Proper positioning of the arm with hyperextension improves the position of the brachial artery for puncture. It is not supported by firm fascia or bone, and in obese patients, may be difficult to palpate. Effective compression of the puncture site is more difficult because of the deep location in the soft tissues. The incidence of hematoma formation may be more common than at the radial site. The brachial artery is not commonly used in infants or children. It is harder to palpate than the radial artery and there is no collateral circulation.
c. Femoral artery: the femoral artery is a large vessel that is superficially located in the groin and easily palpated and punctured. Generally, this is the last site selected. Disadvantages are poor collateral circulation to the leg and increased chance of infection if the site is not thoroughly cleansed. In newborns, the hip joint and femoral vein and nerve lie so close that injury to these structures is a hazard, which may contraindicate this procedure. Puncture of the femoral artery in older infants and children is relatively easy and safe.
d. Scalp arteries: in infants scalp arteries may be as wide as or wider than the radial artery and may be punctured easily. One of the two main branches of the temporal artery is usually used.

16.4.3. Modified Allen Test: to be performed if **the radial artery** is chosen as the puncture site

a. Instruct the patient to close hand to form a fist
b. Apply pressure at the wrist, compressing and obstructing both the radial and ulnar arteries.
c. Instruct the patient to open hand to reveal blanched palm and fingers.
d. Release obstructing pressure from the ulnar artery and observe palm and fingers. They should become flushed within 15 seconds. If the ulnar artery does not adequately supply the entire hand (a negative Allen test), the radial artery should not be used.

16.4.4. Gather all required equipment and supplies.
16.4.5. Select puncture site.
16.4.6. Position patient for access to and locate selected artery:

a. Radial artery: The arm should be abducted with palm facing up and wrist extended about 30 degrees to stretch and fix the soft tissues over the firm ligaments and bone. If necessary, use a rolled towel or pad for positioning of the extremity. Locate the artery just proximal to the skin crease at the wrist.
b. Brachial artery: The arm should be extended and wrist rotated until the maximum pulse is palpated with the index finger just above the skin crease in the antecubital fossa. If necessary, use a rolled towel or pad for positioning of the extremity. Follow the arterial pulse proximally by palpation with the middle finger for 2-3 cm.

c. Femoral artery: The patient should lie flat with both legs extended. Palpate the pulsating vessel with 2 fingers.

16.4.7. Prepare the puncture site aseptically. Do not touch the puncture site after cleansing except with gloved fingers. Shave the area around the puncture site for femoral or scalp artery puncture.

16.4.8. Perform Puncture:

a. Radial or Scalp artery:
- Hold syringe like a dart with the bevel of the needle up at an angle of 30 to 45 degrees and puncture skin about 5-10 mm distal to the exact point where needle should enter artery
- Advance the needle under the skin aiming for artery. When the artery is entered, blood will enter the flashback chamber.

b. Brachial artery:
- Spread 2 fingers along the course of the artery
- Enter the skin just below the distal finger and aim the needle along a line connecting the 2 fingers, using a 45-degree angle of insertion with the bevel up.

c. Femoral artery:
- Spread 2 fingers 2-3 cm apart along the course of the artery to anchor the vessel
- Puncture the skin perpendicular to the surface, at an angle against the blood stream between the 2 fingers.

d. Quickly remove syringe and simultaneously place a dry gauze sponge over the puncture site.
e. Compress the artery for a minimum of 5 minutes or longer if required to, stop bleeding.
f. While applying pressure to the artery, check the syringe for air bubbles and carefully expel any trapped bubbles.
g. Remove needle and apply stopcock cover.
h. At the patient's side, immediately label syringe with the patient's full first & last name, identification number, collect date, collect time, and identification of person collecting the specimen
i. Place specimen in transport bag and immerse in ice bath.
j. All Critical Care Batteries (CRITB) must have the actual collect time indicated on the lab label.
k. Deliver to laboratory within 10 minutes of collection for analysis.

17. COLLECTION OF BLOOD SPECIMENS BY CAPILLARY SKIN PUNCTURE: Proper collection of capillary puncture specimens is essential for accurate laboratory test results. Skin-puncture is a mixture of blood from arterioles, venules, capillaries, and interstitial fluids. The proportion of arterial blood is greater than venous blood because pressure in the arterioles leading into the capillaries is greater than pressure in the venules exiting the capillaries.

17.1. Hazards of Capillary Puncture:

17.1.1. Fainting
a. if patient is sitting, lower their head and arms
b. loosen tight clothing
c. apply cold compresses to the forehead and back of neck.
d. notify nurse or physician immediately

17.1.2. Nausea
a. make patient comfortable
b. instruct patient to breathe deeply and slowly
c. apply cold compresses to forehead
d. notify nurse or physician immediately

17.1.3. Vomiting
a. give patient an emesis basin and tissues
b. have water for patient to rinse their mouth
c. notify nurse or physician immediately

17.1.4. Convulsions

a. prevent patients from injuring themselves
b. call physician or a nurse immediately

17.2. Patient Preparation:
17.2.1. Position the patient
17.2.2. Seat the patient in a chair with arms to prevent falls if the patient loses consciousness. Have the patient place arm on the armrest.
a. Use a bed, cot or reclining chair as appropriate.

17.3. Site Selection:
17.3.1. Skin puncture blood can be obtained from the palmar surface of the finger's distal phalanx and lateral or medial plantar surface of the heel. In infants less than 1 year old, heel puncture is generally performed. For older children and adults, the palmar surface of the finger's distal phalanx in most frequently used.
17.3.2. Blood should not be collected from the central area of an infants heel, fingers of a newborn less than 1 year old, a swollen or previously punctured site (because accumulated tissue fluid will contaminate the blood specimen), or fingers on the side affected by a mastectomy.
17.3.3. Infants, Heel: The site must be on the plantar surface medial to a line drawn from the middle of the big toe to the heel or from the fourth or fifth toe to the heel. Skin puncture must not be performed on the central area of the foot. This may cause injury to the nerves, tendon, or cartilage.
17.3.4. Adults, Finger: The puncture must be on the palmar surface of the distal phalanx (not at the side or tip of the finger) because the tissue on the side and tip of the finger is about half as thick as the tissue in the center of the finger. The puncture should occur across the fingerprints, not parallel to them. Middle and ring finger are preferred sites because the thumb has a pulse and the index finger may be more sensitive or callused. The fifth finger must not be punctured, because the tissue depth is insufficient to prevent bone injury. Finger stick puncture must not be performed on infants.

