

**Collection, Preparation and Handling of Lab Specimens****SCOPE:**

This procedure applies to Associates who collect laboratory specimens.

**OBJECTIVE:**

Adequate patient preparation, specimen collection, and specimen handling are essential prerequisites for accurate testing. The accuracy of test results is dependent on the integrity of specimens. This procedure provides instructions for the proper collection, handling, and management of all specimens submitted for laboratory testing. All specimens submitted for testing to the lab should be collected and managed utilizing these procedures to ensure accurate test results in a timely manner.

**CORE VALUES and ETHICAL RELIGIOUS DIRECTIVES:**

While all CSRHS policies and procedures reflect CHRISTUS Health's Core Values and its mission "to extend the healing ministry of Jesus Christ", this procedure primarily addresses the Core Values of Excellence and Stewardship as it outlines expectations related to appropriate laboratory practices.

With regards to the ERDs for Catholic Health Care Services, CHRISTUS Santa Rosa affirms the organization's commitment to health care ministry and upholds the organization's distinctive Catholic identity. This procedure has been reviewed for ERD applicability. As this procedure addresses the standardized process and expectations for laboratory testing, it directly impacts the obligation to maintain professional standards and adhere to the ERDs.

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## Collection, Preparation and Handling of Lab Specimens

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## Collection, Preparation and Handling of Lab Specimens

### 1.0 Collector Guidelines

All specimens, which are submitted to the laboratory, must have an accompanying requisition.

All patients must be properly identified before a specimen is collected.

All specimens will be positively identified.

Prior to each collection, review the appropriate test description, including the specimen type to be collected, the volume, the procedure, the collection materials, and the storage and handling instructions.

**1.1 Test Requisitions (LIS and Manual)** The requisition must include the following information which must be legible on all copies.

- 1.1.1** Patient full name (last and first)
- 1.1.2** Age/Sex
- 1.1.3** Physician ordering test(s)
- 1.1.4** Identity of person filling out requisition
- 1.1.5** Specimen Source
- 1.1.6** Test(s) requested
- 1.1.7** For cultures, an order must be written for every sample submitted and must include source, test, and when appropriate, the type of infection and/or organism suspected.
- 1.1.8** **Note:** Clarify if multiple cultures are needed per specimen, (i.e., aerobic and anaerobic for one sample)
- 1.1.9** Diagnosis and/or ICD 10 Code
- 1.1.10** Test Order Number
- 1.1.11** Time & Date requested
- 1.1.12** Status or Priority (Routine, urgent, STAT or Special Time)
- 1.1.13** Date & Time specimen collected and Meditech log in of the collector (phlebotomist or nursing staff)
- 1.1.14** Incomplete requisitions may require that the patient return to the requesting physician's office to obtain the necessary information. Every effort will be made to avoid having the patient return to the physician's office.

### 1.2 Patient Identification Requirements

- 1.2.1** Patients must have a CHRISTUS Santa Rosa patient identification bracelet physically attached to them before any sample can be collected. The patient name and account number on the bracelet is matched to the demographic information on the LIS collection label or manual test requisition and verbally confirmed with the patient before collection.
- 1.2.2** **NOTE:** Hospital ID bracelets attached to a bed or chart area are not acceptable.
- 1.2.3** Identification for Blood Bank specimen collection is of particular importance due to the critical nature and potential implications of transfusion. Refer to the Blood Bank Specimen Collection SOP for instruction on collecting these samples which use the Secureline Blood Bank ID bracelet.
  - 1.2.3.1** All Type and Screen or Crossmatch orders need to be verified with the Blood Bank before samples are collected.
  - 1.2.3.2** Secureline Blood Bank bracelets should only be removed upon the direction of blood bank personnel.
  - 1.2.3.3** Blood types collected for Rhogam assessment do not require the Secureline Blood Bank label.

### 1.3 Specimen Label Requirements

- 1.3.1** Primary Specimen Containers:

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- 1.3.1.1 Each specimen must have a label that contains a minimum of two patient identifiers. The labels must be attached to the container holding the specimen (not the lid since it is removable). The label must be complete, with at least two patient identifiers and the following information:
  - 1.3.1.2 Patient's name (last & first with no abbreviations.)
  - 1.3.1.3 Hospital/Medical Record Number or Account number
  - 1.3.1.4 Date & Time of collection
  - 1.3.1.5 Meditech log in of person collecting the specimen
  - 1.3.1.6 There should be no doubt as to the specimen source, which is necessary for swabs, ureter or kidney specimens, etc. Label the specimen as to the source, i.e., left nostril, right knee, urine from right ureter, etc.
  - 1.3.1.7 Do not label culture specimens only as "wound" without giving a specific description and the anatomic source. Note whether the exudate is an open or closed wound. Indicate aerobic or anaerobic culture requests.
- 1.3.2 Slides prepared directly at the bedside, such as fine needle aspirations and bone marrow aspirations, will have patient's full name and date of birth written on the frosted end of the slide at the time of procedure. Slide specimen labels must be complete with at least two patient identifiers, which could include:
  - 1.3.2.1 Patient's name (last & first with no abbreviations)
  - 1.3.2.2 Date of birth
  - 1.3.2.3 Hospital/Medical Record Number or Account number
- 1.3.3 Secondary Specimen Container:
  - 1.3.3.1 In subsequent phases of testing, a sample unique identifier may be used. This may apply to, but not limited by the following samples:
  - 1.3.3.2 Aliquots
  - 1.3.3.3 Tissue Blocks
  - 1.3.3.4 Dilution tubes
  - 1.3.3.5 Images
  - 1.3.3.6 Tubes
- 1.3.4 Specimens, which are submitted without any identification/mislabeled, cannot be accepted by the laboratory for testing and will be discarded after the physician ordering the test(s) is notified of the situation.
- 1.3.5 Unlabeled or mislabeled specimens that cannot be recollected (CSF, Catheter tips for cultures or other difficult to collect samples) may be considered for exception to the labeling policy.
  - 1.3.5.1 The request to label or re-label must be made by the charge nurse, nurse manager or physician to the laboratory supervisor on duty.
  - 1.3.5.2 In these exceptions, a *Statement of Responsibility for Patient Identification* form must be filled out and the collector of the sample may come to the laboratory, verify the identity of the specimen and then correctly label it.
  - 1.3.5.3 **NOTE:** This does not apply to Blood bank samples. No collections for Blood bank testing may be re-labeled or modified.
  - 1.3.5.4 Unlabeled or mislabeled specimens must not leave the laboratory for any reason. They are not to be returned to the collector or area the sample was collected.

## Collection, Preparation and Handling of Lab Specimens

### 1.4 Transport Guidelines

#### 1.4.1 Microbiology Culture Samples-General

- 1.4.1.1 Transport the specimen to the laboratory as quickly as possible.
- 1.4.1.2 Refrigerate the specimen if it is not to be cultured within 1 hour, for non-respiratory specimens.
- 1.4.1.3 Do not refrigerate respiratory specimens.
- 1.4.1.4 Bacterial culturettes may be left at room temperature.
- 1.4.1.5 Anaerobic cultures need to be submitted in transport media made specifically for anaerobic cultures or culturette transport media that contains gel.

