

Department of Pathology and Laboratory Medicine

Test Handbook

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GENERAL INFORMATION

GENERAL LABORATORY HOURS

The laboratory is open 24-hour basis. Outpatient Lab hours are listed below.

Patient Service Centers

Central Georgia Diagnostics Outpatient Laboratory Services

746 Spring Street

Macon Georgia 31201

478-633-1234

Fax: 478-749-9115

Hours: Monday- Thursday 8:00 a.m. – 6:00 p.m.

Hours: Friday 8:00 a.m. – 5:30 p.m.

Hours: Saturday 8:00 a.m. – 12:30 p.m.

Central Georgia Diagnostics

1650 Hardeman Ave.

Macon, Ga. 31201

478-633-9100

Fax: 478-633-7021

Hours: Monday- Friday 8:00 a.m. – 5:00 p.m.

Central Georgia Diagnostics Northwest

5925 Zebulon Rd.

Macon, Ga. 31210

478-757-7877

Fax: 478-757-7876

Hours: Monday – Friday 8:00 a.m. – 5:00p.m.

Central Georgia Diagnostics Lab Services Telephone Numbers

Director Outpatient Laboratory	(478) 633-1072
Clinical Laboratory Supervisor	(478) 633-2092
Client Service Representative	(478) 633-1234
Laboratory Front Desk	(478) 633-1234
Toll Free	(888) LAB-XRAY

SUPPLIES

Biohazard transport bags, containers for urine and stool specimens, blood drawing supplies, and request forms are provided to outreach clients at no charge. Special collection containers are also provided. Please contact the CGD Client Services Representative 478-633-1234.

COURIER SERVICE

Scheduled and stat courier service is provided Monday- Sunday. For information on this service, please contact the CGD Client Service Representative 478-633-1234.

RESULTS REPORTING

Individual patient results include the patient's name, lab identification number, collection times, date, result, and normal values. All final results are faxed or transmitted electronically to the ordering physician. All critical values are called immediately to the provider. Other results are called upon request during normal office hours.

BILLING INFORMATION

Several billing options are available to Central Georgia Diagnostics clients. You may elect client billing, third party billing or patient direct billing.

Client: An itemized invoice will be sent monthly to the referring institution, health care provider, physician, group practice. This invoice will include a list of charges for tests performed on each patient. Payment is due within 30 days of receipt of the invoice.

Proper laboratory requisitions must be sent with patient or samples to ensure correct billing for client accounts. The requisition must be marked Bill to: Account. Client accounts will be registered in the MCGG business office and must be approved by the Director of Patient Business Services.

3rd Party/Medicare/Medicaid:

In order for us properly bill for lab services, we depend on you to provide us with your Patient's **complete** billing information, including all medically appropriate diagnosis ICD-9 codes. If this information is not included on your patient's original requisition for lab services, then we must contact your office to obtain this information. If all billing information is not received your patient may receive a bill.

The following is a list of what is considered **complete** billing information:

- | | |
|--|--|
| * Bill to: account, patient, other | * Medicare / Medicaid number |
| * Patient name (last, first, middle) | * Relationship to insured |
| * Date of birth | * Insurance company name |
| * Sex | * Member/insured ID# |
| * Patient Social Security # | * Group # |
| * Patient phone # | * Insurance address |
| * Print name of insured/resp. party
(last, first, middle) if other than pt. | * ICD9 diagnosis code(s) for tests ordered |
| * Street address of insured/resp. party | |

** A copy of the insurance card front and back may be attached to the lab requisition form.

Patient Billing- (Self Pay): Bill is sent directly to patient/guarantor at the home address. No insurance or third party is filed.

If you elect to have your patient billed by MCGG, the patient becomes responsible for the full payment of the bill. If the patient has insurance coverage, please refer to the section of this manual that describes Third Party Billing information requirements. When you select to bill the patient directly, the

- Patient's Name
- Current Address (Including Apt. #)
- Zip Code
- Patient Social Security Number
- Date of birth
- Patient Telephone Number (Including Area code)

must appear clearly on the test requisition, in the areas provided. Provide all requested information to avoid follow-up correspondence to you from the billing Department. Please be sure to inform your patient that they will be receiving a laboratory bill from MCGG. Patient payments are due by the date indicated in the billing information section, which is located in the upper right hand corner of the bill.

Payments

Payments may be made to the Medical Center Business office during business hours

Medical Center of Central Ga
2490 Riverside Dr
Macon Ga 31297-7399

or mailed to:

Medical Center of Central Ga.
P.O. Box 116417
Atlanta Ga 30368-6417

Billing Inquiries:

Billing Customer Service : 478-633-7326

Third Party Billing Information

CGD Laboratory services can and will accept payment from many agencies and insurance companies. To avoid follow-up correspondence from the Billing Department, provide all the billing information, including all medically appropriate current ICD9 diagnostic codes, on the requisition in the areas provided.

Review your patient's insurance identification cards to ensure accurate Identification Number, correct spelling of names as they appear clearly on the requisition. **Patients will be responsible for charges such as non-covered services, co-pay amounts, deductible amounts, etc. depending upon the type of coverage they have.**

Please communicate this information to your patient at the time of service.

Billing Guidelines

Payors (Including Medicare) are focusing more and more on medical necessity guidelines. Many payors require laboratories to include diagnoses (diagnosis, symptom, condition, complaint or problem) on every claim as documentation of medical necessity.

Diagnosis information must be furnished using the ICD-9-CM coding system. Health Care Financing Administration (HCFA) guidelines indicate that the ultimate responsibility for providing correct ICD-9 codes lies with the ordering physician. All Medicare carriers have implemented Local Medical Review Policies that restrict the medical conditions under which Medicare payment for certain tests will be made. These policies define the medical conditions (diagnosis, symptom, condition, complaint or problem) or ICD-9 codes that establish the medical necessity of certain tests under which payment will be made. If a limited coverage test is ordered in conjunction with a diagnosis code that is not included in the Medicare carrier's predetermined list of diagnoses, Medicare will not pay for the test.