17.4. REAGENTS/SUPPLIES:
17.4.1. 70% Isopropyl Alcohol wipes
17.4.2. Retractable Skin-puncture device
17.4.3. Warming device
17.4.4. Gloves
17.4.5. Cotton balls or gauze wipes
17.4.6. Collection container(s)
17.4.7. Band-Aids

18. GENERAL GUIDE FOR URINE COLLECTION:

18.1. Midstream, Clean-catch Urine, Single Specimen Collection Procedure

18.1.1. Urine specimens, except those obtained by catheterization or suprapubic aspiration, are collected by the patient. Patients should be instructed on how to collect urine via mid-stream clean catch to minimize contamination by vaginal secretions, skin flakes, smegma, pubic hair, powders, oils, lotions and other extraneous materials. Specimens are not to be recovered from diapers.

18.1.2. **Equipment:**
a. Urine Collection and Transport Kit, includes:
- A 4.5 oz screw-cap sterile specimen cup with integrated sampling device
- Sterile gray top tube with lyophilized maintenance formula for microbiology, 5 mL draw
- Cleansing towelettes

b. Yellow top, plastic conical 8 cc container for urinalysis
c. Specimen Transport bags

18.1.3. **Patient Instructions:**

a. Emphasize hand-washing and general cleanliness when instructing patients.
b. Give the patient a properly labeled specimen container from the Urine Collection and Transport Kit.
c. Give verbal explanation and also the written instructions from the collection kit regarding mid-stream clean catch urine collections.
d. Instruct the patient to secure the lid of the specimen container after collection to prevent leakage.

18.1.4. **Collection Procedure: (patient)**

a. Open bag and remove cup and towelettes.
b. Unscrew cap of the cup. Place cap on counter with "straw" facing upward. **Do not touch the inside of cup, cap, or straw.**
c. Cleanse with towelettes as follows:
- Male:
  - If not circumcised: hold foreskin back before cleansing
  - Wipe head of penis in a single motion with the first towelette
  - Repeat with second towelette
  - Urinate a small amount into toilet or bedpan
  - Patient Education_Clean Catch Male
- Female:
  - Separate the labia
  - Wipe inner labial folds from front to back with a single motion with the first towelette
  - Wipe down through center of labial folds with second towelette
  - Keep labia separated and urinate a small amount into the toilet or bedpan
  - Patient Education_Clean Catch Female

d. Place cup under stream and continue to urinate into cup and collect specimen.
e. Finish voiding into toilet or bedpan.
f. Replace cap on cup. Tighten cap securely. **Caution: sharp needle under cap label. Do not remove label from cap.**

18.1.5. **Specimen Transfer:**

a. Transfer urine to secondary container(s):
- Place rubber cap of secondary container onto the sampling needle and puncture. The secondary container will fill automatically.
- Repeat for second container if necessary.
- Label secondary container(s) with full patient name and medical record (identification) number.

b. Place secondary container in specimen transport bag, 1 container per bag.
- Place requisition form in outer pocket.
- Microbiology request: gray top tube
- Other urine analysis: yellow top conical tube

c. Transport to laboratory within 1 hour of collection. If the specimen cannot be transported immediately, refrigerate at 2 - 8 degrees C after collection.

18.2. **Urine, Random Specimen Collection Procedure (NOT the preferred sample for culture)**

18.2.1. Unscrew cap of the cup. Place cap on counter.
18.2.2. Place cup under stream and continue to urinate into cup and collect specimen.
18.2.3. Finish voiding into toilet or bedpan.
18.2.4. Replace cap on cup. Tighten cap securely.
18.2.5. Transfer to 8 cc yellow top urine tube.
18.2.6. Label with full patient name and medical record (identification) number.

18.2.7. Place secondary container in specimen transport bag, 1 container per bag.
18.2.8. Place requisition form in outer pocket.
18.2.9. Transport to laboratory within 1 hour of collection. If the specimen cannot be transported immediately, refrigerate at 2 - 8 degrees C after collection.

18.3. **Urine, 24 hour Collection Procedure: *** Some 24 hour urine testing requires the addition of a preservative, if in doubt always consult with the laboratory prior to having the patient start collection.**

18.3.1. Obtain appropriate preservative and place into the 24-hr urine container labeled with the patient's full name and medical record number. Affix hazardous material warning label to the container and communication precautions to the patient. Repeat if additional containers are required.

a. Acetic acid: Use pre-measured aliquot (25 mL) per 24-hour urine collection (add solution to container at beginning of collection).
b. Fresh Only or No Preservative required, refrigerate during collection period unless otherwise noted.

18.3.2. **Collection Procedure:**

a. Have patient void and empty bladder. Discard this urine and note the time on the container.
b. Save all urine voided during the next 24 hours in the designated container.
c. At the end of the 24 hours have the patient void and add this urine to the container.
d. Send the sample to lab with the appropriate requisition, properly filled out.

Patient Education_24 hour urine collection sheet

19. COLLECTION OF SPECIMENS FOR MICROBIOLOGY CULTURE

19.1. Proper collection of specimens for microbiology culture is essential to provide accurate patient test results. To avoid interferences in laboratory methods, it is imperative that the correct procedure for collection and handling of specimens be followed. Meticulous site preparation is paramount to accurate culture results.

19.2. **General Considerations:**

19.2.1. Verify patient identification using at least 2 identifiers.

a. Patients with an identification bracelet: double-check name and medical record number
- If the patient is able, verify the patient's identity by asking them to state their name. Compare with name on identification bracelet.
- Match the patient name and medical record number on the identification bracelet with the tube labels or request form

b. Patients with **no** identification bracelet: match verbal information to request form or tube labels
- Verify the patient's identity by asking them to repeat their name and date of birth. OR
- If patient is unconscious, mentally incompetent or does not speak the language, verify identity with a nurse or family member

19.2.2. Obtain specimens prior to administration of antimicrobial therapy whenever possible.
19.2.3. Indicate antibiotic(s) administered on the laboratory requisition form.
19.2.4. Collect specimens in appropriate sterile leak-proof container, adequate for placement as well as removal of the specimen. Refer also the individual Test Listings for specimen requirements.

19.2.5. Close container securely to prevent leaking. Label container with full patient name and medical information number. Place container in transport bag and seal. **Leaking specimens are not acceptable**.
19.2.6. Indicate exact site of specimen, collect date and collect time on requisition form.
19.2.7. Transport to the laboratory immediately.

19.3. **Specimens for Anaerobic Culture:**

19.3.1. Generally, specimens for anaerobic culture should be obtained by closed puncture aspiration into a sealed container under strict aseptic conditions. Do not submit needles to the laboratory. Transfer aspirates from needle and syringe into a sterile tight-sealing container. Soft tissue infections may be cultured by injections of 1 to 2 mL of sterile saline into the infected site with withdrawal of the saline and tissue juice into the syringe that is immediately injected into a sealed container. Tissue biopsies collected surgically are also acceptable.
19.3.2. Collection of anaerobic specimens with swabs is highly discouraged, due to the small volume of specimen collected and the tendency to swab surface sites that contain normal anaerobic flora. If a swab must be used, it must be a swab specifically designed for anaerobic transport, such as the Port-A-Cul tube. Aerobic swabs such as the BD red cap dual-swab culturette are not acceptable for anaerobic culture
19.3.3. Decontamination of abscess and wound surfaces should be performed by washing area with povidone iodine or similar antiseptic that is allowed to remain on the skin for at least one minute.
19.3.4. Refer to the table below for appropriate sites for anaerobic culture. Sites that involve contamination with normal anaerobic flora are rejected for anaerobic culture by the laboratory.
19.3.5. Specimens for anaerobic culture should be maintained at room temperature and be received in the laboratory within 30 minutes of collection. If an anaerobic transport media is used, specimen should be received in the laboratory within 2 hours of collection.