#### 1.4.2 Urine samples

- 1.4.2.1 Refrigerate the urine if it is not delivered to the laboratory within 1 hour of collection. Place the urine specimen in the refrigerator until it can be transported.
- 1.4.2.2 Urine samples submitted in a C&S Preservative Urine Tube for culture testing can be stored at room temperature for up to 48 hours.

#### 1.4.3 Other Sources:

- 1.4.3.1 Some sources may require different transport instruction. Refer to specific specimen sources for applicable transport guidelines.

### 1.5 Minimizing Blood Volume in Phlebotomy

- 1.5.1 Careful consideration of all tests requested is made prior to phlebotomy in order to minimize the amount of blood collected while providing sufficient sample for requested examination. The volume of blood sample must be minimized at all times, with special attention to pediatric requests. The phlebotomists/technologist must review the laboratory requests carefully and determine if one tube of blood can be drawn for all or several tests, rather than collecting individual tubes for each test requested. All POC Testers have been advised to collect the minimum blood volume to conduct testing.

## 2.0 Collection, Preparation & Handling of Blood Specimens

- 2.1 **Selection of Blood Collection Site.** Before collecting blood specimens from patients, select an appropriate collection site.

- 2.1.1 Laboratory personnel will collect blood only from an upper extremity.
- 2.1.2 Laboratory personnel will collect only venous or capillary blood from the patient.
- 2.1.3 Do not select a collection site on an arm labeled "Restricted." This label is usually used on surgical patients (i.e. mastectomy, lumpectomy...)
- 2.1.4 If the patient has an intravenous line (IV):
  - 2.1.4.1 Laboratory personnel will request the IV pump be stopped by the patient's nurse.
  - 2.1.4.2 Ensure the IV infusion has been turned off for a minimum of 2 minutes before proceeding to blood collection.
  - 2.1.4.3 Select a blood collection site that is below the IV site.
  - 2.1.4.4 If there are no available sites below the IV site, proceed to blood collection and discard the first 10mL of blood collected.
  - 2.1.4.5 The laboratory personnel will notate on the patient labels if the specimen was drawn above the IV site.

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**2.2 Routine Blood Collection using Evacuated Blood Collection System.** To obtain blood specimens for analysis, venipuncture with a vacuum containing system is the preferred method. This method offers flexibility in terms of specimen volume and choice of anticoagulants. Needles will be used that incorporate safety features designed to reduce and/or eliminate needle stick accidents. Needles are disposable, thereby complying with OSHA requirements

### **2.2.1 Reagents, Materials and Equipment**

- 2.2.1.1** Multi-sample needle
- 2.2.1.2** Holder for multi-sample needle (barrel)
- 2.2.1.3** Tourniquet
- 2.2.1.4** Alcohol prep pad
- 2.2.1.5** 2 X 2 gauze
- 2.2.1.6** Evacuated blood tubes
- 2.2.1.7** Band-Aid
- 2.2.1.8** Protective clothing: gloves, lab coat and goggles (if necessary)

### **2.2.2 Venipuncture Procedure (Using Evacuated Blood Collection System)**

- 2.2.2.1** Establish the patient's identity using at least two patient identifiers. Ask patient for date of birth (If patient is capable of providing this information) and verify with label. Always verify the name and account/medical record number by checking I.D. on wristband.
- 2.2.2.2** Determine the type and number of tubes needed for tests ordered.
- 2.2.2.3** Thread the needle into the holder until it is secured, using the needle sheath as a wrench.
- 2.2.2.4** Make sure that the patient's arm or other venipuncture site is in a downward position and maintain the tube below the site throughout the procedure. This will insure that any back flow from the tubes will not go into the patient's vein.
- 2.2.2.5** Wear the appropriate protective clothing. Gloves must be worn at all times and changed after drawing each patient.
- 2.2.2.6** Apply the tourniquet. Select by palpation the vein to be used.
- 2.2.2.7** Cleanse the venipuncture site with an alcohol prep pad, using a circular motion.
- 2.2.2.8** **NOTE:** If a blood alcohol (ethanol) test is ordered, alcohol pads are not to be used for cleansing the site. A preparation pad containing Povidone-Iodine will be used for cleansing the site.
- 2.2.2.9** With the bevel edge on the needle facing up, insert the needle into the vein. A sensation of resistance will be felt, followed by ease of penetration as the vein is entered.
- 2.2.2.10** Push the tube into the holder (barrel) until the butt end of the needle punctures the stopper. Make sure to collect the tubes in the proper order (i.e. blue, red, green, lavender, gray). If blood cultures are also ordered, draw them before any tubes.
- 2.2.2.11** With the tube, fill until the vacuum is exhausted and blood flow ceases, gently inverting tubes 5-10 times after filled.
- 2.2.2.12** Remove tourniquet as the last tube is being filled. Remove the tube from the holder. Place the clean gauze over the puncture site. Remove the needle from the patient's vein. Immediately apply pressure to the puncture site.
- 2.2.2.13** Needles with designed safety features must be used at all times. However, there may be an occasion where this is not practical. In that situation, the used needle is

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**never** to be recapped. Sharps containers are provided for each drawing basket. The needle is placed in the needle slot and unscrewed so that it drops in the container.

**2.2.2.14** Label and initial tubes at the bedside.

**2.2.2.15** When the bleeding has stopped, place a band-aid over the puncture site; do not leave any patient until bleeding ceases. Dispose of all contaminated material in biohazard containers.

**2.3 Routine Blood Collection using Skin Puncturing and Micro-container Blood Collection System:** A micro-sampling technique is available for infants (heel stick), children and adults when a regular venipuncture is not possible. (i.e., the patient has an I.V. in both hands, or veins difficult to obtain blood from due to repeated sampling).

### **2.3.1 Reagents, Materials and Equipment**

**2.3.1.1** Capillary Puncture Device

**2.3.1.2** Alcohol prep pad

**2.3.1.3** 2 X 2 gauze

**2.3.1.4** Microcontainers

**2.3.1.5** Band-Aid

**2.3.1.6** Gloves

### **2.3.2 Procedure: Finger Puncture**

**2.3.2.1** Establish the patient's identity using at least two patient identifiers. Ask patient for date of birth (If patient is capable of providing this information) and verify with label. Always verify the name and account/medical record number by checking I.D. on wristband.

**2.3.2.2** Wear gloves at all times, changing them between patient draws.

**2.3.2.3** Choose a finger that is not cold, cyanotic (blue) or swollen.

**2.3.2.4** Select the puncture site and cleanse with alcohol.

**2.3.2.5** Hold finger in a downward position, using the meaty edge of the finger only

**2.3.2.6** Grasp the lancet firmly and in one continuous deliberate motion, puncture the finger across the fingerprints.

**2.3.2.7** Since the first drop of blood may contain tissue fluid and would not be a true representative sample of the patient's blood, it should be wiped away with a clean piece of gauze.

**2.3.2.8** Blood should well up into large, rounded drops. Collect drops in a micro-container. Gently massage the finger during collection to encourage good blood flow.

**2.3.2.9** **NOTE:** AVOID excessive squeezing or one may cause the flow of tissue fluid which tends to dilute the sample as well as hasten the clotting of blood.