Any diagnosis information submitted on Laboratory claims must be furnished by the ordering physician or his or her authorized staff, and must be consistent with the diagnosis information documented in the patient's medical records for that date of service.

Additionally, we need you to provide an **Advance Beneficiary Notice (ABN) (formerly known as Patient Acknowledgement of Non-Covered Services [PANS])** form when a limited coverage tests is ordered and the diagnosis provided does not support medical necessity (making the test likely to be denied by Medicare). The ABN form should be signed by the patient for each test requisition on which a limited coverage test is ordered, either individually or as part of a panel, when the diagnosis does not support medical necessity. This will allow MCCG to invoice the patient for the test if it is not covered

within the diagnosis restrictions in the Local Medical Review Policies. The laboratory has modified its test requisition to include test CPT codes and to provide room for more diagnosis codes. The ABN form should be completed by you and the patient and submitted along with the test requisition, that includes an order for any non-covered tests, as well as tests not covered by Medicare because they are considered to be experimental or used primarily for screening purposes, (for example, tests that have not yet been approved by the FDA are excluded from Medicare coverage).

The laboratory has a booklet available for you to use as a quick reference tool in determining whether a particular limited coverage test is covered for your Medicare patient's diagnosis; this booklet can be obtained by calling Laboratory Client Services. However, this booklet is NOT to be used as a coding guideline for providing "reimbursable" diagnosis codes. The ICD-9 codes provided on the test requisition (which will in turn be submitted to Medicare and other payors) **MUST** be consistent with the information contained in the patient's medical records for that date of service. The ICD-9 manual is the definitive resource for a complete listing of all ICD-9 codes.

Payors' recent medical necessity guidelines and Local Medical Review Policies represent a fundamental shift in the way in which physicians must document orders for clinical laboratory tests for Medicare patients, in summary:

1. If a limited coverage test is ordered for a patient under a medical condition (ICD-9 code) that the Medicare carrier deems as medically necessary, the laboratory must receive the ICD-9 code on the test requisition from the physician so that we may submit the ICD-9 code on the Medicare claim.
2. If a limited coverage test is ordered for a patient under a medical condition (ICD-9) that the Medical carrier deems as medically unnecessary and is likely to deny, the laboratory must receive the appropriate ICD-9 code that justifies the service, in the physician's judgement, **AND** an ABN form signed by the Medicare patient. (A properly executed ABN form is required to seek reimbursement directly from the Medicare patient if Medicare denies the claim.)

CPT Codes (Current Procedure Terminology Codes)

The indicated CPT Codes are provided for informational purposes only. This coding is based on our current test methodology. We cannot accept responsibility for reimbursement you may or may not receive based on the procedure coding we have provided. Any questions regarding program coding should be confirmed with the payor being billed.

CPT codes are provided with each test for reference, in an effort to improve understanding of the diagnostic procedures performed. The application of a specific code to a given procedure is a matter of individual interpretation.

It is the client's responsibility to determine the appropriate coding when a client is billing a third party payor for laboratory services.

SPECIMEN COLLECTION

BLOOD COLLECTION TUBES

The following abbreviations for the appropriate Vacutainer blood collection tubes are located in the test information found under individual test listings.

Gold	- gold top, 6 ml clot activated, gel, serum tube
SR	- small red stopper, 7 mL capacity, no additive
Blue	- blue stopper, 5 mL capacity, Na citrate 3.2 % Buffered
Lav	- lavender stopper, 3 mL or 5 mL capacity EDTA
Pink	- pink stopper, 6 mL EDTA Blood Bank
GRN	- green stopper, 7 mL capacity, heparin
BCul	- blood culture bottle, collect sterile conditions
Gray	- gray stopper, 7mL capacity, Na fluoride

Microvolume Collections

- Serum capillary tube (red cap): 0.5 mL capacity typically yields 0.20 mL of serum
- Heparin, lithium capillary tube (green top): 0.5 mL capacity yield 0.2 mL plasma
- EDTA capillary tube (lavender top): 0.25 mL minimum volume
- Pediatric blue top: 1.8 mL minimum volume
- Pediatric gray top (no fluoride/K oxalate): 0.250 mL

SAMPLE IDENTIFICATION

Specimens must be clearly labeled with two unique identifiers, eg. Patient name (Last, First), and lab requisition number. Specimens for testing by Blood Bank Department require Date and time, patient social security or Medical Record number, and phlebotomist initials. The labeling must match accompanying requisition. Specimens with no identification or incorrect information will be rejected by the laboratory. The client will be notified during business hours, laboratory client services will request recollection of sample.

MINIMUM VOLUMES

When minimum volumes are listed, they represent the true minimums required to perform the test. These do not usually allow for repeat or confirmation testing. Collection of double the minimum is recommended whenever possible. **Please call the laboratory about specific test requirements for unlisted tests or any additional information you require.**

SPECIMEN STABILITY

Specimens collected in gel barrier tubes (gold) must be centrifuged prior to delivery to lab.

VENIPUNCTURE PROCEDURE

Prepared by	Date Adopted	Supersedes Procedure # / Dated
Christine Presley, MT (AMT)	03/07/11	PHL1-005 / 12/08/08

- I. **Principle:**
Phlebotomists perform venipunctures to obtain blood specimens for laboratory evaluations. Phlebotomists must use proper technique, as well as professional and courteous behavior to obtain the blood sample skillfully and tactfully.

II.