Table: Appropriate Anaerobic Culture Sites and Methods

Site	Acceptable Specimens	Method	Unacceptable Specimens
Head and Neck	Abscess or Biopsy Material	Decontaminate abscess surface and aspirate contents with needle and syringe. Biopsy specimens should be surgically collected. Remove needle before submitting to laboratory	Throat or nasopharyngeal swabs. Gingival swabs Superficial material collected with swabs.
Respiratory Tract	Transtracheal aspirate Material from percutaneous lung puncture Biopsy material surgically obtained Bronchoscopic materials obtained by protected brush Thoracotomy specimen Pleural fluid Sinus aspirates		Sputum, throat, or nasal swabs Endotracheal aspirate Bronchoscopic specimens not specially collected Sinus washings or swabs
Central Nervous	Abscess aspirate		CSF from lumbar puncture

System	Biopsy material surgically obtained CSF from indwelling shunt		
Abdomen/GI Tract	Peritoneal fluid Abscess aspirate Bile Biopsy material surgically obtained	Aspirate with syringe and needle. Remove needle before submitting to laboratory	Stool Surface swabs from mucous membranes Intestinal contents Anal/rectal abscess
Urinary Tract	Suprapubic aspirate Biopsy material surgically obtained		Clean catch or catheterized urine. Nephrostomy urine.
Female genital tract	Culdoscopy specimens Endometrial aspirate Abscess aspirate Biopsy material surgically obtained IUD for Actinomyces Screen	Endometrial aspirates should be obtained by suction or protected catheter.	Vaginal, cervical, genital surface swabs
Bones and Joints	Aspirates or biopsies surgically obtained		Superficial material collected with swabs
Soft Tissue	Aspirates Biopsy material surgically obtained Aspirate from sinus tract Deep aspirate of open wound margin Deep aspirate of surface ulcer	Aspirates are obtained by syringe and needle. Remove needle before submitting to laboratory Sinus tract -Syringe aspiration using small plastic catheter threaded into infected site. Wound and ulcer surfaces should be decontaminated.	Superficial material collected from skin surface or edges of wound

19.4. **Body Cavity Fluids:**

19.4.1. Preferred Specimens:

Aseptically obtained aspirate is the preferred specimen.

19.5. **Eye Specimens:**

19.5.1. Preferred Specimens:

a. Conjunctivitis:

- Sterile swab with sterile saline or broth is touched to involved area and directly inoculated onto appropriate plates. If viral or chlamydial infection suspected, place swab in viral transport media.
- Scrape conjunctiva with sterile metal spatula and prepare thinly spread on dried smears.

b. Corneal infections:

- Culture conjunctiva as above
- Anesthetize cornea with 0.5% proparacaine hydrochloride
- Under slit lamp control scrape base and margin of ulcer. Use scrapings to prepare slides and direct culture of appropriate plates.

19.6. **Genitalia Specimens:**

19.6.1. Special Patient Preparation:

- Genital cultures in females should be obtained via speculum under direct observation.

19.6.2. Preferred Specimens:

See individual cultures in Test Listing
Routine bacterial cultures of vagina, vulva, or cervix surface or drainage are not performed. The following testing is available based on the suspected infectious organism or clinical presentation.

Table: Microbiology orders for Vaginal/Cervical/Vulva specimens

Organism suspected	Order	comments
Yeast/*Candida*	Screening culture, Yeast or Vaginitis DNA Probe test	DNA probe requires specific AFFIRM tube collection
Group B Streptococcus	Beta Strep vaginal screening by PCR	For prenatal screening, should be rectal/vaginal swab combination
Swab of **Wound/Lesion/Ulcer/Abscess** on vaginal wall, vulva, labia, or cervix	Genital culture Anaerobe culture (if indicated)	Specify wound/lesion/abscess in IHIS specimen site field. Anaerobes are appropriate from an abscess or surgically collected tissue from these areas
Listeria	Genital Culture	Specify suspected organism in IHIS comment field or on requisition
Chlamydia trachomatis or *Neisseria gonorrhoeae*	Chlamydia/N gonorrhoeae amplified (PCR test) Neisseria screening culture. Chlamydia culture	The amplified test is much more sensitive than culture. Collect from cervix, urethra, or urine for the amplified test. Submit the appropriate Aptima tube depending on source for the amplified test. For Neisseria culture, collect from endocervix, urethra, or rectum.

		For chlamydia culture, submit in viral transport tube.
Gardnerella	Vaginitis DNA Probe test	test requires specific AFFIRM tube collection
Trichomonas	Vaginitis DNA Probe test	test requires specific AFFIRM tube collection
Vaginosis/vaginitis	Vaginitis DNA Probe test	Culture is not an acceptable method to diagnose bacterial vaginosis
Organism suspected	**Order**	**comments**
Herpes simplex	Herpes simplex PCR	Submit swab in Viral Universal Transport Media
Haemophilus ducreyi/Chancroid or Syphilis lesion	Order a sendout test in IHIS.	Specimen is sent to the CDC. Notify the send out lab at 293-8375. Specify suspected organism in IHIS comment field or on requisition
Human Papilloma virus (HPV)	HPV High Risk probe	Use Cytology Sure Path or Thin Prep collection vial
Toxic Shock Syndrome	Genital culture is not appropriate	Call microbiology lab at 293-8676 if guidance is needed
Other organism		Call microbiology lab at 293-8676 if guidance is needed

19.7. **MRSA Screen Anterior Nares, PCR: BMTU Only**

19.7.1. Collect anterior nares swab specimens with BBL/Copan™ Dual Culture Swab and Transport System (red cap swab) only.

19.7.2. Prepare swabs

a. Open the swab collection device wrapper and remove the clear plastic transport tube cap.

b. Leave the red capped paired swabs and transport tube in the open wrapper.
Note: leave the swabs attached to the red cap at all times.

19.7.3. Specimen Collection

a. Instruct the patient to tilt his/her head back and insert the paired swabs together approximately 1-2 cm into a nostril, rotating the swabs against the inside of the nostril for 3 seconds (slight pressure with a finger on the outside of the nose helps to assure good contact with the swab).

b. Using the same swabs, repeat the procedure in the second nostril.

c. Place the swabs into the transport tube. Make sure the swabs go all the way to the bottom of the tube where they rest on the sponge. Make sure the red cap is closed tightly.

d. Label swab container with 2 patient identifiers and send to the Microbiology Lab.