**2.3.2.10** When finished, place a piece of dry, sterile gauze on the puncture site and hold it in place until bleeding has stopped.

**2.3.2.11** Place Band-Aid over puncture site unless the patient is under 2 years of age.

**2.3.2.12** Label micro-container and initial. Note time on requisition.

**2.3.2.13** Dispose of lancet and all contaminated material in appropriate sharps/biohazard containers.

### **2.3.3 Procedure: Heel Stick**

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- 2.3.3.1** Establish the patient's identity using at least two patient identifiers. Ask patient for date of birth (If patient is capable of providing this information) and verify with label. Always verify the name and account/medical record number by checking I.D. on wristband.
- 2.3.3.2** Wear gloves at all times and change with each new patient.
- 2.3.3.3** Cleanse the heel with alcohol.
- 2.3.3.4** Grasp foot in hand and select a site on the meaty edge of the heel.
- 2.3.3.5** Place the puncture device firmly in the prepared site and puncture.
- 2.3.3.6** Wipe away the first drop of blood using a clean piece of gauze.
- 2.3.3.7** Gently squeeze the heel and collect the drops of blood in a microcontainer.
- 2.3.3.8** **NOTE:** Remember to avoid excessive squeezing.
- 2.3.3.9** When finished, place a piece of dry sterile gauze on the puncture and hold in place until bleeding has stopped.
- 2.3.3.10** Place Band-Aid over puncture site.
- 2.3.3.11** Label micro-container and initial. Note the time on the requisition.
- 2.3.3.12** Dispose of the puncture device and all materials in the appropriate sharps/biohazard containers.

**2.4 Routine Blood Collection from Intravenous Lines:** Venipuncture is the preferred blood collection method, however, when venipuncture is not possible, non-laboratory personnel can collect blood specimens from an intravenous line.

### **2.4.1 Reagents, Materials and Equipment**

- 2.4.1.1** 10 mL luer lock syringe without needle
- 2.4.1.2** Holder for multi-sample needle (barrel)
- 2.4.1.3** Normal Saline (NS)
- 2.4.1.4** Appropriate flushing solution per protocol
- 2.4.1.5** Alcohol prep pad
- 2.4.1.6** Evacuated blood tubes
- 2.4.1.7** Protective clothing: gloves, lab coat and goggles (if necessary)

### **2.4.2 Procedure: Collecting blood from an intravenous (IV) line**

- 2.4.2.1** Establish the patient's identity using at least two patient identifiers. Ask patient for date of birth (If patient is capable of providing this information) and verify with label. Always verify the name and account/medical record number by checking I.D. on wristband.
- 2.4.2.2** Determine the type and number of tubes needed for tests ordered.
- 2.4.2.3** Shut off all IV infusions
- 2.4.2.4** Clean adapter device by vigorously scrubbing with an alcohol prep pad for 15 seconds, and allow to completely air dry.
- 2.4.2.5** Maintaining sterility, attach barrel or syringe to line adapter device.
- 2.4.2.6** Flush IV lines with appropriate flushing solution before collecting samples.
  - 2.4.2.6.1** Collection of blood for coagulation testing through intravenous lines that have been previously flushed with heparin should be avoided, if possible.
  - 2.4.2.6.2** If the blood must be drawn through an indwelling catheter, possible heparin contamination and specimen dilution should be considered.
  - 2.4.2.6.3** When obtaining specimens from indwelling lines that may contain heparin, the line should be flushed with 5 mL of saline, and the first 5 mL of blood or



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6-times the line volume (dead space volume of the catheter) be drawn off and discarded before the coagulation tube is filled.

**2.4.2.6.4** For those samples collected from a normal saline lock (capped off venous port) twice the dead space volume of the catheter and extension set should be discarded.

**2.4.2.7** Collect blood specimens using the proper order of draw, and gently invert tubes 5-10 times after filling.

### 2.5 Newborn Screening

The newborn Screening Program aids in the detection of the following genetic and metabolic disorders: phenylketonuria, galactosemia, homocystinemia and congenital hypothyroidism. If any of these tests are Positive, the physician can then initiate diet or drug treatment to prevent the development of mental retardation and associated medical complications.

#### 2.5.1 Reagents, Materials and Equipment

**2.5.1.1** Neonatal Screening Forms: NBS Medicaid/Charity for Medicaid recipients and NBS Insurance/Self-pay for all others.

**2.5.1.2** Capillary Puncture Device: *Lancet* or *Quick Heel*.

**2.5.1.3** 2X2 gauze

**2.5.1.4** Gloves

**2.5.1.5** Alcohol prep pad

#### 2.5.2 Procedure

**2.5.2.1** **NOTE:** The collection of the specimen for this newborn screening test is recommended as late as possible prior to hospital discharge, or 48 hours after the infant has received the first milk feeding.

**2.5.2.2** When the phlebotomist arrives in the nursery, the nurse should have already in possession the appropriate Texas Department of Health Bureau of Laboratories NBS form (with blood collection filter paper card attached to the bottom). The form should be completely filled out with the patient's demographics and other required information.

**2.5.2.3** Hold the infant's limb in a dependent position before making the heel puncture.

**2.5.2.4** A heel warmer may be used to aid in obtaining blood flow.

**2.5.2.5** Cleanse the infant's heel with an alcohol prep pad.

**2.5.2.6** Allow the heel to dry and then make the skin puncture on the meaty edge of the heel.

**2.5.2.7** Wipe away the first drop of blood.

**2.5.2.8** Allow drops to form and apply directly to the blood collection filter paper card. Apply to one side of the card while viewing from the opposite side to insure complete saturation of the entire circle. Fill all five circles, avoiding layering and excessive squeezing.

**2.5.2.9** When finished, place gauze over the puncture site and apply pressure until the bleeding stops.

**2.5.2.10** Return the NBS form with specimen-saturated filter paper to the lab. There should be a second NBS form filled out with the same patient's demographics for use when the patient returns in 2-4 weeks. Return this form to lab as well.

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- 2.5.2.11** **NOTE:** The nurse will instruct the parents about returning for the follow-up PKU test.
- 2.5.2.12** Allow the specimen-saturated filter card to thoroughly dry (at least for 3 hours) in a horizontal position. Do not stack cards if there are several cards.
- 2.5.2.13** Mail the envelope to the Texas Department of Health, 1100 West 49<sup>th</sup> St., Austin, TX 78756.
- 2.5.2.14** Store the second NBS form (labeled with the patient's demographics) in the designated area within the Lab Specimen Processing area.

### 2.5.3 Results

- 2.5.3.1** The newborn screen PKU test is ordered in the laboratory/hospital information system, and all information is interfaced with the Texas Department of Health.
- 2.5.3.2** PKU results from valid specimens are electronically transmitted into the patient's electronic medical record from the Texas Department of Health.
- 2.5.3.3** Positive or abnormal results from valid specimens are electronically transmitted and called to the ordering physician by the Texas Department of Health.
- 2.5.3.4** If the PKU specimen is unsatisfactory, or if results are invalid and unable to transmit from the Texas Department of Health into the laboratory/hospital information system, the Texas Department of Health will fax a report to the submitting laboratory. Then it is the laboratory's responsibility to communicate the results to the ordering physician.
- 2.5.3.5** The laboratory will monitor test completion and reporting (including those requested for repeat testing), and ensure results are entered into the laboratory information system timely.

