



QA.SPEC.9.0 MID AMERICA CLINICAL LABORATORIES DIRECTORY OF SERVICES REFERENCE GUIDE

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About Mid America Clinical Laboratories, LLC

Mid America Clinical Laboratories (MACL) is an independent clinical laboratory jointly owned by the Community Hospital Network, St. Vincent Hospitals and Health Services, Quest Diagnostics, Inc., and CoLab, LLC. MACL embraces, from its founders, the concept of quality, service and excellence by working together.

MACL is customer-oriented, provides open and honest communication to engender trust and integrity with all of its customers and works with its associates as team members. In addition, MACL recognizes it is an extension of its founders and incorporates their missions' emphases on efficiency, respect for the individual, simplicity and quality improvement.

The primary objective of the partners in MACL is to provide Indiana-based laboratory services to physician practices throughout central and northern Indiana and to improve the efficiency of the individual hospital laboratories. The MACL mission drives us to provide a full range of clinical laboratory services to patients and other customers with an emphasis on high quality, efficiency and responsiveness.

MACL Laboratories

Our Hospital Based Laboratories (HBLs) provide transfusion services, chemistry, hematology, coagulation, urinalysis and rapid microbiological tests when results are needed for the immediate patient assessment and treatment.

The Regional Laboratory performs routine testing when results are not required immediately. Most microbiology and esoteric testing is performed in the Regional Laboratory because the technology precludes rapid turnaround (e.g. bacterial cultures).

Laboratory Service Centers provide a limited STAT testing menu as well as specimen collection services.

Quality Assurance and Laboratory Accreditation

Board-certified anatomic and clinical pathologists direct laboratory activities, providing supportive services in both the medical and technical areas. Well trained and competent certified medical technologists, cytotechnologists and technicians as well as a comprehensive and continuously monitored quality control program enable MACL to provide precision and accuracy in its test results. Day to day quality and accuracy are assured by internal and external proficiency testing programs.

Mid America Clinical Laboratories is accredited or approved to provide laboratory services by the following organizations:

- American Association of Blood Banks (AABB)
- Centers for Medicare and Medicaid Services
- Clinical Laboratory Improvement Amendments (CLIA)
- College of American Pathologists (CAP)
- Indiana State Department of Health



Mid America Clinical Laboratories' Services

Client Services

At MACL, we recognize that lab quality is defined by clinical quality and *service* quality. We continually strive to understand, respond to and meet the needs of our clients through functioning as a client advocate, recognizing and responding to service opportunities and facilitating resolution.

We maintain a call center staffed with courteous and knowledgeable associates, available to answer questions and offer assistance in obtaining laboratory testing services. MACL Client Services assists with questions about our test menu or test results. Client Services also helps with referrals to the appropriate MACL employee to assist with problem resolution and professional consultation.

Client Services is staffed seven days a week and calls are answered 24 hours each day.

All customer inquiries relative to specimen requirements, test results, test information, hard copy reports, etc., should be directed to Client Services at (317) 803-1010 or (877) 803-1010.

Courier Services/Specimen Pick-up

Courier service for specimen pick-up and supplies delivery at physician offices, clinics, hospitals and nursing homes is available daily throughout our service area. Our couriers work on a schedule designed to meet our customers' needs. Calls for pick-ups and ordering supplies should be directed to (317) 803-1020.

Patient Care Center Network

MACL has a comprehensive network of Patient Care Centers (PCCs). Our PCCs provide specimen collection services, including the following:

- Routine phlebotomy (venipuncture)
- Urine collections
- Capillary sticks
- Throat swabs

In addition to specimen collection, we have laboratory service centers and our hospital-affiliated labs that also provide a limited STAT test menu to support medically urgent situations.

Locations for PCCs are available by calling Client Services at 317-803-1010/877-803-1010 or online at www.maclonline.com.

Patients must bring a test requisition for service at our locations. The test requisition must be completed with specific test order codes, all medically appropriate diagnosis codes as provided by the physician, patient demographics and billing or insurance information.

Professional Consultations

Members of our staff are available for questions or medical and technical consultation. Our Client Services Representatives can provide assistance in contacting the appropriate MACL staff member for professional consultation.

