

# Reference Material—Huntsville Hospital Health System Laboratory

## Histology-Cytology Section

### Tissue Specimens

#### A. ORDERING PATHOLOGY EXAMINATIONS FOR TISSUE SPECIMENS FROM HH HEALTH SYSTEMS

All tissue specimens removed in surgery or elsewhere in the hospital must be brought to the laboratory and clocked in upon receipt in Histology Department. All such specimens are examined by a pathologist and most are sectioned and examined under the microscope. Specimen containers must be properly labeled and submitted with a computer generated “Pathology Request” completed with patient information including patient name, hospital number, age, sex, date of birth, physician submitting specimen, date and time specimen obtained, the specimen contents, source, and clinical history. All information must be **complete** and **legible**.

#### B. SMALL TISSUE SPECIMENS

Small specimen bottles containing 10% formalin are kept in the Histology Department. These are suitable for small biopsy specimens, such as skin biopsies, cervical biopsies, needle biopsies of the liver, etc. They should be obtained before the specimen is taken in order to prevent drying of the specimen or loss of small specimens. A computer generated “Pathology Request” must be filled out and submitted with such specimens.

Larger specimens, such as tissue from incomplete abortion, will require larger containers and the specimen should be completely covered with formalin. The specimens should be brought to the Histology Department of the Laboratory.

**Note: Specimens placed in formalin in a screw top container may be sent through the tube system.**

#### C. DISPOSITION OF FETUS

The specimen should be placed in 10% formalin and sent to the Histology Department. A signed permit for disposal of the fetus must accompany the regular “Pathology Requisition.” Should the gestational age of the fetus be in question the pathologist may be contacted for instruction.

#### D. SPECIMENS SAVED FOR PATIENT

Occasionally patients ask to see gallstones, kidney stones, etc. If the Histology Department is informed of the patient’s wishes the specimen will be saved for approximately 2 weeks and may be obtained from that department.

#### E. KIDNEY OR URETERAL STONES

Chemical analysis may be ordered on kidney or ureteral stones. Place order via HIS for stone analysis. Bring specimen transmittal and properly labeled specimen to the Central Processing Department in the laboratory.

### Surgical Specimens

#### A. ROUTINE SPECIMENS

Specimens must be placed in a container with formalin and labeled with patient’s name, hospital number, date, surgeon, and specimen. The surgeon should identify the specimen. NEVER label the specimen container before the specimen is obtained. The computer generated “Pathology Sheet” will include the appropriate patient information including patient name, hospital number, age, sex, date of birth, as well as physician submitting specimen, date and time specimen obtained, specimen and source, and clinical history. “Pathology Sheet” must be **complete** and **legible**. Specimens may be sent in the tube system provided they are in a screw top container and the container fits in the tube; otherwise all departments are to bring specimens to the Histology Department. All special stains and immunoperoxidase techniques will be performed after consultation with a pathologist.

## B. FROZEN SECTIONS

A properly labeled specimen and "Pathology Sheet" is taken directly by surgery personnel to the pathologist or histotechnologist in the Histology Department. All frozen specimens must be clocked in and initialed by the person bringing the specimen.

**Specimens must be delivered to the Laboratory Supervisor after hours. NEVER leave a specimen unattended. Pathologist must be paged for all Frozen Sections.**

## C. HANDLING OF BULLETS

All bullets removed should be taken directly to Pathology and handled by as few people as possible. The bullet should be handed directly to the pathologist or technician in his absence. (If problems are encountered contact the Pathologist on call.) The "Pathology Sheet" must be completed and accompany the bullet to the laboratory. The person carrying the bullet to the laboratory and the person receiving the bullet must sign and clock in the "Pathology Sheet."

## D. LYMPH NODE BIOPSY

1. All lymph node biopsies (posted as such on the operating room schedule) should be sent in a fresh, unfixed state to the laboratory and handed to the pathologist or histotechnologist as soon as possible after removal. All specimens must be initialed and clocked in by the person bringing the specimen.
2. These lymph nodes should be **fresh, non-fixed**, and in **sterile containers**. Cultures may be requested by the surgeon or by the pathologist at his/her discretion.
3. If a frozen section is requested on this tissue, this must be communicated separately.
4. This procedure is necessary to allow special studies on these lymph node specimens which are not possible after routine formalin fixation.

**Note: A copy of the physical and history from the patient's chart must be submitted with the following biopsy specimens to the Histology Department.**

## E. NERVE BIOPSY

The Division of Pathology insists that the following guidelines be utilized due to the specialized procedures and techniques needed to handle nerve biopsies.