### 2.5.4 Unsatisfactory PKU Specimens Unsatisfactory specimen may result for the following reasons:

- 2.5.4.1** All circles are not completely filled in properly.
- 2.5.4.2** All filled circles are not thoroughly saturated.
- 2.5.4.3** Uneven saturation is present due to multiple sample applications or use of capillary tubes.
- 2.5.4.4** Specimen appears contaminated.
- 2.5.4.5** Clotted or caked blood present on the filter paper.
- 2.5.4.6** Assay interference possibly due to antibiotic therapy or other inhibitor substance.
- 2.5.4.7** Paperwork incomplete or improperly completed.
- 2.5.4.8** Filter paper card separated from NBS Form.
- 2.5.4.9** Specimen received later than 5 days following date of collection.
- 2.5.4.10** Specimen collected sooner than 24 hours after protein intake.
- 2.5.4.11** Specimen collected prior to 36 hours of age.
- 2.5.4.12** Infant of abnormal low birth weight.

## 3.0 Collection, Preparation & Handling of Body Fluids

### 3.1 Random Urine Specimens

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- 3.1.1** See Microbiology Specimens for proper urine collection requirements for urine samples other than 24 hour collections.

### 3.2 Routine 24-Hour Urine Collection

- 3.2.1** For many urine chemistry tests, it is necessary to analyze a sample taken from an entire 24-hour excretion. Incorrect collection and preservation of 24-hour urine collections are two of the most frequent errors in laboratory medicine. The 24-hour urine specimen should be submitted in a chemically clean, properly labeled urine container. (Patient's should not be allowed to submit urine specimens in their own "clean" jars.) The laboratory adds required preservatives or supplies the proper preservatives with the container.
- 3.2.2 Recommended Patient Instructions for 24-hour Urine Collections.**
- 3.2.2.1** This section includes written instructions to be provided to the patient with the specified laboratory collection container. **Collection containers that include acids should be clearly marked.**
- 3.2.2.2 To the Patient:** Follow these instructions in collecting your 24-hour urine specimen.
- 3.2.2.3** You will find it more convenient to void (urinate) into the smaller container provided and transfer the urine into the larger collection container. Do **not** add anything but urine to the container and do **not** pour out any liquid or powder that may already be in the collection container. These substances may cause burns if touched. The collection container should be kept refrigerated throughout the collection period.
- 3.2.2.4** Upon arising in the morning, urinate into the toilet, emptying your bladder completely. Do **not** collect this sample. Note the exact time and print it on the container label.
- 3.2.2.5** Collect all urine voided for 24 hours after this time in the container provided by the physician. All urine passed during the 24-hour time period (day or night) must be saved. Urine passed during bowel movements must also be collected.
- 3.2.2.6** Refrigerate the collected urine between all voiding or keep it in a cool place.
- 3.2.2.7** At exactly the same time the following morning, void completely again (first time after awakening), and add this sample to the collection container. This completes your 24-hour collection.
- 3.2.2.8** Take the 24-hour specimen to the laboratory as soon as possible, maintaining the cool temperature in transit by placing the specimen in a portable cooler or insulated bag.

### 3.3 Other Fluids

- 3.3.1** The following fluids are to be obtained only by a physician or a qualified nurse and should be transported as soon as possible to the laboratory for processing.
- 3.3.1.1** Cerebrospinal Fluid
- 3.3.1.2** Upon receipt into the laboratory, all CSF collections are processed STAT.
- 3.3.1.3** Any CSF samples collected at a CSRS satellite location, with referral testing to be performed will be sent out by STAT courier.
- 3.3.1.4** Pleural-Thoracentesis Fluid
- 3.3.1.5** Abdominal Peritoneal Fluid
- 3.3.1.6** Joint Fluids

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### 4.0 Collection, Preparation and Handling of Microbiology Specimens

#### 4.1 Blood Cultures

**4.1.1** Blood cultures must be collected in a manner which will increase the chance of microbial isolation and also keep contamination to a minimum.

#### 4.1.2 Reagents, Materials and Equipment

**4.1.2.1** CHG (chlorhexidine gluconate) skin antiseptic

**4.1.2.2** Alcohol pad

**4.1.2.3** Blood culture bottles

**4.1.2.4** Gloves

**4.1.2.5** Band-Aid

**4.1.2.6** Vacutainer, syringe/needle setup, or diversion device

**4.1.2.7** 2X2 gauze

**4.1.2.8** Tourniquet

**4.1.3 Site Selection:** A different body site must be chosen for each culture drawn. Avoid drawing blood from indwelling intravascular catheters since contamination may be an issue. Draw only this way if a venipuncture cannot be performed.

**4.1.4 Blood Culture Collection Procedure (Note:** If other lab tests are also requested, make sure the blood cultures are drawn first).

**4.1.4.1** Tie tourniquet and find a suitable vein for the venipuncture. Release the tourniquet.

**4.1.4.2** Initially clean the site with an alcohol pad.

**4.1.4.3** Start at the venipuncture site and swab the arm with CHG in an ever-widening circle to a diameter of one inch, being careful not to retrace an area already covered. This is the sterilization step. Do not let anything touch the sterile site. Allow the site to air dry at least 30 seconds. The CHG must be completely dry to be effective.

**4.1.4.4** Note: For patients under two months old, or those with CHG sensitivity, prep the site using alcohol swabs. Once dry, prep the site again with a betadine swab and let air dry.

**4.1.4.5** While waiting for the site to dry, prepare the culture bottles by marking the appropriate fill level and cleansing the bottle top with an alcohol prep. Leave the pad on top of the bottle until the blood is ready to be injected.

**4.1.4.6** Retie the tourniquet.

**4.1.4.7** Perform the venipuncture remembering to maintain the sterility of the arm and the blood cultures bottles. Avoid touching the venipuncture site. If it is necessary to touch the site again, then you must wipe your finger with CHG.

**4.1.4.8** Divert 2 mL of blood into a red-top blood tube (waste tube). Then inoculate the bottles with appropriate amount of blood; 8-10 mL per bottle is optimal for adult bottles, or 1-5 mL for pediatric bottles.

**4.1.4.9** Remove the tourniquet, remove needle, hold gauze and apply pressure to site until bleeding stops, apply bandaid.

**4.1.4.10** Mix blood culture and label appropriately with patient name, patient number, patient location, date and time of collection, collector's Meditech log in, and site of venipuncture. Also, if multiple sets are to be drawn, label set as #1, #2, and/or #3.

**4.1.5 Specimen Quantity:** Volume is critical because the concentration of organisms in most cases of bacteremia is low, especially if the patient is already on antimicrobial therapy. For children draw a minimum of 1-5 mL of blood. Obtain 16-20 mL blood from adults. Equal amounts need to be

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transferred to each Bactec bottle (e.g., if 16 mL are drawn, then transfer 8 mL into each blood culture bottle).

- 4.1.6 Numbering and Timing:** In most cases, bacteremia can be detected by collecting 2 to 3 sets of separately collected blood cultures. On multiple collections the timing is usually dictated by physician's orders, e.g., 3 BC x 15 min. apart. A single blood culture may miss an intermittently occurring bacteremia. Also, it may make it difficult to interpret the clinical significance of certain isolated organisms.