19.8. **Specimens for Mycobacteria Culture:**

19.8.1. Special Patient Preparation: Specimens should be collected before initiation of therapy since even a few days treatment may render the culture negative.

19.8.2. Sputum: the patient should be instructed to cough deeply and expectorate sputum into proper container. If the patient is unable to produce sputum, sputum induction may be effected by postural drainage, saline nebulization, or chest percussion.

19.8.3. Gastric lavage: since the objective of gastric lavage is to obtain swallowed sputum, the specimen should be obtained at least eight hours after the patient has eaten or taken oral drugs. An early morning sample is preferable.

19.8.4. Preferred Specimen:

a. Sputum: 10 cc first morning sputum or induced sputum. Collect 3 specimens, at 8-24 hour intervals (24 hours when possible) with at least one first-morning sample. 24-hour sputum collections are not recommended.

b. Urine: Three consecutive clean voided early morning specimens. 24-hour urine collections are not recommended.

c. Skin: In the case of suspected mycobacterial infections, tissue is the recommended specimen.

d. Refrigerate all specimens if transport will be delayed.

19.9. **Nasopharynx Specimens:**

19.9.1. Preferred Specimen:
Nasopharyngeal swab comprising a malleable wire with Teflon, calcium alginate (or equivalent) coated nontoxic tip inserted through nose into nasopharynx. The swab should be rotated gently and maintained in the nasopharynx for at least 15 seconds. The swab should be inserted into the appropriate transport medium for test requested and submitted to the laboratory as soon as possible. Appropriate transport media include universal transport media for viral testing, culturette swab, and pertussis swab systems

19.10. **Skin Specimens:**

19.10.1. Special Patient Preparation: The area must be disinfected as for a blood culture. Iodine must be thoroughly removed. In absence of lesions that can be cultured readily, these specimens may be of no help.

19.10.2. Preferred Specimen:

a. Aspirate or pus from bullae, vesicles, and abscesses
b. Material from interior of lesions is preferred over surface material
c. Scrapings or hair, or nail clippings for dermatophytes.
d. Swabs are of limited value.
e. In case of suspected mycobacterial infection, tissue is the recommended specimen.

19.11. **Sputum Specimens:**

19.11.1. Special Patient Preparation: The patient should be instructed to cough deeply and expectorate sputum into proper container. If the patient is unable to produce sputum, sputum induction may be effected by postural drainage, saline nebulization, or chest percussion.

19.11.2. Preferred Specimen: A single 2 mL minimum of early morning freshly expectorated sputum is preferred.

19.12. **Stool Specimens:**

19.12.1. Special Patient Preparation: Avoid antibiotic administration prior to taking specimens.

19.12.2. Preferred Specimen:

Test	Collection container	Special requirements
Stool culture	3-tube kit preferred, or stool in sterile container, or 2 rectal swabs (pediatric only)	No more than 2 samples per patient should be submitted for culture. Collect at least a day apart. If patient has been hospitalized for more than 3 days and develops diarrhea, consult with Microbiology lab director before submitting specimens for stool culture.
Shigatoxin	3-tube kit preferred, or stool in sterile container, or a rectal swab	Refrigerate if unable to deliver to lab within 1 hour.
Comprehensive Ova and Parasite Exam. Parasite Screen	3-tube kit preferred, or stool in sterile container	Specimen is sent to Mayo Medical Laboratories for testing. Comprehensive ova and parasite exams should only be ordered on patients with a travel history to a developing country, in immunocompromised status, or if a parasite other than *Giardia*, *Cryptosporidium* or *E histolytica* is suspected. List in order entry which of these conditions applies, and if a parasite is suspected please name it. No more than 2-3 specimens should be submitted for comprehensive exam, collected at least a day apart.

		Send one specimen initially for parasite screen, however if the patient remains symptomatic a second sample may be sent. If patient has been hospitalized for more than 4 days and develops diarrhea, consult with Microbiology lab director before submitting specimens for parasite exams. If *Microsporidium* is suspected, inform lab, as this is a separate, referred test.
Test	**Collection container**	**Special requirements**
C. difficile toxin by PCR	3-tube kit preferred, or stool in sterile container	Submit only one unformed or watery stool specimen. Refrigerate if unable to deliver to lab within 8 hours. Do not send another sample during that diarrheal episode, or for at least 3 days. If initial test is positive, subsequent samples submitted within 7 days will be rejected. Formed stool will be rejected.
Pinworm preparation	Special collection kit (SWUBE) available from lab	Do not send stool. If SWUBE is unavailable, submit CLEAR scotch tape on a sterile slide. Opaque tape will be rejected.
Fecal fat	3-tube kit or stool in sterile container	Specimen is sent to Mayo Medical Laboratories for testing.
Macroscopic parasite exam	Sterile container	Submit worm or worm fragment passed from intestine for identification. Should be visible to eye.

19.12.3. Stool can be collected in "hats", bedpans, or sterile wide mouthed containers. It should not be contaminated with urine, toilet paper, or toilet water. Immediately transfer stool to the color coded 3-vial stool transport containers. Add stool to displace liquid to the line indicated on the container. Fill all 3 vials. Tightly close, invert to mix, label specimen containers, and transport in securely sealed specimen transport bag. Leaking specimens are unacceptable. Stool not in preservative must be delivered to the lab within 1 hour of collection.

19.12.4. If transport on ice is required, place ice in a separate transport bag and seal. Then place into the transport bag containing the specimen. Seal the specimen bag. Place the requisition in the outer pocket and send to the lab immediately.

19.13. **Throat Culture Specimen:**

19.13.1. Special Patient Preparation: Avoid antibiotic administration prior to taking specimens.

19.13.2. Preferred Specimen:The preferred specimen is a fresh uncontaminated swab of the posterior pharynx and tonsillar fossa taken under direct visualization with tongue depression to avoid lingual contamination. Any visible exudate should be cultured.

19.14. **Urine Culture Specimen:**

19.14.1. Special Patient Preparation: Avoid antibiotic administration prior to taking specimens.

19.14.2. Preferred Specimen:The preferred specimen is Clean-Catch midstream or catheterized urine submitted in the grey top tube available in the urine collection kit. Leaking specimens are unacceptable. Refer to the *Midstream, Clean-catch Urine, Single Specimen Collection Procedure* for collection instructions. Do **NOT** collect urine from the "hat", bedpan, or Foley catheter bag for culture. Label urine container with patient **full** name and identification number. Specify source (clean catch, catheterized, cystoscopy, suprapubic, etc) on the requisition.