Procedure:

- A. Test requests are assigned an accession number to identify the sample to be collected. Collection lists are printed by the computer operator or phlebotomist. The barcoded collection labels are used to label the appropriate tube with the accession number.
- B. The phlebotomist must properly identify the patient to ensure the blood is being drawn on the individual designated on the label or requisition form. The patient should be asked his/her name and DOB. If the patient is unconscious, very young, or deaf, the nurse should be asked to identify the patient. The armband must be checked for the patient's name and hospital identification number. If the patient has no armband, the specimen will not be collected until the nurse places the armband on the patient.
- C. The phlebotomist should identify him/herself to the patient and explain that they are from the laboratory and will need to collect a blood specimen. The phlebotomist should reassure the patient and gain his confidence by briefly explaining the procedure. Patients should not be told "This won't hurt."
- D. The patient should be asked if he or she has followed any diet restrictions if the specimens are for tests which require the patient to fast or eliminate certain foods from the diet prior to the blood collection. Also ask if they have a latex allergy, have had problems with blood draws, or are taking any blood thinners. (note* Phlebotomy supplies at MCCG do not contain latex)

- E. The phlebotomist should wash his/her hands or use hand sanitizer.

**Script to use for B – E: "Hi, my name is _____, I'm from the lab and need to draw some blood from you. I'm going to need to turn your light on so I can see. Would you please tell me your name and date of birth? I need to look at your armband. When was the last time you had anything to eat or drink? Are you taking any blood thinners? Have you ever had a problem with getting your blood drawn? I'm washing my hands for your protection."*

- F. The patient in bed should be on his/her back with their arm extended to form a straight line from the shoulder to the wrist. The patient in a chair should extend his/her arm on the armrest to form a straight line from the shoulder to the wrist. In either case, the arm should not be bent at the elbow. A pillow may be placed under the patient's arm if additional support is needed. Do not draw blood from a patient seated in a chair without arms or a locking device to prevent the patient from falling.
- G. Supplies should be assembled according to the patient's physical characteristics and the amount and type of specimens needed. A syringe or butterfly is needed when drawing a specimen from fragile, small veins or when drawing from veins located in the back of the hand or wrist. Otherwise, a Vacutainer system is used which consists of a sterile blood collection needle and a holder that is used to secure both the needle and evacuated tubes. Other supplies needed are the tourniquet, alcohol swab, evacuated tubes containing premeasured vacuum (and in some cases, a premeasured additive), gauze and tape, or a bandaid. The evacuated tubes are color-coded to facilitate recognition of the tube additive and to know which tubes to use for the requested test.
- H. Put on gloves
- I. The tourniquet should be tied on the arm approximately 4 inches above the intended puncture site and the patient should be asked to make a fist.
- J. The phlebotomist palpates the veins to determine the best puncture site. The veins of choice are the median cubital, cephalic cubital, and basilic cubital veins in the antecubital area of the arm. However, the wrist and hand veins are also acceptable for venipuncture. The following sites are NOT appropriate for venipuncture:
 - 1. scarred areas
 - 2. the arm on the same side as a mastectomy
 - 3. a vein above the IV (the tourniquet must be able to be tied BELOW the IV and the draw site must be approximately 5-6 inches below the IV site to avoid possible fluid contamination).
 - 4. an arm with grafts, fistulas, or cannulas
 - 5. the arm in which blood is infusing

- 6. areas where there is a hematoma
- 7. edematous areas

If a site above an IV must be used, the IV should be turned off for at least two (2) minutes before the venipuncture is performed and a waste tube should be collected and discarded. The infusing fluid should not contain any of the analytes being tested.

- K. If superficial veins are not apparent, blood can be forced into the veins by lowering the arm or applying heat to the area.
- L. The tourniquet is not left on the arm for more than one minute to prevent hemoconcentration. It should be removed while the phlebotomist prepares the puncture site.
- M. The puncture site is cleansed with 70% alcohol, beginning at the puncture site and moving the alcohol pad outward in concentric circles. The area should be allowed to air dry for 30 seconds.
- N. The tourniquet should be reapplied, taking care not to let the ends of the tourniquet touch the cleansed venipuncture site.
- O. The puncture site should not be repalpated before venipuncture.
- P. The vein should be anchored using placing the thumb on the vein below the intended puncture site and applying downward pressure to stretch the skin. DO NOT place a finger ABOVE the site as this places your finger in harm's way for a needlestick.
- Q. Venipuncture techniques for syringe:
 - 1. To prepare the syringe, remove it from the manufacturer's packaging and move the plunger up and down in the barrel of the syringe several times to facilitate movement of the plunger. Be sure the plunger is completely depressed into the syringe barrel before proceeding to the next step.
 - 2. Select an appropriate needle and put it on the syringe.
 - 3. Uncap the needle and inspect it for manufacturing defects.
 - 4. Insert the needle into the patient's arm, bevel up. Often, when the needle is in the vein, a small amount of blood will appear in the hub of the needle. This is what is referred to as the "flash back."
 - i. withdraw the desired amount of blood by pulling back slowly on the plunger of the syringe. Pulling back too hard on the plunger can cause the blood to hemolyze.
 - ii. Release the tourniquet and ask the patient to open their hand.
 - iii. Gauze should be placed over the venipuncture site and remove the needle slowly keeping the bevel up. Do not apply pressure until the needle has been completely withdrawn from the skin.
 - iv. Pressure should be applied to the venipuncture site until bleeding stops. Tape can then be placed over the gauze
 - v. to form a pressure bandage, or a bandaid can be applied if appropriate.
 - vi. Activate the safety device by snapping the cover over the needle. Remove the needle and dispose of it in an appropriate sharps container.
 - vii. Place a blood transfer device on the syringe, then insert the tubes into the device to puncture through the stopper of each collection tube needed, and allow the correct amount of blood to fill each tube. Mix all tubes 5 – 10 times.
 - viii. Dispose of the blood transfer device and syringe in an appropriate sharps container.
- b. Venipuncture techniques for Vacutainer:
 - i. Thread the Vacutainer needle into the holder until secure.
 - ii. Position the holder between your thumb and index finger.
 - iii. Uncap the needle and inspect the needle for manufacturing defects.