1. Nerve biopsies should only be done Monday through Thursday, and before 1 p.m. Nerve biopsies should not be done on Fridays as they can only spend a limited amount of time in the fixative and detailed studies should begin within 24 hours following the biopsy. Since most of these are referred to outside laboratories, it becomes logistically impossible to properly handle them on Friday.
2. The Histology Department (phone #8090) should be notified at least 24 hours in advance of scheduling nerve biopsies.
3. The specimen should be placed on a saline soaked gauze or telfa pad. A copy of the patient's History & Physical must accompany the specimen.
4. Not performed at Madison Hospital.

## F. RENAL BIOPSY

1. Specimen should be placed in a container on a saline soaked gauze or telfa pad.
2. Specimens should be submitted immediately to the Histology Department. **Always give specimen to Histology Technologist, Pathologist, or Laboratory Supervisor.**
3. Not performed at Madison Hospital.

## G. MUSCLE BIOPSIES FOR ENZYMATIC STUDIES

1. All muscle biopsies should be scheduled with the Histology Department (phone #8090) at least 1 day in advance. Muscle biopsies should be scheduled on Monday through Wednesday before 2:00 p.m.
2. The muscle should be maintained on gauze or telfa pad.
3. Specimens should be submitted immediately to the Histology Department with patient history and physical. **Always give specimen to Histology Technologist, Pathologist, or Laboratory Supervisor.**
4. Not performed at Madison Hospital.

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## Collection and Ordering Procedures for Cytology Examinations

Requests for cytology examinations, PAP smears, etc., should be ordered via HIS through the microbiology pathway. Appropriate specimen type may be selected or typed in and the test requested selected. When the specimen is statused as “collected” a “Cytology Requisition” will print. Bring the completed “Cytology Requisition” and the properly labeled specimen to the laboratory.

**Note:** Specimens that are deemed unacceptable are as follows: unlabeled or broken slides, improper collection technique, unlabeled specimen, mislabeled specimen, or incomplete requisition. The submitting physician will be notified if patient is an outpatient. The nurse caring for the patient will be notified for inpatient.

### A. COLLECTION OF GYNECOLOGICAL MATERIAL

All specimens for gynecological testing must be collected in ThinPrep® collection solution. Container must be labeled with patient label. Order cytology PAP smear in HIS using the microbiology pathway. Cytology requisition must be completed noting any information regarding pregnancy, post partum, LMP, hormone therapy, or previous gynecological surgery. Submit to the specimen processing area of the laboratory.

### B. NEEDLE ASPIRATIONS

Specimens must be properly labeled. All FNA’s on outpatients not done by Radiology are to be scheduled through Pathology Associates (256-533-1480) during routine hours Monday through Friday 8 a.m. to 4:30 p.m. All FNA’s on inpatients not done by Radiology are to be scheduled through the Pathology Department (ext. 8087) Monday through Friday 8 a.m. to 4:30 p.m.

### C. COLLECTION OF NON-GYNECOLOGICAL MATERIAL

Proper collection of material for cytologic analysis is the first step toward satisfactory results. An important factor, often overlooked, is to provide adequate basic information. This information should not only include the source of the specimen, but the patient’s name, age, sex, and clinical impression with diagnosed or suspected neoplasm. The lack of this information causes a delay in submitting the report.

1. **BARR BODIES:** The best specimens are usually obtained by scraping the inside of the cheek close to the gum with a small **metal** spatula. The material is spread uniformly on a glass slide which has been cleaned with alcohol prior to making the scraping. The smear should be **fixed immediately** with cytology fixative. Slides must be labeled with the patient’s name. Unlabeled slides will not be accepted. Submit with completed “Cytology Requisition.”
2. **BODY FLUIDS:** Body fluids should be collected in a clean container which should contain a heparin solution. One milliliter or one thousand units of heparin per hundred milliliters of expected fluid may be added to the container prior to collection. Heparin will inhibit coagulation of the specimens. The specimens should be submitted to the laboratory with a “Cytology Requisition” immediately after collection.
3. **BREAST ASPIRATION (CYST FLUID):** Fluid aspirated from the breast should be submitted to the laboratory immediately, and may be sent in the collecting syringe or a clean, stoppered tube. A completed “Cytology Requisition” is required.
4. **BREAST SMEARS (NIPPLE DISCHARGE):** Immediate fixation is mandatory when making smears from nipple secretions. Seconds delay may make a big difference in cellular preservation. A clean, glass slide may be touched directly to the nipple and drawn across to make the smear. The cytology fixative to be used should be located where it can be used immediately after making the smear. Slides must be labeled with the patient’s name and date of birth. Unlabeled slides will not be accepted. Submit with a completed “Cytology Requisition.”
5. **BRONCHIAL BRUSHINGS:** Smears will be made onsite from the brush. It is best not to make more than 2 smears from each brush, and the smears should be fixed with cytology fixed immediately. Brush smears are usually very thin and the cellular material dries rapidly, causing distortion. The brush should be placed in a clean, stoppered tube or cup containing