19.15. **Wound Culture Specimens:**

19.15.1. Special Patient Preparation: Avoid antibiotic administration until after specimen is obtained. Disinfect the surrounding area with several changes of sterile saline prior to obtaining specimens. Disinfect surface with antiseptic for anaerobic culture.

19.15.2. Preferred Specimen:The preferred specimen is a discharge or aspirated material after surface is cleaned, disinfected, or removed (e.g., debridement). The specimen should be obtained from the deep or active part of the wound.

a. Exudated tissue is preferable to swab specimens, particularly if mycobacteria, fungi, or anaerobes are suspected.

19.16. **Collection of Specimens for *Neisseria gonorrhea* / *Chlamydia trachomatis* by Amplified Detection**

19.16.1. **Swab specimens must be collected** using an Aptima® Collection Unisex Swab. These swabs are contained in the Aptima® Collection Kit.

19.16.2. **Submit only ONE (1) of the following specimens:**

a. **Endocervix (Females Only)**

- Collect specimen using Aptima® Swab Collection System as follows:
- Use cleaning swab (white shaft) to remove excess mucus from endocervix and then discard.
- Insert second swab (blue shaft) 1 cm to 1.5 cm into endocervical canal, and rotate gently for 30 seconds. Avoid touching vaginal wall when removing swab.
- Place second (blue) swab into transport tube provided in collection kit. Snap off swab at score line so swab fits into closed tube.
- Cap tube securely, and label tube with patient's entire name, MRN and date and time of collection.
- Send specimen at room temperature or refrigerated.

Note: Specimen source is required on request form for processing.

b. **Urethra (Males Only)**

- Collect specimen using Aptima® Swab Collection System as follows:
- Instruct patient not to urinate for 1 hour prior to collection.
- With a rotating movement, insert swab (blue shaft) 2 cm to 4 cm into urethra.
- Once inserted, rotate swab gently at least 1 full rotation using sufficient pressure to ensure swab comes into contact with all urethral surfaces. Allow swab to remain inserted for 2 to 3 seconds.
- Place blue swab in transport tube provided in collection kit. Snap off swab at score line so swab fits into closed tube.
- Cap tube securely, and label tube with patient's entire name, MRN, and date and time of collection.
- Send specimen at room temperature or refrigerated.

Note: Specimen source is required on request form for processing

c. **Urine (Males and Females)**

- Collect specimen using Aptima® Urine Specimen Transport Tube as follows:
- Instruct patient not to urinate for at least 1 hour prior to specimen collection and **not** to clean genital area prior to collection.
- Collect the first portion (approximately 15 mL to 20 mL) of a voided urine (first part of stream--**not midstream**) into a screw-capped, sterile, plastic, preservative-free specimen collection container.
- Transfer about 2 mL of urine into the urine specimen transport tube, using the disposable pipette provided, within 24 hours of collection. The correct volume of urine has been added when the fluid level is between the black fill lines on the urine transport tube. Discard pipette after single patient use.
- Cap tube securely and label with patient entire name, MRN, and date and time of collection. Do not obscure black fill lines on tubes when using adhesive labels.
- Send urine transport tube at room temperature or refrigerated.

Note: Specimen source is required on request form for processing.

NOTE: Aptima® Urine and Swab Transport containers are NOT interchangeable.

19.17. **Collection of Specimens for Tzanck Prep/Direct Examination for Herpes Simplex and/or Varicella Zoster**

19.17.1. Proper collection of specimens is essential to provide accurate patient test results. To avoid interferences in laboratory methods, it is imperative that the correct procedure for collection and handling of specimens be followed. Meticulous site preparation is paramount to accurate culture results.

19.17.2. **General Considerations:**

a. Tzanck preparations can yield a rapid morphologic diagnosis of Herpes Simplex and/or Varicella Zoster infections from skin or mucous membrane lesions by the identification of characteristic viral cytopathic changes in epithelial cells. Both the quality of the specimen and the stage of the lesion sampled influence the sensitivity of this method. Samples obtained from an early vesicular lesion have a sensitivity of 67% with crusted lesions yielding a sensitivity of only 17%.

b. This method is not as sensitive as culture; therefore it is recommended that a viral culture swab (with separate order) also be submitted.

19.17.3. **Procedure:**

a. Obtain collection kit.

b. Verify patient identification using at least 2 identifiers.

- Patients with an identification bracelet: double-check name and medical record number
  - If the patient is able, verify the patient's identity by asking them to state their name. Compare with name on identification bracelet.
  - Match the patient name and medical record number on the identification bracelet with the tube labels or request form
- Patients with no identification bracelet: match verbal information to request form or tube labels
  - Verify the patient's identity by asking them to repeat their name and date of birth. OR
  - If patient is unconscious, mentally incompetent or does not speak the language, verify identity with a nurse or family member

c. Open/un-roof a fresh blister with a scalpel or sterile needle. Use the blunt end of a sterile cotton tipped swab on mucous membranes.

- Crusted and healing lesions are rarely positive unless vigorous effort is made to obtain epithelial cells.
- Exudate, pus, and crust are not appropriate specimens. The diagnostic intranuclear inclusions are only present in epithelial cells.

d. Thinly spread the material onto two (2) glass slides limiting the distribution of the specimen to the area indicated on the slide by a circle.

- Prepare additional slides if a large amount of material is obtained.

e. Label slides with patient name and identification number.

f. Place slides in provided container and return to laboratory.

19.18. **Vaginal Sample Collection for Vaginitis Testing**

19.18.1. Label the Sample Collection Tube (SCT) with the patient identification information. Include the time the sample was collected.

19.18.2. Place the patient in position for a pelvic examination.

a. Insert an UNLUBRICATED speculum (WITHOUT JELLY OR WATER) into the vagina to permit visualization of the posterior vaginal fornix.

b. Using the sterile swab, obtain a sample from the posterior vaginal fornix. Twist or roll the swab against the vaginal walls two or three times, ensuring the entire circumference of the swab has touched the vaginal wall.

c. Swab the lateral vaginal wall while removing the swab.

19.18.3. Immediately place the swab in the Sample Collection Tube.

19.18.4. With the swab touching the BOTTOM of the collection tube, grasp the pre-scored handle of the swab just above the top of the tube and bend until the swab breaks.

19.18.5. When the swab is fully inserted into the collection tube, the score mark on the swab is approximately 1 cm above the top of the collection tube.
19.18.6. Discard the broken handle into an infectious waste container.
19.18.7. Place the cap over the exposed end of the swab and firmly press the cap onto the tube. The cap will "snap" onto the tube when it is properly seated.
19.18.8. Place the capped Sample Collection Tube into the plastic Sample Transport Bag.
19.18.9. Transport the vaginal sample to the processing area as soon as possible following collection.
a. The elapsed time between placing the swab into the Sample Collection Tube and proceeding with sample preparation should be no longer than one (1) h for samples stored at 15 – 30°C, or no longer than four (4) h for samples stored at 2 – 8°C.
b. If it is not possible to proceed with sample preparation within this time frame, the Affirm VPIII Ambient Temperature Transport System must be used (see below).