- iv. Push the stopper of the blood collection tube into the holder up to the recessed guideline on the needle holder. Do not push the tube beyond this line, or loss of vacuum may occur.
- v. Insert the needle into the patient's arm, bevel up.
- vi. Push the evacuated tube onto the back of the needle, and allow the tube to fill.
- vii. Keeping the holder still, pull the evacuated tube off the back of the needle. If more tubes are needed, they may be pushed onto the back of the needle and allowed to fill by following the same procedure.
- viii. Mix all tubes 5-10 times.
- ix. Release the tourniquet and ask the patient to open their hand.
- x. Gauze should be placed over the venipuncture site and remove the needle slowly, keeping the bevel up. Do not apply pressure until the needle has been completely withdrawn from the skin.
- xi. Activate the safety device by snapping the plastic cover over the needle and dispose the entire device in a sharps container.
- xii. Pressure should be applied to the venipuncture site until bleeding stops. Tape can then be placed over the gauze to form a pressure bandage, or a bandaid can be applied if appropriate.
- c. Winged collection sets can be used by attaching either a syringe or Vacutainer holder to the tubing. When using a Vacutainer holder to collect the specimen directly into the tubes, remember to collect a small amount of blood into a waste tube before collecting tests in the blue top tube used for coagulation. This is necessary to be able to draw out the air that is in the tubing. If this step is not taken, air will enter the blue top tube and the sample will not have the correct blood to anticoagulant ratio. The discard tube should be a non additive or a coagulation tube.
- d. Only the required tubes are to be collected from the patient. The specimen requirements are included on the collection label.

Example: 1 red & 1 lav will be on the label for a RBC folate

To minimize adverse complications, excessive amounts of blood are not to be taken from patients. *Iatrogenic Anemia* is an acquired anemia due to excessive blood collections.

- e. Tubes are to be collected following the CLSI (NCCLS) recommendations for the correct order of draw.

Use the same order of draw for Vacutainer and syringe collections:

- i. Blood culture tubes (yellow stopper), or culture bottles
- ii. Citrate (light blue stopper), or coagulation tubes
- iii. Non additive, serum tubes (red stopper)
- iv. Gel separator tube (gold top), or SST
- v. Heparin (green top)
- vi. Ethylene diamine tetraacetic acid (EDTA) (lavender top)
- vii. Oxalate / fluoride (gray stopper)
- viii. Other additive tube

NOTE: Per CLSI (NCCLS), the order of draw has been revised reflect the increased use of plastic blood collection tubes. Plastic serum tubes containing a clot activator may cause interference in coagulation testing. Studies have shown that the PT and APTT results are not affected if tested on the first tube drawn. Since it is not know whether other coagulation testing is affected, it may be advisable to draw a second tube for other coagulation testing. (effective 1/1/2004)

- f. Make sure all sharps are disposed of in an appropriate sharps container.

- g. The patient's name must be copied onto the blood collection tube from the patient's armband before placing the appropriate bar code label on the tube. Remember to compare the information on the label with the armband again before placing the label on the tube. The phlebotomist must also document the time of collection and their phlebotomy tech code.

NOTE: Per CLSI (NCCLS): The completed label MUST be attached to the tube BEFORE leaving the side of the patient after the specimen is collected. The completed label should include:

- i. Pt's first and last name
- ii. ID# (MR#)
- iii. Date
- iv. Time of collection
- v. Initials

Tubes are not to be labeled before drawing the specimen.

- h. Blood Bank tubes must have the following on the tube:
 - i. patient's first and last name copied from the armband
 - ii. Medical record number copied from the armband
 - iii. Date of collection
 - iv. Time of collection
 - v. Initials of the phlebotomist

This standard of labeling is required for compliance with AABB (American Association of Blood Banks) regulations.

- i. Any samples not labeled properly will be refused. The re-labeling of blood samples that are not properly labeled will not be allowed.
- j. The specimen should be chilled in ice if required.
- k. Remove gloves.
- l. Wash hands.
- m. The blood specimens should be taken to the laboratory and further processed. An impervious bag is recommended for specimen transport.

III. **References:**

- The Clinical Laboratory Standards Institute (formerly NCCLS) Document H3-A6, 2007.
- Phlebotomy Handbook, 8th Edition, Diana Garza and Kathleen Becan-McBride, Appleton and Lange, Stanford Connecticut, 2010.
- The Health Care Professional's guide to quality patient care, Helen Maxwell and Virginia Faber, Copyright Pending Aug. 2001.

URINE COLLECTION CONTAINERS

Routine and 24-hour urine containers (with appropriate preservative) are available from the laboratory for Central GA Diagnostics clients.

COLLECTION OF 24-HOUR URINE SPECIMENS

Unless the physician specifies otherwise:

- At specified time the patient empties bladder and specimen is discarded.
- All urine produced during the next 24 hours is saved and combined in the large plastic container.
- At the same time of the following day, the patient empties bladder and this urine is included in the pooled specimen.
- Specimen should be kept refrigerated or on ice during collection period and sent promptly to the laboratory.

- Some tests require preservatives, information regarding special handling and storage is provided to patient upon receipt of the container.

COLLECTION OF BODY FLUIDS

Body fluids (ascitic, pleural, pericardial, etc) should be collected in a sterile container of appropriate size and sent promptly to the laboratory. Specimen collected in syringe must have needle removed prior to transport to lab.

CRITERIA FOR SPECIMEN REJECTION

Below are general criteria which apply to all specimens. Other specific criteria which may apply to individual procedures are detailed in the causes for rejection section under the individual test listings.