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several milliliters of saline. The smears and tube, with the brush, should be labeled and sent with the proper request to the Histology Department. Slides must be labeled with the patient's name and date of birth. Unlabeled slides will not be accepted. Submit with a completed "Cytology Requisition."

6. **BRONCHIAL WASHINGS:** Bronchial washings are obtained by using small amounts of saline injected through a bronchoscope, then aspirating and collecting the material. Each tube should be labeled as to anatomic site and sent with a completed "Cytology Requisition" to the laboratory immediately.
7. **MATURATION INDEX:** Smears should be labeled for Maturation Index and obtained from the lateral vaginal wall and fixed the same as a routine gynecological smear. Cervical scrapings do not render accurate maturation counts. Slides must be labeled with the patient's name and date of birth. Unlabeled slides will not be accepted. Submit with a completed "Cytology Requisition."
8. **SPINAL FLUID:** As large a volume as possible should be collected, at least 3 mL to 5 mL. The collected fluid should be submitted to the laboratory immediately with a completed "Cytology Requisition."
9. **SPUTUM:** The patient must be informed that a "deep cough" specimen is the only material that should be submitted. If the patient cannot produce a deep cough specimen, then no material should be submitted, as it will be unsatisfactory. It will contain no bronchial epithelium. Usually deep cough specimens are obtained when first arising in the morning. The specimen should be collected in a clean container and submitted immediately after collection to the Histology Department, with a completed "Cytology Requisition."
10. **URINE:** The first-voided urine in the morning should be collected in a clear container and submitted immediately to the laboratory. Urine for cytomegalic inclusion bodies should be collected in the same manner. Submit with a completed "Cytology Requisition."

**Note:** As stated before, proper collection of material is the first step for satisfactory cytology. The next step is proper preparation of the material. It is therefore very important that the collected specimens are taken care of immediately. Personnel must be available in the laboratory to process the specimens. Therefore, late afternoons, evenings, weekends, and holidays are usually poor times to collect specimens for cytology. If specimens are obtained at these times, direct contact with laboratory personnel (to insure proper handling of specimens) is mandatory. The specimen must be given to a technologist and not left in the department.

## Blood Bank Section

### Requesting Blood and Blood Products

#### PURPOSE:

To make blood or blood components available for possible transfusion to patients.

#### HUNTSVILLE HOSPITAL HEALTH SYSTEM LABORATORY POLICY:

No blood or blood components will be available for transfusion without written orders.

#### PROCEDURE:

##### A. Patient Information

###### 1. Patient Identification:

- a. Last name, first name, middle initial
- b. Hospital number
- c. Date of birth
- d. Room number or location
- e. Patient's physician

###### 2. Requesting physician, date and time

###### 3. Diagnosis

##### B. Crossmatch Priority

###### 1. Emergency—Uncrossmatched

###### 2. STAT—Crossmatched

###### 3. Routine: Date and time

###### 4. Surgery: Date and time

###### 5. Type and Screen (ABO, Rh, Antibody Screen—no blood will be crossmatched)

- a. STAT (type and screen)
- b. Routine (type and screen)
- c. Surgery (type and screen)

##### C. Product Quantity Requested (Check Product Requested and Quantity Needed)

###### 1. WRBCs (WRBC)

- a. Washed cells are obtained from our blood supplier. Minimum time of arrival is 3 hours and could take up to 24 hours. The requested units will be crossmatched upon receipt.
- b. WRBCs expire in 24 hours.

###### 2. Pediatric cytomegalovirus (CMV)-negative packed cells

- a. CMV-negative packed cells are split into aliquots for pediatric transfusion.
- b. Crossmatches are ordered with the first transfusion if patient is less than 4 months old. A crossmatch is always required for each transfusion on pediatric patients >4 months old.