19.18.10. **Affirm VPIII Ambient Temperature Transport System Collection (ATTS)**

a. Break the ampule inside the ATTS reagent dropper by firmly squeezing the dropper, **one time only,** close to its center with finger and thumb.
NOTE: After the ampule is broken, do not repeatedly squeeze and release dropper as this may cause injury.
b. Invert dropper and dispense all fluid from the dropper into the Sample Collection Tube. Discard dropper.
c. Collect patient sample as described in section 19.18 above (Vaginal Sample Collection).

20. COLLECTION OF FLUIDS

20.1. Specimen types for body fluid analysis include (but not limited to) amniotic fluid, CAPD, cerebral spinal fluid, pericardial fluid, peritoneal fluid, pleural fluid, drainage and synovial fluid.
20.2. Fluid specimens are accepted in sterile tubes from collection kits or other appropriate containers. Black screw top tubes are the preferred collection vial for most fluid specimens for cell counts and fluid chemistries.
20.3. Do not send fluids in syringes (with or without needles attached).
20.4. Do not send fluids in transfusion bags, or IV bottles for Hematology or Chemistry analysis.
20.5. Do not send large volumes of fluid (more than 500 mL). Pour into appropriate containers or contact laboratory for additional instructions/clarification
20.6. Fluid cannot be collected in special tubes that require a needle to extract for cell counts and fluid chemistries. The laboratory is unable to process these.
20.7. Synovial fluids are collected in one green-stopper sodium heparin vacutainer tube and one lavender-stopper potassium EDTA vacutainer tube. If only one of the above tube types is submitted, the specimen is acceptable for fluid analysis.
20.8. Fluid samples are to be tested within sixty minutes after being received in the laboratory. Cells may begin to lyse after this time.
20.9. CSF specimens have priority over all other tests in the laboratory.
20.9.1. CSF tubes are distributed as follows
a. Tube #1 to cytology and/or immunology
b. Tube #2 to chemistry
c. Tube #3 to microbiology
d. Tube #4 to hematology
20.10. Due to the invasiveness of fluid collection, mislabeled/unlabeled fluids will be processed, but only after the following conditions have been met:
20.10.1. The unit is notified of the mislabeled/unlabeled sample.
20.10.2. A physician or nurse signs an *Unacceptable Specimen Form*, taking full responsibility for the proper identification of the specimen.
20.10.3. If a physician or nurse does not label or re-label the specimen and sign the *Unacceptable Specimen Form*, results will be filed as "MISLX" (MISLABELED) or "UNLX" (UNLABELED. The unit must

be notified and all pertinent information must be documented on the *Unacceptable Specimen For*m stating that a proper signature was not obtained from the physician or unit nurse.

21. Meconium Screen Collection for Drug of Abuse Testing

21.1. Specimen type is meconium. Stool samples are not acceptable.

21.2. A minimum of 1.0 g of sample is required.

21.3. Sample should be transferred to plastic container for submission to lab.

21.4. If sample cannot be tested within 8 hours of receipt, store at 2-8 ºC

22. Umbilical Cord Tissue Testing for Drugs of Abuse

22.1. A minimum of 6 inches of umbilical cord is required for testing.

22.2. Umbilical cord sample should be drained of blood, rinsed with saline and transferred into plastic container for submission to the laboratory.

22.3. If sample cannot be tested within 8 hours of receipt, store at 2-8 ºC.

ACCEPTABLE SPECIMENS FOR PATHOLOGY OR CYTOLOGY EXAMINATION

Correct identification of patient specimens is essential for reporting accurate laboratory results. The purpose of this document is to state the standards for identification of specimens and preparation of requisition forms. The Clinical Laboratory Improvement Act (CLIA) outlined in the Federal Register of February 28, 1992 and updated in the January 24, 2003 rule, mandates rules for Patient Test Management.

Requests for Pathology Services:

Pathologic or Cytologic examination will be performed at the written or electronic order of a physician or authorized practitioner. Verbal orders are permitted only in limited situations, according to department of Clinical Laboratories' policy, which requires subsequent written authorization within 5 days.

Specimen Containers:
All specimens must be submitted in a rigid, puncture resistant, sealed container. Slides must be submitted in a plastic container or cardboard slide folder.

All specimens submitted must have accurate, complete, and legible patient identification on *each primary* specimen container. Identification of the specimen must include **both** the patient's full first and last name **and** identification number.

For OSU Health System inpatients: the specimen identification label must be generated from the patient wristband.

ALL patient identification and specimen information must be affixed to the body of the container, not the lid.

The tissue type, site, and orientation must also be specified on each container. If the specimen needs orientation, use sutures to clearly indicate margins, i.e. 1 suture = 12:00, 2 sutures = 3:00. Do not use needles or bent needles for orientation or to affix specimen to another object (such as a tongue depressor). Do not use water-soluble ink. Do not incise the specimen.

Any solution / preservative / fixative in which the specimen is submitted must also be specified on the container and requisition form.

Each slide submitted for examination must be labeled with patient's full name and identification number.
Do not label the outside of the container (folder) with patient identification.

Specimen Requisition:
A written or electronic request form must accompany every specimen and the information on the specimen and requisition must be identical. The requisition form must be **completely legible** and contain **all** of the following information:

- Patient's full first and last name
- Date of Birth
- Gender
- Identification number
- Location
- Attending physician
- Ordering physician (if different from attending) name and **signature required**
- **For non-OSU practitioners:** Practitioner NPI number
- Collection / procedure date and time
- Service(s) requested
- Source of specimen
- Pertinent clinical history
- For **Gynecologic Pap Exam**: last menstrual period, previous Pap Smear and history of hormone therapy
- **Note-for outpatients also**: diagnosis (ICD-10) code for clinical indications for examination request; i.e. signs, symptoms, diagnosis

Per OSUWMC Medical Staff Administrative Policy, requests for pathologic or cytologic examination for outpatients, which do *not* include diagnosis information or ordering practitioner signature, will not be processed until such information is obtained from the ordering practitioner.

The tissue type, site and orientation of the specimen must be indicated on the request form. Indicate the total number of containers submitted on the form. When submitting multiple containers, **designate EACH tissue type collected and the site of collection** (Example: Container A: skin, right forearm; Container B: skin, left upper arm).

For Products of Conception (**POC**) provide a **gestational age** in weeks on the requisition form.

For all cases that are potentially **breast cancer, either primary or metastatic**, the time that the specimen was removed from the patient must be indicated. If the specimen is placed in formalin before delivery to pathology, the time fixation began must be noted, as well.

Pertinent clinical information (i.e. pertinent history, pre-surgical diagnosis) must also be specified on the request form.