- specimen improperly labeled
- specimen improperly collected and/or preserved
- hemolyzed specimens
- specimen sample volume insufficient for test(s) ordered (physician will be contacted to determine what tests he/she would like deleted because of short sample, except for coagulation tests which require the correct volume for any testing.)
- outside of container contaminated with specimen
- patient not properly prepared
- Blood Bank samples that are not labeled with name, SSN, date of collection, time of collection, and collector's initials

BACTERIOLOGICAL SPECIMEN COLLECTION---CULTURES

Cultures

I. Anaerobic Cultures

- A. Anaerobic transport containers are available for CGD clients from the laboratory.
 1. Swab specimens --- Anaerobic Transport swab
 2. Fluids or aspirates --- sterile container
- B. Unacceptable specimens for anaerobic culture include throat or n/p swabs, sputum, feces, urine (except for suprapubic aspirates), eye or ear specimens, and vaginal or cervical swabs not collected by visualization via speculum.

II. Blood Cultures

Clean the venipuncture site using the blood culture prep kit available from the laboratory. Instructions are included with the kit.

- A. If multiple tests are ordered, the blood culture sample is collected first.
- B. The rubber diaphragm tops of the blood culture bottle must be cleaned with alcohol before injecting blood.
- C. Routine blood cultures (available from lab): The type and number of blood culture bottles to use per venipuncture depends on the amount of blood collected. The optimum volume of blood is 20 mL. Use the chart below for determining what bottles should be used.

Blood Volume	Purple Top Aerobic (80A)	Red Top Anaerobic (80N)
10-20mL	½ collected	½ collected
< 10 mL	All	None

- D. AFB(TB) blood cultures (available from lab, SPS vacutainer tube, yellow top) --- using blood culture prep kit, collect 3-5 mL of blood.
- E. Fungal blood cultures (available from lab, Purple Top bottle) --- using blood culture prep kit, collect 5-10mL of blood.

III. Endocervical Cultures

- A. Obtain under direct vision with a speculum.
- B. Gonorrhea culture or DNA probe
 - Culture – Cervix is wiped clean and fresh exudate is collected with a swab. Swab is placed in a Culturette type container.
 - DNA probe ---Cervical swab-1. Special collection kits available from lab
 - 2. The cervix is wiped clean and a swab rolled firmly against the cervical wall in order to collect the epithelial cells.
 - Urine- Collect in sterile urine container, first 15-20 ml of urine obtained after waiting at least 1 hour from prior urination. Refrigerate sample immediately and transport to lab on ice. (Ice packs available from lab on request.)

- C. Herpes simplex culture
 - 1. Special collection kits are required and are available from the laboratory.
 - 2. Fluid from lesions is collected on a swab and the swab is placed in a special tube of transport broth.
 - 3. The specimen is sent promptly to the lab or refrigerated for no longer than overnight.

- D. *Chlamydia* culture ---Cervical swab
 - 1. Special collection kits are available from the lab. (Viral/Chlamydia Media)
 - 2. The cervix is wiped clean and a swab rolled firmly against the cervical wall in order to collect the epithelial cells.

- E. *Chlamydia* DNA probe ---Cervical swab
 - 1. Special collection kits are available from the lab.
 - 2. The cervix is wiped clean and a swab rolled firmly against the cervical wall in order to collect the epithelial cells.
 - Urine- Collect in sterile urine container, first 15-20 ml of urine obtained after waiting at least 1 hour from prior urination. Refrigerate sample immediately and transport to lab on ice. (Ice packs available from lab on request.)

IV. Bacterial Culture

- Specimens are collected using a Culturette type collection kit
- A. If smears are ordered, a separate Culturette is required.

V. RSV Direct Test (antigen detection)

- A. Nasal aspirates
 - 1. Attach a No. 8 French soft plastic feeding tube through a valve-containing trap to an electric

- suction apparatus.
 - 2. Attach a sterile catheter tip to the tube and introduce the tip through the nares to the back of the nose.
 - 3. Apply suction intermittently while catheter is slowly withdrawn. Collect in a sterile container.
 - 4. Optimum specimen is 0.3 mL and deliver specimen to lab promptly.
- F. Nasal washings
- 1. The point of a suction bulb containing 3-7 mL of saline is placed in the nose so as to completely occlude one side.
 - 2. The saline is then squeezed into the nose and rapidly aspirated.
 - 3. The secretions are expelled into a sterile container and promptly delivered to the lab.

VI. Fecal (stool) Cultures and Parasitology Tests

- A. Specimens are to be collected in a clean, dry container free of urine and toilet bowl water.
- B. For culture, place a tablespoon amount of formed stool or approximately 5 mL of liquid stool into a feces collection vial containing Carey-Blair medium (red colored). Shake to homogenize specimen.
- C. For comprehensive ova and parasite microscopic examination, place a tablespoon amount of formed stool or approximately 5 mL of liquid stool into a vial containing SAF fixative (clear colored). Shake fixative vial to homogenize specimen.
- D. For Giardia and/or Cryptosporidium antigen, a tablespoon portion or a few milliliters (if liquid) of feces is placed in an empty fecal transport container and/or a vial containing SAF fixative (clear colored).
- E. Liquid stools for the examination of amebic trophozoites should be sent promptly to lab.
- F. Specimens containing oils, bismuth, and barium are generally unsuitable for examination.

VII. Fungus Cultures (All specimens placed in sterile container)

- A. Skin scrapings --- the infected area should be washed with 70% alcohol and scrapings should be taken from active border areas of lesion.
- B. Nail scrapings --- the area of infection should be washed with 70% alcohol. The scrapings or clipping of the nail should be selected from areas of active infection.
- C. Hair --- the basal portion of the hair or hair stubs may be submitted. Select hairs from the edges of infected areas.
- D. Subcutaneous mycoses --- specimens include crusts, pus, exudates, aspirated fluid and tissue.
- E. Systemic mycosis --- specimens include CSF, sputum, bone marrow, and tissue.