###### 3. Leuko-Poor Packed Cells

A filter may be issued if the units are not pre-storage leuko-depleted.

The following procedures with the exception of Leukopheresis, do not require a crossmatch.

###### 4. Pheresed Products: These products are prepared by centrifugal separation of whole blood from a single donor.

- a. Platelet Pheresis: This product is roughly equivalent to 6 to 8 units. These products have a 5 day expiration date.
- b. Leukopheresis: This product has a maximum yield of leukocytes and a moderate yield of platelets.

- 1) Notify the Blood Bank at 256-265-8054 of the physician's orders indicating the duration of the request (i.e, standing order, daily, every other day, etc.). Enter order into computer. Pheresed leukocytes are ordered from our blood supplier. This product has a 24 hour expiration time.

**Note:** Whenever orders for pheresed products are canceled, notify the Blood Bank at Huntsville Hospital Laboratory at 256-265-8054 or Madison Hospital Laboratory at 256-265-5146 immediately.

- 5. Pre-Pooled Platelet Concentrates
  - a. This product is ordered from our blood supplier.
  - b. A platelet concentrate expires within 5 days of the date and time of collection.
  - c. The units are to be ordered individually.
  - d. Platelet concentrates require a blood component recipient set which is issued by the Blood Bank.
- 6. Fresh Frozen Plasma (FFP)
  - a. Plasma must be thawed; therefore, allow 30 to 45 minutes notice for thawing before transfusing.
  - b. Thawed FFP should be transfused within 24 hours after being thawed since coagulation factors deteriorate.
  - c. Thawed FFP expires 5 days after being thawed. This product is used for adult transfusion. Pediatric and neonatal patients cannot receive thawed FFP.
- 7. Cryoprecipitate
  - a. Notify the Blood Bank at Huntsville Hospital Laboratory (256-265-8054) or Madison Hospital Laboratory (256-265-5146) 30 minutes prior to issuing.
  - b. Pooled cryoprecipitate expires 4 hours after preparation. (A special infusion set will be issued with the product by the Blood Bank.)
- D. Reserved Units (“Units Will Be Held Through”)
  - 1. Whole blood and packed red blood cells are held for the patient at least 24 hours and up to a maximum of 2 days after the time of intended use.
  - 2. Emergencies may occur, making it necessary to release crossmatched blood before the date indicated on the requisition. The nursing unit will be notified of this decision.
- E. “On Hold Units”

These units must be continually updated by the floor. The Blood Bank cannot initiate requests and is not responsible to keep blood on hold at all times.

To Check Out Blood—See “Nursing Procedure Manual”

For Transfusion Of Blood—See “Nursing Procedure Manual”

## **Returning Blood to Blood Bank**

### PURPOSE:

Return unused blood (unit not entered) to the Blood Bank. Call Blood Bank if the product can not be transfused.

### HUNTSVILLE HOSPITAL HEALTH SYSTEM LABORATORY POLICY:

Blood that cannot be transfused to a patient must be returned to the Blood Bank. Units that are returned to the Blood Bank with a temperature of less than or equal to 10<sup>0</sup> C can be reissued. The blood must be stored under controlled conditions at 1° C to 6° C and continuously monitored. The refrigerators on the floors do **not** meet these requirements.

### PROCEDURE:

1. The authorized personnel upon returning the unit of blood notifies a Blood Bank technologist.
2. The technologist changes the status of the unit in the Blood Bank computer system and then returns the blood to the refrigerator.

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## **Transfusion Reactions**

### PURPOSE:

To report any unfavorable event occurring in a patient during or following transfusion of blood products that can be related to that transfusion.

### HUNTSVILLE HOSPITAL HEALTH SYSTEM LABORATORY POLICY:

All transfusion reactions should be reported to the Blood Bank and evaluated to the extent considered appropriate by its Medical Director.

### PROCEDURES:

1. Stop the transfusion.
2. Notify the attending physician. Notify the Blood Bank at Huntsville Hospital Laboratory (256-265-8054) or Madison Hospital Laboratory (256-265-5146) immediately.
3. The nurse will bring the remainder of the unit with the attached recipient set to the Blood Bank and complete a "Transfusion Reaction Workup Form" (available in the Blood Bank).
4. The Blood Bank personnel will initiate all specimens to be collected by a phlebotomist. This will be done immediately.
5. When available, the first voided urine should be sent to the Blood Bank for urinalysis.
6. If any discrepancies are discovered in the workup, the nursing unit and physician will be notified.