The responsibility for labeling a specimen and verifying all information on the requisition is that of the person who collects the specimen.

Specimen Orientation:

1. If the specimen requires orientation, use sutures to clearly indicate margins, i.e. 1 suture = 12:00, 2 sutures = 3:00.

2. Do not use needles / bent needles for orientation or to affix specimens to another object (such as a tongue depressor).

3. Do not incise the specimen.

Specimen Transport:

In accordance with OSHA safety regulations, all primary specimen containers must be leak proof and placed in a secondary leak proof container for transport to the laboratory. Securely self-sealed plastic bags are used for this purpose. Requisition forms are to be placed in the *outer* pocket.

For surgical specimens originating at OSUWMC Main Campus Hospital:
Surgical Pathology - Gross Room Laboratory - Courier Delivery, Telephone, and Hours of Operation:
Delivery: Surgical Pathology Gross Room Laboratory @ OSUWMC Main Campus
E415 Doan Hall
410 West 10th Avenue
Columbus, OH 43210
Telephone: 614/293-4875 (For results, call 614/293-5905)
Hours of Operation: Monday – Friday 6:00AM to 8:00PM
On-call Pathologists are available 24 hours / 7 days. Contact the Surgical Pathology Resident at pager 293-PAGE ext 9870.

Mailing Address (overnight deliveries):
The OSU Medical Center
Surgical Pathology Gross Room
E415 Doan Hall
410 West 10th Avenue
Columbus, OH 43210

For surgical specimens originating at OSUWMC East Campus Hospital:
Delivery: UHE Pathology Laboratory,
3rd Floor, North Wing, Rm N329,
1492 E. Broad St.
Columbus Ohio 43205
Telephone: 614-257-3980
Processing lab operation: Monday-Friday 7:00AM-4:00PM
On-call Pathologists are available 24 hours / 7 days.
Contact the Surgical Pathology Resident at pager 293-PAGE ext 9870.

Cytology Processing Laboratory-Courier Delivery, Telephone, and Hours of Operation:
Delivery: Cytology Processing @OSUMC
S326 Rhodes Hall
410 West 10th Avenue
Columbus, OH 43210
Telephone: 614/293-8687

Processing Lab Operation: Monday – Friday 8:30AM to 6:30PM
Cytology Office Hours: Monday-Friday 8:00AM to 5:00PM

Mailing Address (overnight deliveries):
The OSU Medical Center
Division of Cytopathology
S305 Rhodes Hall
450 West 10th Avenue
Columbus, Ohio 43210

Collection of Specimens for Surgical Pathology

For Direct Immunofluorescence (IF) examination utilizing antisera directed against the following proteins: IgG, IgA, IgM, C3, C1q, submit specimen in tissue transport medium or Zeus Science Tissue "Fixative". Samples obtaines at OSUWMC Main Campus contact the Surgical Pathology Gross Room at (614) 293-4875 to obtain. Samples obtained at OSUWMC East Campus; contact UHE Lab at 614-257-3980. Specify "*for IF Only*" in red ink on the request form.

Biopsy, Heart, Diagnostic (Native, Transplant)
For routine examination by Light Microscopy: submit specimen in 10% neutral buffered Formalin.
For Immunofluorescence examination of in-house patient specimens, submit specimen in saline moistened gauze.
For Electron Microscopy examination, submit in glutaraldehyde (0.5 to 3% buffered). An acceptable substitute is 10% buffered formalin. For questions/concerns about unusual specimens, please contact the EM Lab at (614) 293-8806.
Deliver all specimens to 415E Doan Hall before 5pm weekdays. If closed, notify resident on call pager at 614-293-PAGE ext 9870.
Same day processing: if necessary, heart biopsies can be processed the same day if:
1. Arrangements have been made through the Pathologist on transplant service, and
2. The biopsy is delivered directly to the Surgical Pathology Lab, E415 Doan Hall, by 2pm, Monday - Friday.

** (Test not performed at UHE)

Biopsy, Liver Transplant, Diagnostic
Submit liver transplant biopsy in 10% neutral buffered Formalin. Deliver to E415 Doan Hall. If Surgical Pathology is closed, place specimens and paperwork in the refrigerator outside E415 Doan.
After 5pm and all hours on weekends, notify the pathology resident on call about the specimen.

Liver transplant biopsies are routinely processed on Saturday if specimens are submitted before 8pm on Friday. For non-routine liver biopsy, the respective Transplant Service fellow must contact the Pathology resident pager at 614-293-PAGE ext 9870. ** (Test not performed at UHE)

Biopsy, Renal, Diagnostic:
Testing includes light microscopy, immunofluorescence, and electron microscopy.
Submit renal biopsy for routine examination in saline moistened gauze. If the physician who performs the biopsy has access to a dissecting microscope, divide and submit the tissues in the appropriate fixatives including 10%buffered formalin,Tissue Transport Medium or Zeus Fixative and 3% glutaraldehyde (if available). Deliver biopsy to E415 Doan Hall. If Surgical Pathology is closed, notify the pathology resident on call to make arrangements for specimen delivery.
Transplant renal biopsies are routinely processed same day (STAT) if received by 2:00pm weekdays.
Saturday and Sunday: stat processing is also provided if necessary. Native kidney biopsies can be processed stat, if

1. Arrangements have been made through the Pathologist on renal/ transplant service, and
2. The biopsy is delivered directly to the Surgical Pathology Lab, E415 Doan Hall
3. For UHE specimens call the lab@257-3980 in advance of procedure.

Biopsy, Skin Salt Cleaved
Submit specimen in saline soaked gauze (unfixed) or tissue transport medium, Zeus fixative or Michel's medium. The submitting physician should state on the requisition that the specimen should be treated as "skin salt cleaved". Contact the immunofluorescence lab @ 614/293-3572 for additional information.

Bone Marrow, Diagnostic
Specimens must be fixed in 10% buffered formalin. Label specimen container with date and time when the specimen was placed into fixative. Specimens must be properly identified and labeled with patient demographics and specimen type.
Deliver to E415 Doan Hall. If Surgical Pathology is closed, place specimens and paperwork in the refrigerator outside E415 Doan.
For UH East specimens, refer to APE-22, *Bone Marrow Specimen Processing*.

Direct Immunofluorescence - Skin Biopsy
Skin or Oral mucosal Biopsy: call Immunofluorescence Lab at (614) 293-3572 for further information.

Frozen Section, Diagnostic
Specimens must be properly identified and labeled with patient demographics and specimen type. Specimens must be fresh or may be in saline. All specimens must be accompanied by appropriate Request for Pathologic Examination form. Results will be reported directly to the physician only.
Specimens must be hand carried to Surgical Pathology, E415 Doan Hall or 3rd floor Pathology Lab at UHE
This procedure is offered 24 hours/day. After 5pm and all hours on weekends, notify the pathology resident on call @ pager 614-293-PAGE ext 9870. UHE frozen sections outside of the hrs of 7:30-5:00PM, M-F, will be transported to OSU Hospital for processing. Contact the Resident on call ahead to make arrangement. Deliver frozen section specimen with the appropriate requisition to CPA, 3rd Floor North Wing at UHE.