VIII. Nasopharyngeal Cultures

- A. A nasopharyngeal swab is used to collect the specimen. The swab is inserted through the nose to the posterior nasopharynx, allowed to remain a few seconds then removed.
- B. An alternative method is to bend the swab near the tip and insert it through the mouth and behind the uvula and soft palate into the nasopharynx. Care should be taken to avoid oral cavity contamination.

IX. Sputum Cultures

- A. A sputum collection container is used provided to CGD clients.
- B. The mouth should be rinsed and if dentures are present, they should be removed.
- C. The specimen should represent a true pulmonary secretion after deep coughing. The first early AM specimen is preferable.

X. Throat Cultures

- A. With the patient's tongue depressed and the throat well exposed, rub the swab over the back of the throat. Rub over areas of inflammation, exudation, or ulceration.
- B. Follow directions on Culturette package --- provided to CGD clients.

XI. Urethral Cultures

Specimens should not be collected until 1 hour after urinating. Culturette provided to CGD clients.

- A. See Endocervical cultures for collection kits for gonorrhea, herpes, and *Chlamydia* testing.

XII. Urine Cultures

- A. A catheterized, clean-catch, midstream, suprapubic aspiration or urine from an indwelling catheter may be submitted with the method of collection stated on the requisition.
- B. When an indwelling catheter is in place, urine should not be collected from the drainage bag.
- C. In the clean-catch midstream technique, the periurethral area is carefully cleansed with towelettes or Soap-soaked sponges and well rinsed with warm water to remove the detergent. The first portion of the urine is discarded and the subsequent portion is passed into an acceptable container.
 - 1. If the urine is sent to the laboratory, the specimen container should be sterile. If it is not sent promptly, the specimen should be refrigerated.
 - 2. If the specimen is inoculated on a dip slide, the specimen container need not be sterile, but should be clean. The dip side is either dipped into the freshly collected urine or urine is poured over both sides of the agar surfaces. Dip sides are available from the lab.
- D. A 24-hour collection for AFB culture is not acceptable because of urethral contamination and the dilution of the acid fast organism. The first morning specimen is preferable.

XIII. Viral Cultures

- A. Special collection kits are required and available from the laboratory.

- B. Specimens are collected as required for bacterial (routine) cultures and sent promptly to the lab.

XIV. **Wound Cultures, Routine Aerobic**

- A. Clean all drainage from wound using gloves and sterile gauze. If the wound is healed over with a scab, this should be removed before collecting the specimen.
- B. The specimen should be collected using a Culturette --- (provided to CGD Clients) taking care not to contaminate the swab with surface organisms around the wound. It may be necessary to use pressure on the wound to cause drainage.
- C. The preferred method of collection is by needle aspiration. Insert a needle attached to a syringe through properly prepped adjacent intact skin to the depth of the wound and aspirate infected material. Transfer material to a red top Vacutainer tube.

XIV. **Microbial Stains and Smears**

- A. General --- for specimens submitted on swabs, a separate swab is required for each test requested.
- B. Gram stain
 - 1. Not recommended for throat, fecal, or blood specimens.
 - 2. Performed routinely on CSF and other body fluids (excluding urine) and expectorated sputum when a routine (bacterial) culture is requested.
 - 3. Performed routinely on wound and surgical specimens when a routine (bacterial) culture is requested and enough material is submitted.
 - 4. Must be requested on other specimens (eg urine, cervical specimens).
 - 5. May be requested separately without a culture.
- C. AFB smear
 - 1. Not performed routinely on fecal, gastric, blood, and non catheterized urine specimens.
 - 2. Performed routinely on other specimens whenever an AFB culture is requested.
 - 3. May be requested separately without a culture.
- D. KOH prep
 - 1. See fungus cultures for proper specimen collection.
 - 2. Not performed on CSF. If requested, an India Ink prep will be substituted.
 - 3. Not performed on vaginal specimens. If requested a wet prep will be substituted.
- E. India Ink prep -- Performed on CSF when requested.
- F. Wet prep-Collect specimen on a swab and immerse in a small amount of saline. Send to laboratory promptly.
- G. Fecal smear for WBCs -- A pea-sized portion or a few milliliters (if liquid) of feces is placed in an empty fecal transport container).
- H. Trichrome stain -- Performed routinely on all liquid or soft fecal specimens when a comprehensive ova and parasite determination has been requested.

Anatomic Pathology and Cytology Specimens

Surgical Pathology Specimens

Routine specimens are submitted in 10% neutral buffered formalin. Ideally, the formalin to tissue ratio should be 10:1. Large specimens may be submitted fresh. Tissue may be submitted fresh for special studies in an appropriate container.

Some biopsies require special consideration with prior arrangements with Histology. These include:

- Skin biopsies for immunofluorescence: to be submitted in Michelle's solution
- Renal biopsies: to be picked up by Histology personnel at the time of biopsy
- Skeletal muscle biopsies: to be delivered stat in a muscle clamp in a fresh state to Histology
- Breast biopsies when carcinoma may be present: to be placed in formalin and delivered to histology as soon as possible.
- Lymph nodes when there is a suspicion of malignant lymphoma: to be delivered as quickly as possible in a fresh state for possible flow cytometric studies, etc.

All the special handling procedures should be indicated on the requisition.

Conventional Pap Smear

- Scrape: With spatula, thoroughly and gently scrape the entire ectocervix with emphasis on the squamocolumnar junction. Spread material evenly onto glass slide and fix immediately.
- Brush: Use tapered synthetic fiber brush to sample endocervical cells and mucus. Gently smear the brush onto the slide while rotating. Do not scrub brush onto slide. Fix immediately.