## **RhIG Evaluation**

### PURPOSE:

To determine if Rh negative women are RhIG candidates in order to prevent Anti-Rho (D) production.

### HUNTSVILLE HOSPITAL HEALTH SYSTEM LABORATORY POLICY:

All Rh negative women who deliver Rh positive infants or Rh negative women who have a miscarriage or abortion are evaluated for RhIG.

### PROCEDURE:

1. Order the RhIG prior to delivery.
2. The request will be held for evaluation until the cord blood workup is complete.
3. If the infant is Rh positive, a post partum blood specimen will be drawn the following morning.
4. The RhIG evaluation will be performed and the results sent to the floor.
5. A patient refusing RhIG for any reason must sign a release form but will still be charged for the RhIG evaluation, but not the RhIG.
6. RhIG must be injected intermuscular or intravenous within 72 hours of delivery.

## **Cord Blood—Hemolytic Disease of the Newborn (HDN)**

### PURPOSE:

To detect HDN.

### HUNTSVILLE HOSPITAL HEALTH SYSTEM LABORATORY POLICY:

Cord blood specimens of infants delivered to all Rh negative women and Group O women regardless of Rh type are evaluated for the diagnosis of HDN.

### PROCEDURE:

1. Order and Status when the specimen is drawn.
2. Send transmittal slip with the anticoagulated specimen (mix gently but well to prevent clotting) and the clotted specimen to the Blood Bank.
3. Blood Bank performs ABO, Rh, and Direct Coombs.
4. The Blood Bank will initiate other tests to determine the cause of the HDN.
  - a. Indirect Coombs on the cord serum
  - b. Elution of cord blood
  - c. Tests on mother if indicated (the Blood Bank will call the floor for these requests to be sent down)

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## Microbiology Section

Useful results on specimens submitted for microbiological studies are contingent on the quality of the specimen received. Failure to isolate infectious microorganisms is frequently the result of improper collection technique, delay in specimen delivery to the laboratory, or delay in processing of specimens. Compromised specimens can lead to results that may actually indicate an overgrowth of contaminants or normal flora. Conversely, causative microorganisms may not survive at all. These situations can lead to the improper treatment of patients. It is, therefore, important that persons involved in specimen collection understand the requirements for proper collection, transport, and storage as described in this section.

### Types of Cultures

#### A. ROUTINE CULTURE

Specimens for routine culture are screened for a wide variety of aerobic bacteria and, when ordered or as the specimen source or collection method dictates, anaerobic bacteria. In sites that contain indigenous flora, the culture is examined for potential pathogens. When a pathogen is not identified, normal flora is reported. Sensitivities are performed routinely based on the identification of the isolate and source of the specimen. A Gram stain is included with most routine culture orders. Examples of specimens that do not routinely include a Gram stain are urine, upper respiratory (nasopharyngeal/nasal), throat, stool, routine female genital (including Group B Streptococcus orders), catheter tips, and bone marrow.

#### B. FUNGUS CULTURE

Specimens for fungus culture are screened for yeasts, molds, and, when isolated, modified acid-fast bacteria (eg, *Nocardia* species). Extent of identification of isolate is determined by specimen source and collection method. Sensitivities are not performed on yeasts and molds. When sensitivities are required, contact the Microbiology Department. A fungal prep/fungal stain is not routinely included with the fungus culture order, and, therefore, must be ordered additionally when needed.

#### C. MYCOBACTERIA/ACID-FAST BACILLI (AFB) CULTURE

Specimens for AFB culture are screened for AFB and, when isolated, modified acid-fast bacteria (eg, *Nocardia* species). Specimens containing normal bacterial flora (eg, respiratory specimens) are concentrated and decontaminated prior to culturing. Sensitivities are performed by a reference laboratory. Sensitivities are routinely only performed on *Mycobacterium tuberculosis* complex and *Mycobacterium kansasii* isolates. An AFB stain is included with most AFB culture orders.

#### D. VIRUS CULTURE

Specimens for virus culture are forwarded to Mayo Medical Laboratories. Special transport media is not required for most routine virus culture orders.

### Ordering of Microbiology Tests

#### A. HOSPITAL PATIENTS

Microbiology tests should be ordered via the Clinical Information System computer. The majority of tests are accessed through the Microbiology pathway and/or non-blood pathway. Select the appropriate specimen type, collection method (when necessary), and test(s) requested.