Nerve/Muscle Biopsy
At least 24 hours prior to the procedure, contact the Surgical Pathology Gross Room @ 293-4875 or for UH East specimen, 614/257-3980. Relay patient information, ordering physician, expected procedure date / time and specific clinical indications for testing. NOTE: In special cases, unique collection instructions and media are required for proper specimen triage prior to transport to Nationwide Children's Hospital for testing.

Surgical Specimens, Diagnostic
OSU Health System Inpatient Specimen Requirements: submit fresh specimens on a saline-dampened Telfa or gauze. **Do NOT immerse in saline**.

Label specimens with patient demographics and specimen type. All specimens must be accompanied by a completed SurgPath requisition.

Outpatient and Outreach Specimen requirements: submit routine biopsy in 10% Formalin. A requisition form must accompany each specimen.

Collection of Specimens for Cytology

Gynecologic Pap Smears
Conventional Smears: Smear the specimen directly on a glass slide and immediately fix with spray fixative. **Label the frosted end of the slide with a lead pencil. Do not use a marker or pen**. Place the slide in a cardboard mailer.
Liquid Based Pap Smears:

Sure Path® Collection Kit:
Label the Preservative Vial with the patient's name and medical record number. Visualizing the cervical OS, slowly insert the extended bristles of the Broom (Cervix Broom) into the OS. Begin to rotate the device in a clockwise direction. As you begin to rotate, the longer central bristles will become rigid.

Note: The bristles are designed in the shape of a half moon. One edge is therefore flat. Rotating the Broom clockwise allows the flat side or cutting edge of the bristles to remove epithelial cells. Counterclockwise motion results in the smooth or non-cutting edge to ride over the epithelium and is less abrasive.

Gently push the device towards the cervix while still rotating in a clockwise direction. The longer central bristles will insert into the endocervical canal while the lateral bristles will splay out over the ectocervix. Continue to rotate 5 complete 360-degree turns. Remove the device from the patient.

Using thumb and forefinger, dislodge (push off) the head of the device into the preservative vial. The Broom head must be deposited into the vial to ensure that 100% of the cells collected are submitted to the laboratory for processing. Cap the vial, making sure it is on tight and does not leak.

Thin Prep® Collection Kit:
Method for using the Endocervical Brush/Spatula:
Obtain an adequate sampling from the ectocervix using a plastic spatula. Rinse the spatula into the PreservCyte Solution vial by swirling the spatula vigorously in the vial 10 times. Discard the spatula. Obtain an adequate sampling from the endocervix using an endocervical brush device. Insert the brush into the cervix until only the bottom most fibers are exposed. Slowly rotate ¼ or ½ turn in one direction. DO NOT OVER ROTATE.

Rinse the brush in the PreservCyte Solution by rotating the device in the solution 10 times while pushing against the PreservCyte vial wall. Swirl the brush vigorously to further release material. Discard the brush. Tighten the cap so that the torque line on the cap passes the torque line on the vial. Label the vial appropriately.

Method for using the Broom-like device
Obtain an adequate sampling from the cervix using a broom-like device. Insert the central bristles of the broom into the endocervical canal deep enough to allow the shorter bristles to fully contact the ectocervix. Push gently and rotate the broom in a clockwise direction 5 times.

Rinse the broom into the PreservCyt solution vial by pushing the broom into the bottom of the vial 10 times, forcing the bristles apart. As a final step, swirl the broom vigorously to further release material. Discard the collection device. Tighten the cap so that the torque line on the cap passes the torque line on the vial. Label the vial appropriately.

Urine For Cytologic Exam:
Collect all urine, including bladder washings, barbotages and catheterized specimens, in a sterile container with cytology fixative if available. Some experts recommend 3 consecutive early morning samples for the highest yield. (These should not be first morning specimens). The patient may also be hydrated before collection for a better cell yield. Label all specimens with source and whether they are catheterized or voided. Send to lab immediately. In the event of delayed delivery or no fixative available, refrigerate the specimen.

Cerebral Spinal Fluid for Cytologic Exam:
Mix the specimen with an equal part of cytology fixative. Fixative used in Cytology is CytoRich Red. If fixative is unavailable, send specimen to Cytology immediately or refrigerate. Once fixative is added to the specimen, no other tests can be performed including Flow Cytometry.

Sputum for Cytologic Exam:
The patient should be well-informed about producing a deep cough specimen. After rinsing their mouth, they should expectorate into a wide-mouth plastic container, which contains cytology fixative (CytoRich Red). If fixative is not available, refrigerate until it can be promptly delivered to the lab. The container should be labeled properly, placed in a plastic biohazard bag and sealed. The properly completed requisition should be place in the outside pocket.

Bronchial Washings And BAL for Cytologic Exam:
Label the collection trap with the patient's name, medical record number and source. Place it in a plastic biohazard bag and seal. Place the properly filled out requisition in the outside pocket.

Bronchial Brushes for Cytologic Exam:
If disposable brushes are being used, cut the brush off into a tube containing cytology fixative. If fixative is not available, make sure the brush is covered with normal saline. Label the tube with source of the specimen.
If not using a disposable brush, upon removing the brush from the bronchoscope, rotate it gently on a glass slide and fix immediately with spray fixative or immerse in 95% alcohol.

Body Cavity Fluids for Cytologic Exam:
Collect and send as much body cavity fluid as possible and label the container with the patient label **and** source of specimen. Refrigerate until collection container can be sent to Cytology for processing.

Gastrointestinal Specimens for Cytologic Exam:

Gastric brushings:
Prepare thin smears on labeled glass slides and spray fix immediately. If using disposable brushes, cut the brush into a labeled plastic screw-capped tube containing cytology fixative or normal saline.

Gastric Washings:
Mix the fluid with equal parts of cytology fixative in a labeled plastic screw-capped collection cup.

Fine Needle Aspirations:
Collect the fine needle aspiration in a syringe. Prepare glass slides by expressing material from the needle onto a properly labeled slide, one drop at a time for each slide, and then smear together. Allow the slides to air dry. After the slides are made, place any remaining fluid in a tube containing RPMI or CytoRich Red. Submit all slides and remaining fluid tube to Cytology.

If the specimen requires Flow Cytometry testing, collect in RPMI and clearly mark "For Flow Cytometry" on the container and requisition.

On the OSUWMC central campus, Fine Needle Aspiration collection on palpable lesions by a Cytopathologist or Cytology Fellow may be arranged by calling the Cytology department at 293-8687.