**4.2 Wound Cultures:** The general term "wound" is inappropriate to describe a specimen source. The name of the specific anatomic site is required and must be used. Surface wounds must be distinguished from deep or surgical wounds. The latter are cultured for anaerobic bacteria while surface wounds are not. Attention to skin decontamination is critical. The quality of a wound culture can be assessed by a Gram Stain. The representative specimen is taken from the advancing margin of the lesion, not just pus or exudates. It is critical that the margin of lesions and the wall of abscesses be firmly sampled with the swab. For anaerobic studies, the specimen of choice is an aspirate, not a swab.

### 4.2.1 Skin and Contiguous Tissue

**4.2.1.1 Specimen Selection:** The specimen of choice depends on the extent and character of the infection rather than on the suspect pathogen. For most open lesions, remove the superficial flora before collecting a specimen from the advancing margin. For dry, encrusted lesions, culture is not recommended unless an exudate is present. In the case of a closed abscess the specimen collection site of choice is the exudates itself and the surrounding abscess wall. In the case of an open abscess, decontaminate the skin surrounding the lesion before specimen collection. Culture burn wounds only after extensive cleaning and debridement. The specimen of choice is taken from the advancing lesion, not just the pus. Remove the exudates to reach the interior of the lesion.

**4.2.1.2 Un-ruptured abscess:** Do not swab.

Decontaminate the skin overlying the abscess, and aspirate abscess contents with a syringe. After excision and draining, submit a portion of the abscess wall for culture. Submit the specimen in a swab transport system with gel so it is capable of supporting anaerobic growth as well as aerobic growth.

**4.2.1.3 Open lesions and abscesses:** Remove as much of the superficial flora as possible by decontaminating the skin. Submit the swab in aerobic transport medium. One can also culture a sample of the exudates aerobically. Do not request anaerobic cultures from open, superficial lesions. Consult with the laboratory.

**4.2.1.4 Burn wounds:** Debride the area, and disinfect the wound. As exudate appears, sample it firmly with a swab. Submit the sample for aerobic culture only. Submit biopsy tissue as the specimen of choice. Surface specimens usually represent only colonization.

### 4.2.2 Ear (Otitis Media) Specimens

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The specimen of choice is an aspirate from behind the tympanum (ear drum). The fluid from the inner ear represents the infectious process, not the external ear canal flora. A small swab may be used only when the eardrum has ruptured and fluid can be collected.

### 4.2.2.1 Specimen Collection Materials: Swabs, Antiseptic

**4.2.2.1.1** Clean the external ear canal with antiseptic solution.

**4.2.2.1.2** Collect material from the outer ear with a swab or by scraping the ear.

**4.2.2.1.3** Place the swab and/or scrapings in transport media.

**4.2.2.1.4** Aspirate from the ear maybe submitted in the syringe with the needle removed or maybe placed in sterile container or tube.

**4.2.2.1.5** Specimen Transport: Do not refrigerate the specimen. Transport the specimen to the laboratory as quickly as possible. Hold it at room temperature.

### 4.2.3 Eye Specimen

**4.2.3.1** Specify source, e.g., conjunctival, corneal, lid margin, aqueous or vitreous sample. For conjunctival specimens, the laboratory ideally needs 2 swabs from the infected site: one for culture and one for Gram Stain.

**4.2.3.2** Specimen Collection Reagents and Materials: Swabs, Slides, Antiseptic

**4.2.3.3** Purulent Conjunctivitis: Cleanse the skin around the eye with a mild antiseptic, collect purulent material with a culturette, place the swab into transport media and send to the laboratory at ambient temperature.

**4.2.3.4** Corneal Infections: Swab the conjunctiva as described above, collect multiple corneal scrapings and place into transport media and send to the laboratory.

**4.2.3.5** Intra-ocular fluid: Collect fluid by surgical needle aspiration, deliver immediately to the laboratory at ambient temperature.

### 4.3 Urine Specimens

**4.3.1** General Considerations: Although urine is normally sterile or only transiently colonized with small numbers of organisms, contamination of the urine specimen by organisms normally present in the urethra or on peri-urethral areas can allow a proliferation of these organisms that will cause misleading culture results. In symptomatic patients (painful urination, urgency, frequency), one specimen is usually adequate for diagnosis, and another is obtained 48 – 72 hrs after institution of therapy. In asymptomatic patients, two or three specimens may be necessary. In cases of suspected renal tuberculosis, three consecutive first morning specimens should be submitted. A pooled, 24-hour collection of urine is unacceptable for culture, as is more than one specimen collected and pooled. The requisition form should indicate whether or not the specimen is a clean-catch urine, a catheterized urine, or a supra-pubic aspirate. Urine kept at room temperature supports the growth of both pathogens and contaminants. Unless collected in a C&S Preservative Urine Tube, all urine MUST be refrigerated if it is not cultured within 1 hour of collection. Culture refrigerated urine specimens within 24 hours.

**4.3.2** Clean-Catch Urine Collection: The first morning specimen is preferred. Obtain the specimen after the first portion of urine has been voided. The first portion washes most contaminants from the urethra. The midstream portion represents bladder flora. In pediatric patients, initial

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screening is performed by using a strapped-on bag device after careful cleaning as described below.

### 4.3.3 Specimen Collection Materials

**4.3.3.1** Sterile, screw-cap specimen container.

**4.3.3.2** Antibacterial soap (ordinary soap is acceptable) or commercial preparatory packages. Some commercial antiseptic soaps and disinfectants may irritate the peri-urethral area, and can inhibit bacterial growth upon culture if they contaminate the cup.

**4.3.3.3** Gauze sponges

**4.3.3.4** Rinse water

### 4.3.4 Instructions for Females: Provide the patient with clear verbal and written instructions as follows:

**4.3.4.1** Sit comfortably on the toilet, and swing one knee to the side as far as possible.

**4.3.4.2** Spread the labia with one hand, and after cleansing collect the specimen.

**4.3.4.3** Wash. Be sure to wash and rinse well before you collect the specimen. Using the cleaning material supplied, wipe your vaginal area as carefully as you can from the front to the back between the folds of the skin.

**4.3.4.4** Rinse. After washing with each soap pad, rinse with a water-moistened pad with the same front-to-back motion. Use each pad only once, and discard.

**4.3.4.5** Hold the cup with your fingers on the outside; do not touch the rim. First, pass a small amount of urine into the toilet, and then pass enough urine into the cup to fill it half full.

**4.3.4.6** Place the lid on the cup carefully and tightly, or ask the nurse to do it for you.

### 4.3.5 Instructions for Males: Provide the patient with clear verbal and written instructions.

**4.3.5.1** Retract the foreskin (if un-circumcised), and clean the glans (head of the penis).

**4.3.5.2** Wash. Be sure to wash and rinse well before collecting the specimen. Use the cleaning material supplied.

**4.3.5.3** Rinse. After washing with each soap pad, rinse with a water-moistened pad. Use each pad only once, and discard.

**4.3.5.4** Hold the cup on the outside; do not touch the rim. First, pass a small amount of urine into the toilet, and then pass enough urine into the cup to fill it half full.