Both endocervical brush and cervical scraping can be applied to a single slide by first performing the extocervical scraping, immediately smearing the material on half the slide, and immediately spray fixing that half of the slide while shielding the other half with the gloved finger. The endocervical brush is then obtained, smeared on the remainder of the slide, and immediately spray fixed.

Thinprep Pap Smear

- Endocervical Brush/Spatula protocol- Obtain an adequate sampling from the ectocervix using the plastic spatula. Rinse the spatula as quickly as possible into the PreservCyt Solution vial by swirling vigorously in the vial 10 times. Discard the spatula.
Obtain an adequate sampling from the endocervix using the endocervix brush device. Insert the brush into the cervix until only the bottom most fibers are exposed. Slowly rotate brush $\frac{1}{4}$ to $\frac{1}{2}$ turn in one direction. Do not over rotate. Rinse the brush as quickly as possible in the PreservCyt solution by rotating the device in the solution 10 times while pushing against the PreservCyt 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.
Record the patient name and ID number on the vial.
- Broom like device protocol- Obtain an adequate sampling from the cervix using the 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 counter clockwise direction five times.
Rinse the broom as quickly as possible into the preserve cyt solution vial by pushing the broom in to 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.
Record the patient name and ID number on the vial.

Vaginal smear for hormone evaluation: Lightly scrape the lateral walls with spatula. Spread material evenly onto slide and fix immediately.

Medical Cytology

This section refers to all non-Gyn specimens with the exception of fine needle aspirates, sputums, and urines, which are more specifically addressed under other headings. These specimens are of two types: examination of premade smears (brushes from GI tract, ureter, bronchus, touch preps) and preparation of slides from fluids (pleural, peritoneal, cyst fluid, etc).

Glass slides and fixative may be obtained from Cytology. Fluids can be delivered in any appropriate container.

Collection

- **Fluids:** Fluids may be refrigerated and delivered to the laboratory as quickly as possible. If a prolonged interval between obtaining the specimen and delivering it to the laboratory is anticipated, cellular detail may be better preserved by adding an equal volume of 50% alcohol. On occasion, special studies such as flow cytometry or electromicroscopy may be indicated on fluids. Arrangements should be made with the pathologist for these specialized studies prior to obtaining the fluid for cytologic examination.
- **Premade smears:** Slides may be prepared from bronchial or gastrointestinal brushed by rolling the brush on the slide. It is important not to use excessive pressure, and it is critical that the slide be immediately fixed by immersion in 95% alcohol in order to prevent air drying.

Fine Needle Aspirate Cytology

The use of a thin needle to aspirate cells means that cells can be aspirated from almost any site in the body. This procedure is less traumatic to the patient while producing samples that may be diagnosed cytologically.

II. Specimen and Storage:

Any cell sample may be aspirated with a small gauge needle.

III. Reagents, Materials, and Equipment:

95% ethanol	Syringes
CytoLyt solution	Needles Syringe holder (gun)
Flow media	Disposable alcohol swabs
Betadine swabs	Microscope slides
3 step stain	Microscope
Sterile container	Gauze pads
Pencil	Requisition
Immediate evaluation worksheet	

IV. Procedure:

- A. Fine needle aspirations of deep sites are performed by clinician under radiographic guidance. Fine needle aspiration of superficial "lumps and bumps" may be performed by properly trained physicians. Pathologists will perform the procedure upon request of the referring physician. At the request of the Clinician, a Pathologist or Cytotechnologist will provide on-site immediate adequacy evaluation for CT or Ultrasound guided FNA's, brushings, and core biopsies.
- B. Each microscope slide must be labeled with the patient's name, and must be accompanied by the appropriate requisition.

- C. The specimen is obtained by aspiration with 23 or 25-gauge needles in accordance with previous training with special attention given to anatomic considerations and sterile technique. Ideally, 2-3 passes should be performed.
- D. The specimen is expelled in a small drop on a glass slide. Another glass slide is placed on top and the two are gently pressed together and pulled apart, smearing the specimen across the two slides.
- E. Fix one slide by immediately submerging in 95% alcohol. Allow other smear to air dry. Stain with 3 step stain (Diff Quik) if immediate evaluation is requested.
- F. Repeat this procedure if additional smears are desired or if additional passes are made.
- G. If flow cytometry is desired, one pass should be deposited in flow media (RPMI), which is labeled with the patient's name and other unique identifier.
- H. Additional specimen may be deposited in CytoLyt Solution and / or needles should be rinsed into CytoLyt for additional processing. CytoLyt tube must be appropriately labeled with two patient identifiers and the time of collection.

Sputum Cytology

Sputum cytology is a very useful method of cytologic investigation of the respiratory tract. Multiple samples can be obtained without causing any harm or discomfort to the patient, and the diagnostic yield of the cells is excellent.

II. Specimen and Storage:

Sputum collected in the manner described below.

III. Reagents, Materials, and Equipment:

70% ETOH	Identification Label
Collection jar	Cytology requisition form
Safety label	

IV. Quality Control:

- A. If too many inflammatory cells are found, the patient should received antibiotic and expectorant therapy 3 to 5 days, then the sputum should be repeated.
- B. The absence of pulmonary alveolar macrophages containing carbon particles shows the sample to be unsatisfactory, containing only saliva.

V. Procedure:

- A. A cytology requisition, collection jar containing 70% ETOH with an alcohol warning label, should be obtained from cytology.
- B. The requisition should be completed in full, the patient's name written on the collection jar (NOT the lid alone), and the safety label affixed to the jar.
- C. It is recommended that a minimum of three different samples be obtained. This is ideally done immediately after the patient awakens early in the morning for three consecutive days. The samples should NOT be collected during the same day.