#### B. OUTREACH CLIENT'S PATIENTS

Microbiology tests are usually ordered using the furnished order form. Note the specimen source and method of collection.

### General Information on Specimen Collection and Transport Requirements

- Follow Standard Precautions with all specimens.
- Whenever possible, specimens should be obtained before antimicrobics have been administered.
- Collect enough specimen for the test(s) ordered.

- So that the specimen will be representative of the infected site, collect with as little contamination from “normal” flora. If specimen is to be collected through intact skin, proper disinfection of the skin is essential. This can usually be accomplished by wiping site with 70% alcohol followed by an iodine solution (1-2% tincture of iodine or 10% solution of povidone-iodine). Insure the patient is not allergic to iodine. Remove iodine after specimen has been collected.
- Specimens must be collected in appropriate containers as specified in “Alphabetical Test Listing.” For the safety of all personnel, be sure that the outside surface of specimen container is **not** contaminated. Any specimen container with surface contamination may be rejected for requested testing.
- Specimens must be labeled minimally with patient’s full name and identifying number (hospital number, etc.). Specimens that are unlabeled, mislabeled, or improperly labeled may necessitate recollection. Additionally, it is advantageous to label specimen with source/specimen type and date and time of collection.
- For hospital patients, after specimen is collected, status as “collected” in the Clinical Information System computer to generate the specimen “Transmittal Sheet.” Sign the “Transmittal Sheet.” Properly labeled specimen and specimen “Transmittal Sheet” should be delivered to laboratory **as soon as possible**. Specimens should **not** be left on counter or placed in refrigerator in the Microbiology Department without notifying laboratory personnel of specimen arrival.
- For Outreach clients, see the “Alphabetical Test Listing” for transport/maximum storage requirements.

### Requests for Specific Organisms

When specific organisms/diseases are suspected or requested, call the Microbiology Department at 256-265-2171 for special instructions. These would include the following requests:

- *Actinomyces*
- *Bartonella*
- *Bordetella pertussis*
- *Brucella*
- *Chlamydia*
- Diphtheria
- *Leptospira*
- *Mycoplasma*
- *Nocardia*
- *Ureaplasma*
- *Vibrio*
- *Yersinia*

### Specimens Unacceptable for Anaerobic Culture

Because of the problem of contamination by normal flora, the following specimens should **not** be cultured for anaerobes:

- Sputum or bronchial washings (collect transtracheal aspirate for anaerobic cultures of the lower respiratory tract)
- Urine (do suprapubic aspiration of the bladder if anaerobic cultures of urine are desired and specifically request an anaerobic culture)
- Feces or any specimen containing fecal material
- Skin, superficial wound swabs, eyes, ears
- Vaginal secretions
- Cervical secretions
- Gastric washings
- Prostatic secretions
- Throat swabs

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## Specimens Collected Surgically or for Aerobic and Anaerobic Culture

- Specimens of tissue or aspirated pus are preferred for any type of culture but are particularly desirable for the recovery of anaerobic bacteria, mycobacteria, or fungi. A swab collection is the least desirable specimen for these cultures.
- These specimens should be transported immediately to laboratory in a sterile, leakproof container.
- When delay of specimen delivery to laboratory is expected, aerobic/anaerobic transport tubes should be utilized for specimens suspected of anaerobic infection. These tubes can be obtained upon request from the Microbiology Department. The use of these tubes is not necessary when specimens are delivered promptly (usually within 2 hours of collection) to the Microbiology Department.
- Open lung biopsies and lymph nodes are routinely cultured for aerobic and anaerobic bacteria, fungi, and mycobacteria. In addition, open lung biopsies are cultured for legionella and viruses. Additional orders or deletion of these orders may be made by a pathologist.

## Additional Charges

Charges may be added to cultures based on additional work performed. CPT codes for these tests are:

- 87015-concentration
- 87077-aerobic/urine organism identification
- 87076-anaerobic organism identification
- 87088-urine organism presumptive identification
- 87106-yeast identification
- 87107-mold identification
- 87147-streptococcal grouping, x5 (A,B,C,F,G)
- 87147-*Salmonella* grouping, x2 (two reagents used)
- 87147-O157 screen
- 87147-H7 screen
- 87149-identification by DNA probe
- 87176-tissue homogenization
- 87181-Etest sensitivity (each strip)
- 87184-disk sensitivity
- 87185-beta-lactamase
- 87186-MIC sensitivity

## References

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