**4.3.5.5** Place the lid on the cup carefully and tightly, or ask the nurse to do it for you.

**4.3.6 Catheterized Urine for Culture:** Urine obtained from catheter bags at the bed-side is unacceptable for culture. Foley catheter tips are unacceptable for culture because they cannot be removed without picking up urethral flora. The specimen of choice is urine collected from an indwelling catheter tube through the sampling port.

#### 4.3.6.1 Specimen Collection Materials: 21-gauge needle and syringe, Alcohol swabs

**4.3.6.1.1** If necessary, clamp the catheter tubing to collect urine in the tube, but do not allow the clamp to remain for more than 30 minutes.

**4.3.6.1.2** Clean the sampling port (or tubing site if a port is unavailable) with alcohol swabs.

**4.3.6.1.3** Insert the needle into the tubing port, and withdraw urine into the syringe.

**4.3.6.1.4** Transfer the urine to a sterile cup or tube.



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**4.3.6.1.5** NOTE: Do not disconnect the catheter from the catheter bag to collect the specimen, and never submit bag contents for culture. Patients with indwelling catheters will probably be colonized after 48 to 72 hours, often with multiple isolates. The laboratory must know whether the urine is collected by any method that might introduce contamination: i.e., collection at home in an unconventional container, unknown collection method (from nursing home, etc.).

**4.3.6.2** Supra-Pubic Aspirate for Urine Culture: This technique avoids contamination of urine with urethral or perineal bacteria. The method is required for diagnosing anaerobic urinary tract infections and is most frequently used for pediatric patients, patients with spinal cord injury, and patients for whom a definite culture has not been obtained.

**4.3.6.2.1** Specimen Collection Reagents Materials: Supplies for skin decontamination, Local anesthetic, 22-gauge needle and syringe, Sterile urine container

**4.3.6.2.2** Decontaminate and anesthetize the skin.

**4.3.6.2.3** Introduce the needle into the full bladder at the midline between the symphysis pubis and the umbilicus, 2 cm above the symphysis.

**4.3.6.2.4** Aspirate about 20 mL of urine from the bladder.

**4.3.6.2.5** Transfer the urine aseptically into a sterile screw-cap cup for transport to the laboratory

**4.3.7** C&S Preservative Urine Tubes for Culture and Sensitivity by BD Vacutainer Urine Collection Kit.

**4.3.7.1** Samples submitted in this vacutainer tube can only be used for culture. It cannot be used for urinalysis testing.

**4.3.7.2** Collect the urine by any of the above methods into the urine collection cup contained in the collection kit.

**4.3.7.3** NOTE: There is no preservative in this cup and it may be submitted for urinalysis testing if refrigerated within an hour of collection.

**4.3.7.4** Use the integrated transfer device to fill the urine vacutainer tube.

**4.3.7.5** Collections are acceptable for culture up to 48 hours at room temperature.

### 4.4 Stool or Feces for Cultures or Parasitology Studies:

**4.4.1** The Specimen of choice is a diarrheal stool (the acute stage of illness). The rectal swab for bacterial culture must show feces. Generally, swabs are recommended only for infants. For bacterial pathogens, collect and submit three specimens, one each day for three days. For parasite examination, three specimens collected every other day or every third day should be adequate. A single stool specimen may not exclude bacterial or parasitic pathogens as a cause of diarrhea. To rule out the carrier state for some organisms, three consecutive negative specimens are often needed. Specimens for parasitic examination collected too soon after administration of barium, oil, magnesium, or crystalline compounds are unsatisfactory. Delay specimen collection a minimum of 5 days after administration of these agents.

**4.4.2** Specimen Collection Reagents and Materials

**4.4.2.1** A clean wide mouth container with sealable lid can be used. The smaller the container, the more difficult it is for the patient to provide an appropriate specimen.

**4.4.2.2** Parasitology transport pack (one vial of formalin fixative, one clean vial) or equivalent.



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### 4.4.3 Method

- 4.4.3.1 Instruct patients who are able to excrete directly into the cup or collection device. Never take a specimen from the water in the toilet. Do not allow urine to contaminate the specimen.
- 4.4.3.2 Replace the lid tightly, and refrigerate the specimen.
- 4.4.3.3 Alternately, collect feces from a sterile bedpan, and place 10 to 20 g into container.
- 4.4.3.4 For parasite studies, use either method described above and then bring the specimen directly to the laboratory while the specimen is still warm. If a delay is necessary, place about 0.5 to 1 teaspoon of specimen into each fixative provided.
- 4.4.3.5 Specimen Transport: If the specimen is not delivered immediately for bacterial culture, refrigerate it. If the specimen is to be submitted for *C. difficile* study and a 48 hr or more delay is anticipated, freeze the specimen or submit it quickly at 4°C. Submit fresh specimens for parasite studies as quickly as possible. Preserved specimens need not be rushed to the laboratory.

- 4.4.4 Comments: The laboratory must be notified if bacteria other than *Salmonella*, *Shigella* or *Campylobacter* spp. are suspected as the cause of diarrhea. Isolation of *Vibrio*, *Yersinia*, or *E. coli* 0157:H7 requires special procedures and are referred to an outside facility. Susceptibility studies are not routinely done on *Campylobacter* isolates. Anaerobic studies are not performed on feces. Transport bile, colostomy, and ileostomy specimens in the same manner as other fecal specimens.

### 4.5 Respiratory Specimens – Upper Tract

- 4.5.1 These infections are subdivided into pharyngitis, laryngitis, epiglottitis, and sinusitis. Each infection is characteristically caused by certain organisms that dictate specific requirements for the collection and transport of specimens.
- 4.5.2 **Pharyngitis**
  - 4.5.2.1 Acute cases may yield beta-hemolytic *Streptococci* by culture or group A streptococci only by direct antigen detection.
  - 4.5.2.2 Culture for *N. gonorrhoeae* is not a routine request. Indicate this special request on the requisition. This organism will die at refrigerator temperature. Gram stains cannot be used for identification of this organism from throat specimens.
  - 4.5.2.3 *Bordetella pertussis* is a fragile organism requiring immediate culture. The specimen of choice is mucus from the posterior nasopharynx. A special transport medium must be ordered and used. Contact laboratory. Respiratory therapy personnel may assist with obtain nasopharyngeal washings.
  - 4.5.2.4 Collect specimens for *Corynebacterium diphtheriae* testing by swabbing the posterior nares. Also sample the posterior pharynx. Use a routine transport medium.
  - 4.5.2.5 For viral agents, sample the throat with a swab or obtain nasal washings. Submit the specimen in viral transport medium.
- 4.5.3 **Laryngitis:** This infection is primarily caused by viruses such as parainfluenzae virus, respiratory syncytial virus (RSV), and adenovirus. If necessary for diagnosis, sample the throat with a swab or obtain nasal washings. Submit the specimen in viral transport medium.
- 4.5.4 **Epiglottitis:** Culture of the throat is not indicated. Touching the inflamed epiglottis may precipitate complete obstruction of the airway. The specimen of choice is blood culture.