- D. The patient should be instructed to rinse his mouth with water only prior to the procedure.
- E. The patient should be instructed to inhale repeatedly to full capacity of his lungs and exhale the air with an explosive cough. The resulting expectorant should be caught in the collection jar. This step should be repeated two or three times.
- F. The collection jar should be capped tightly and then shaken briskly to dispense the mucus threads and cells and allow for adequate fixation.
- G. It is a good idea to disinfect the outside of the container after each specimen is collected to guard against contamination by pathogens, like tuberculosis.
- H. After the sputum series has been collected, the completed requisition and the specimen should be delivered to cytology.
- I. Process specimen as outlined elsewhere in this manual. For specimens on inpatients, fresh samples with no fixative are acceptable.

VII. **Limitations:**

- A. Due to the usual high cellularity of sputum samples, careful screening of the smear is required.
- B. The specimen is NOT limited by degeneration or breakdown if properly fixed and may remain un-refrigerated during the specimen collection period.
- C. Specimens MUST be clearly marked with the warning label and patients warned NOT to drink the fixative.

Urine Cytology

Freshly voided or catheterized urine should be refrigerated and promptly forwarded to the Cytology Laboratory. If a delay of more than half a day is anticipated in transport to Cytology, an equal volume of 50% alcohol should be added to the specimen to preserve cellular detail. The specimen should be forwarded in an appropriate container labeled with the patient's name and accompanied by a completed requisition.

PRE-EMPLOYMENT AND FOR CAUSE DRUG TESTING

All samples submitted for pre-employment, employment or for cause testing should be submitted with a Medical Center Chain-of-Custody Requisition/Form. Complete drug screen kits are available from the laboratory. Instructions for collection are on the Chain-of-Custody Requisition/Form. Please follow instructions explicitly and submit to laboratory immediately. Positive results are validated by repeat testing and then confirmed by GC/mass spectrometry analysis.

PROFILES AND SURVEYS

(For methodologies, test performance schedules and normal values refer to alphabetical listings of individual tests)

BASIC METABOLIC PROFILE/ CHEM 8

Specimen Requirements: 2 mL serum (Gold)

Profile Includes:

BUN	Glucose
Chloride	Potassium
CO2	Sodium
Creatinine	Calcium

COMPREHENSIVE METABOLIC PROFILE /CHEM 14

Specimen Requirements: 2 mL serum (Gold)

Profile Includes:

Albumin	Calcium	CO2
Alkaline Phosphatase	Cholesterol	Uric Acid
AST (SGOT)	Glucose	
ALT (SGPT)	LDH	
Bilirubin, Total	Phosphorous	
BUN	Protein, Total	

HEPATITIS PROFILE, VIRAL - COMPREHENSIVE

Specimen Requirements: 2 mL serum (Gold)

Profile Includes:

HBS-AG	Hepatitis B Surface Antigen
HBS-AB	Hepatitis B Surface Antibody
HBS-Core	Hepatitis B Core Antibody
HAV-AB - Igm	Hepatitis A Igm Antibody
HCV-AB	Hepatitis C Antibody

HEPATITIS PROFILE, ACUTE (VIRAL)

Specimen Requirements: 2 mL serum (Gold)

Profile Includes:

HBS-AG	Hepatitis B Surface Antigen
Core- IgM	Hepatitis B Core IgM
HAVAB-IgM	Hepatitis A Igm Antibody
HCV-AB	Hepatitis C Antibody

HEPATITIS PROFILE, CHRONIC (VIRAL)

Specimen Requirements: 2 mL serum (Gold)

Profile Includes:

HBS-AG	Hepatitis B Surface Antigen
HBS-AB	Hepatitis B Surface Antibody
HBS-Core	Hepatitis B Core Antibody
HCV-AB	Hepatitis C Antibody

LIPID PROFILE

Specimen Requirements: 2 mL serum; 12-hour fast required (Gold)

Profile Includes:

Calculated LDL	HDL Cholesterol
CHD Risk	Triglycerides
Cholesterol, Total	

LIPID PROFILE CASCADE (REFLEX DIRECT LDL-C)

Specimen Requirements: 2ml serum ; 12 hour fast required (Gold)

Profile Includes:

Same as lipid profile above except that if Triglyceride exceeds 300 or the LDL can not be calculated, then a Direct LDL-Cholesterol is performed.

LIVER PROFILE

Specimen Requirements: 3 mL serum (Gold)

Profile Includes:

Albumin
Alkaline Phosphatase
ALT (SGPT)
AST (SGOT)
Bilirubin, Total and Direct
Total Protein

PRENATAL PROFILE I

Specimen Requirements: 6 mL clotted blood (Gold)*
7 mL EDTA Whole Blood (7 mL Pink top)*
5 mL EDTA whole blood (5 mL Lavender)*
PAP smear
* Tubes must be labeled with name, date, time, social security number,

and phlebotomist initials.

Profile Includes:

Antibody Screen	Pap Test
Anti-HBsAG	RPR
Blood Type and Rh	Rubella
CBC with Differential	

PRENATAL PROFILE II

Specimen Requirements: 6 mL clotted blood (Gold)*
7 mL EDTA Whole Blood (7 mL Pink top)*
5 mL EDTA whole blood (5 mL lavender)*
* Tubes must be labeled with name, date, time, social security number, and phlebotomist initials.

Profile Includes:

Antibody Screen	Pap Test
Anti-HbsAg	RPR
Blood Type and Rh	Rubella
CBC with Differential	Sickle Cell Test

RENAL FUNCTION PANEL

Specimen Requirements: 3 mL Serum (Gold)

Profile Includes:

Albumin	Glucose
Calcium	Phosphorus
Electrolytes	Bun
Creatinine	

THYROID FUNCTION CASCADE (THYROID REFLEX)

Specimen Requirements: 3 mL Serum (Gold)

Profile Includes:

- (1) TSH as screening test;
- (2) If TSH is > normal then perform T4 FTI
- (3) If TSH is < normal then perform T4 FTI; If FTI is not elevated, then perform True T-3 (Total T3).