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**4.5.5 Sinusitis:** The specimen of choice is a needle aspirate of the sinuses obtained after decontamination of the nasal cavity. Do not submit a swab. No specimen other than an aspirate is recommended.

**4.6 Respiratory Specimens – Lower Tract:** Careful specimen collection is important, because it is easy to contaminate the specimen with oropharyngeal flora, thus making the results clinically irrelevant. Multiple tests cannot be performed on small-volume specimens such as aspirates or biopsy samples. Specimen quality is judged microscopically. A properly collected specimen containing a minimum of squamous epithelial cells and significant numbers of polymorphonuclear leukocytes will probably provide clinically relevant results. Specimens of lesser quality will provide misleading results. Anaerobic studies of sputum are not performed. Direct testing using DNA probes may be available. Check with the laboratory about other rapid or molecular tests that may be available. Specimen Transport of Respiratory samples: Do not refrigerate respiratory specimens. Transport the specimens to the laboratory as soon as possible.

**4.6.1 Specimen Collection Material:** Sterile, screw-cap sputum collection cup.

**4.6.2 Method:**

**4.6.2.1** Explain to patient the difference between sputum and saliva. Explain that a deep cough first thing in the morning is needed to produce a sputum sample.

**4.6.2.2** Have patient rinse mouth with water. For patients with dentures, remove these first.

**4.6.2.3** Collect specimen directly into the container.

**4.6.2.4** Replace cap carefully and tightly. Be careful not to cross thread the lid, because leakage can occur, leading to a contaminated sample that will have to be discarded. Check the top to ensure that it is secure.

**4.6.3 Bronchoscopy- Bronchial Washings**

**4.6.3.1** Collect the specimen via bronchoscope. Directly sample the lower respiratory tract. Bronchial brushings are preferable to washings, because the washings are more dilute.

**4.6.3.2** Specimen Collection Materials: Lukens trap or other suitable specimen collection container.

**4.6.3.3** Method: To be collected by physician or respiratory therapy personnel.

**4.6.4 Transtracheal Aspirates:** Obtain lung fluid specimen using a sterile tracheal catheter.

**4.6.4.1** Specimen Collection Materials: Sterile tracheal catheter, mucous trap.

**4.6.4.2** Method: Only a physician or respiratory therapy personnel may collect the specimen.

**4.6.5 Throat Specimens**

**4.6.5.1** Obtain the specimen by vigorously swabbing tonsillar areas, the posterior pharynx and any areas of inflammation, ulceration, exudation or capsule formation.

**4.6.5.2** Specimen Collection Materials: Dacron, cotton or calcium alginate swab.

**4.6.6 Nasal Specimens**

**4.6.6.1** Obtain the specimen by swabbing the anterior nasal mucosa of both nares for three seconds each.

**4.6.6.2** Specimen Collection Materials: Sterile swab transport media.

**4.6.7 Nasopharyngeal Specimens**

**4.6.7.1** Obtain specimen by accessing posterior nasopharynx via the nose.

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### 4.6.7.2 Specimen Collection

**4.6.7.3 Nasopharynx swab:** Gently insert a small swab (e.g., calcium alginate) into the nasopharynx, just to the point of resistance. Rotate the swab slowly for 5 seconds to absorb secretions.

**4.6.7.4 Nasopharynx wash:** Bulb Method – Suction 3-5 mL saline into a sterile bulb. Insert the bulb into one nostril until the nostril is occluded. Squeeze the bulb to push the saline into the nostril. Immediately release the bulb and collect the nasal specimen. Empty the bulb into a dry sterile container. Syringe Method – Fill a 10 mL syringe with saline and attach tubing to syringe tip. Push 3-5 mL saline into the nostril. Aspirate nasal specimen or allow patient to tilt head forward in order for the specimen to drain into a dry, sterile container.

## 4.7 Genital Specimens

**4.7.1** A cervical specimen is the specimen of choice for the diagnosis of gonorrhea and chlamydia in adolescent and adult females.

### 4.7.1.1 Cervical Specimen Collection

**4.7.1.1.1** If applicable, remove mucus from the area with cotton ball.

**4.7.1.1.2** Insert a speculum moistened with warm water.

**4.7.1.1.3** Note: lubricants may contain antibacterial agents.

**4.7.1.1.4** Insert a small-tipped Dacron swab approximately 2 cm into the cervical canal.

**4.7.1.1.5** Rotate and move swab from side to side for 30 seconds.

**4.7.1.1.6** Withdraw swab carefully to avoid any contact with vaginal mucosa.

**4.7.1.1.7** Swab of Bartholin gland exudates are not recommended, as normal vaginal flora is impossible to exclude. Bartholin glands should be aspirated with a needle and syringe after careful skin preparation.

**4.7.1.1.8** Transport in sterile swab media at room temperature.

### 4.7.2 Urethral and Penile Specimens

**4.7.2.1** Patient should not have urinated for at least one hour prior to sampling.

**4.7.2.2** Insert a small swab 2-4 cm into urethra.

**4.7.2.3** Rotate clockwise for 2-3 second to endure contact with all urethral surfaces and withdraw swab.

## 4.8 Fungal Specimens

**4.8.1** Specimen Collection Notes: Specimens for fungal culture (with one exception) should NOT be collected with a swab because of potential interference of the swab fibers with direct microscopic examination of the specimen.

**4.8.2** Swabs are acceptable for use for the collection of specimens with suspected yeast infections only.

**4.8.3** Containers must be sterile (screw-capped containers for collection of urine or sputum specimens).

**4.8.4** Biopsies and tissue specimens can also be placed into these sterile cups. To keep them moist, one may add a small amount of non-bacteriostatic saline to the cup rather than wrapping smaller tissue samples in gauze.

**4.8.5** Sterile Petri dishes may be used to transport hair, skin and nails to the mycology laboratory.

**4.9 AFB (Acid-Fast Bacilli) Specimens:** Acid-fast bacilli may infect almost any tissue or organ of the body. Sputum produced spontaneously is the specimen of choice. Other acceptable specimens include aerosol-induced sputum, bronchoscopic aspirations and gastric lavage.

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- 4.9.1** Gastric Wash or Lavage for Mycobacteria.
- 4.9.2** Collect in early morning before patients eat and during the time patients are still in bed.
- 4.9.3** Introduce a nasogastric tube into the stomach.
- 4.9.4** Perform lavage using 25-30 mL chilled, sterile distilled water.
- 4.9.5** Recover sample and place into a leak-proof, sterile container.
  
- 4.9.6 Lower Respiratory, Bronchoalveolar Lavage, Brush or Wash, Endotracheal Aspirate**
  - 4.9.6.1** Collect washing or aspirate in a sputum trap.
  - 4.9.6.2** Place a brush in a sterile container with 1 mL of saline.
  
- 4.9.7 Expectorated Sputum**
  - 4.9.7.1** Collect specimen under the direct supervision of a nurse or physician.
  - 4.9.7.2** Have patient rinse or gargle with water to remove excess oral flora.
  - 4.9.7.3** Instruct patient to cough deeply to produce lower respiratory specimen (not postnasal fluid).
  - 4.9.7.4** Collect in a sterile container.
- 4.9.8 Induced Sputum**
  - 4.9.8.1** Have patient rinse mouth with water after brushing gums and tongue.
  - 4.9.8.2** With the aid of a nebulizer, have patient inhale approximately 25 mL 3-10% saline.
  - 4.9.8.3** Collect specimen in a sterile container.
  
- 4.10 Tissue**
  - 4.10.1** This is obtained during surgery or during a cutaneous biopsy procedure.
  - 4.10.2** Add several drops of sterile saline to keep small pieces of tissue moist.

### 5.0 Proper Handling of Tissue/Pathology Specimens:

**5.1 General Policy:** When a physician requests a tissue and/or body fluid ("specimen") examination, it is important to carefully place the specimen into an appropriate container with an appropriate fixative solution added, if required. The Pathology Requisition Form must be filled out completely, i.e. information provided to identify the specimen, the service or test(s) requested, accompanied by pertinent clinical information and physician contact information. Nurses must document verbal confirmation of orders by physicians, i.e., specific tissues submitted for testing and specific tests to be performed for each specimen. When dropping off specimens, record the delivery date/time and the specimen information into the Histology Log Book, accompanied by the signature of the person delivering the specimen(s). If the physician requests cultures to be performed on samples, deliver specimens fresh to the Microbiology Lab. The specimen may then be forwarded to the Histology Lab for processing. If no cultures are needed, send specimen immediately to Histology Lab. If a delay in processing of the body fluid is anticipated (i.e., >12 hours), then add 70% alcohol to the specimen. If the specimen is tissue, place in 10% neutral buffered formalin. NOTE: Do not place specimen on bench top in the Pathology Lab without notifying the Laboratory Technologist. Patient specimens (including foreign bodies and implants) requested to be returned to a patient or physician can be released by the laboratory only after verification and appropriate documentation.

### 5.2 Tissue Specimens

## Collection, Preparation and Handling of Lab Specimens

- 5.2.1** If the physician requires immediate evaluation by the pathologist, deliver the specimen fresh to the pathology laboratory. If immediate evaluation is not required, immediately add formalin to the surgical tissue specimen, or 70% alcohol to body fluids (except CSF).
- 5.2.2** NOTE: Formalin is a biohazardous material. Avoid contact with skin or inhalation of fumes. Prevent spills by handling both specimen and formalin with care. Clean up any spill immediately and wash well if skin contact occurs. Eye contact requires immediate flushing with copious amounts of water.
- 5.2.3** Upon receipt of the tissue specimen, the nurse will place it in the appropriate container.
- 5.2.4** Add formalin to the container (using a ratio of formalin: tissue of at least 4:1, preferably 10:1). If this is not possible, immerse specimen in formalin.
- 5.2.5** Seal the container well. Invert to check for leaks.

### 5.3 Cytology Specimens

#### 5.3.1 Cervicovaginal Pap Smear

- 5.3.1.1** Specimen is obtained using a vaginal speculum. Moistened with water.
- 5.3.1.2** Read instruction provided on specimen collection kit, including materials required for obtaining a smear.
- 5.3.1.3** NOTE: Fixation is important prior to drying of the collected specimen.

#### 5.3.2 Respiratory System Specimens

- 5.3.2.1** Appropriate collection bottles are provided and should be used only for cytopathologic examination of sputum.
- 5.3.2.2** The nursing staff will obtain these specimens and bring them to the lab.
- 5.3.2.3** Bronchial brushings may be either air-dried and/or alcohol-fixed after preparation.
- 5.3.2.4** Submit these fluids to the laboratory immediately following removal to ensure adequate processing before cellular degeneration occurs. If delay is unavoidable, part of the fluid should be mixed with an equal volume of 70% alcohol for preservation of cytologic detail.

### 5.4 "Gross Only" Tissue

- 5.4.1** The following represents a list considered appropriate for "Gross Only" evaluation. The pathologist has the option of submitting tissue if it is considered that a significant disease process may be present by gross exam and/or clinical history.
  - 5.4.1.1** Inguinal hernia tissue
  - 5.4.1.2** Foreskin (newborns and patients >15 years of age)
  - 5.4.1.3** Surgical/Medical hardware
  - 5.4.1.4** Traumatic amputations
  - 5.4.1.5** Teeth knocked out in error
  - 5.4.1.6** Rib or other bone/soft tissue removed to enhance operative exposure
  - 5.4.1.7** Nasal septal contents

**5.5 Material Not Requiring Pathology Evaluation:** Cataracts, teeth, excess skin from facial surgery, therapeutic radioactive sources requiring validation safety monitoring, foreskins (<15 years of age, except newborns), skin scars, ribs removed for exposure, normal adipose tissue (NOT breast tissue) for reduction, urinary calculi, access catheter devices, dental appliances/restorations, and stents.

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### 5.6 Placenta Specimens

**5.6.1** Do NOT add formalin to placenta or product of conception specimens.

#### 5.6.2 Maternal Indication for Consideration of Placental Microscopic Examination

**5.6.2.1** Systemic disorders (severe diabetes, impaired glucose metabolism, hypertensive disorders, collagen disease, seizures, severe anemia (i.e., <9 g), premature delivery (i.e., ≤ 34 weeks gestation), gestational age (i.e., ≥ 42 weeks), peripartum fever and/or infection, unexplained third trimester bleeding or excessive bleeding (i.e., >500 mL), clinical concern for infection during pregnancy, severe oligohydramnios/polyhydramnios, history of substance abuse, maternal trauma, prolonged (i.e., >24 hours) rupture of membranes, unexplained or recurrent pregnancy, abruption, thick and/or viscid meconium

#### 5.6.3 Fetal/Neonatal Indication for Consideration of Placental Microscopic Examination

**5.6.3.1** Admission or transfer to other than Level 1 Nursery, Stillbirth or perinatal death, Compromised clinical condition: Cord Blood pH <7.0; apgar score ≤ 6 at 5 minutes; ventilator assistance >10 minutes; severe anemia (hematocrit <35%), Hydrops fetalis, Small for gestational age, Seizure, Infection or sepsis, Major congenital anomalies, Discordant twin growth (i.e., >20% weight difference), Multiple gestation with same sex infants and fused placentas.

#### 5.6.4 Placental Indication for Consideration of Microscopic Examination

**5.6.4.1** Physical abnormality; infarct, mass, vascular thrombosis, retro-placental hematoma, amnion nodosum, abnormal coloration or opacification, malodor., Small or large placental size or weight for gestational age.

#### 5.6.5 Procedure for Placental Specimens

**5.6.5.1** Process placenta specimen according to directives of pathologist and IAW hospital policy and procedure.

**5.6.5.2** Placentas that meet indications for further examination should have any clinically indicated studies requiring fresh tissue done prior to fixation, following which they should be handled as any other surgical specimens.

**5.6.5.3** Placentas not submitted for detailed examination (i.e., routine) should be stored in individual containers and refrigerated in the fresh state at 4°C for at least 3 days.

**5.6.5.4** Placentas not requested for further examination will be discarded after 3 days according to lab procedure.

### 5.7 Limbs

**5.7.1** Formalin is not required when submitting an above-the-knee, below-the-knee or arm amputation.

**5.7.2** Place these specimens fresh in biohazard bags.

**5.7.3** Transport specimens to the histology lab immediately for storage in the refrigerator.