Reference Ranges

Reference ranges (normal ranges) for interpretation of results are included on each patient test report. Because of continuing improvements in methodology and expanding knowledge in clinical interpretation, reference ranges do not remain static in a progressive laboratory. Each report includes current reference range information for the specific test.



Result Reporting

MACL releases test-related information only in accordance with regulations governing clinical laboratories and all health care providers and has measures in place to maintain the confidentiality of patients' protected health and personal information. Reports are delivered electronically or by mail. Alert (critical) results are flagged in the laboratory information system when results exceed the verification range. All alert and STAT values will be telephoned as soon as they are available, followed by the routine reporting method.

Turnaround times for STAT tests performed on site in the Hospital Based Labs will be one hour or less from time of receipt in the lab. Turnaround times for routine tests performed on site at the Regional Laboratory will usually be 12 hours. Most microbiology and esoteric test results are available within 48 to 72 hours of specimen receipt.

Test Additions – After Submission of Specimen

Client Services can arrange for additional testing if sufficient specimen type and volume remains after the initial tests have been completed. To request a test addition, contact a Client Services Representative at 317-803-1010/877-803-1010. We are required by federal regulations to obtain written authorization for every test we perform. A hard copy request for written confirmation will follow all verbal test requests. An employee authorized by the requesting client or physician must sign this written confirmation.

MACLOnline.com

Additional resources are available at www.maclonline.com. Information on lab test requirements, locations of our patient care centers, copies of our newsletters, and employment opportunities can be viewed.

MACL's Directory of Services (DOS)

Mid America Clinical Laboratories' Directory of Services (DOS) contains all the information needed to order and procure testing services. The DOS is made available to all customers and prospective customers via our web page and print format.

Unlisted Tests/Tests Not Found In This Directory of Services

We are continually developing new procedures. As a result, some tests may not be listed in this edition of the MACL DOS. Additionally, certain procedures are no longer offered because they have become obsolete. Contact Client Services for information on tests not found in this DOS.

Mid America Clinical Laboratories will accept testing that is referred to other facilities as a convenience to our clients if that laboratory is a testing partner of ours. A handling fee will be charged except as prohibited by law.



General Specimen Collection Information

Introduction

The quality of any laboratory test result is dependent on many variables. First, the patient must be properly prepared so that the best possible specimen can be collected. Next, the actual collection of the specimen must be completed. Then, the specimen should be properly processed, packaged and transported to the laboratory in a timely manner and under environmental conditions that will not compromise the integrity of the specimen. After all of these activities take place, a quality analysis can be performed. Specific specimen requirements for each test are listed in the General Test Listing section of this directory. Specimen requirements include information such as specimen volume, collection and transport containers as well as transport temperature. If additional information is needed for the interpretation of the test results or there are specific instructions for patient preparation, they are listed along with specimen requirements.

It is critical that an adequate specimen volume is submitted for analysis. The volume requested in this directory will be enough for initial analysis, as well as any confirmatory tests that must be performed. If an inadequate specimen is submitted, we may not be able to perform the initial test or required confirmatory procedures. If repeat or confirmatory tests cannot be performed, the report will indicate that specimen quantity submitted was "QNS" (Quantity Not Sufficient) for additional testing.

When serum or plasma is to be submitted for analysis, it is generally a good practice to collect a volume of blood that is 2 to 2.5 times the volume of serum or plasma needed for the test. As an example, if 4 mL of serum or plasma is needed for a test, collect 8 to 10 mL of blood.

When an inappropriate specimen or unclear test requisition has been submitted, the ordering physician will receive notification with instructions for resolving the problem. To prevent future delays, a report will be issued with information regarding proper specimen submission.

Proper Labeling

1. Test Orders

All laboratory specimens must be accompanied by a valid order. The order may be a manual or computer requisition and must indicate the patient first and last name. It is recommended that the patient's name on the primary container exactly match that on the requisition. In addition, test orders, date and time of collection, patient medical record number (for hospital registered patients), order number and ordering physician name must be included. MACL clients are assigned a unique customer number which is preprinted on the test requisitions.

In general, specimens will not be accepted in the laboratory without an order, an ordering physician, and without a patient name.

2. Hospital Patients

The identification label must be completed and affixed to the primary container after the specimen has been collected and before the specimen is taken from the patient's room. The following information must be included on the label:

- a. Patient's name (no nicknames)
- b. Hospital registration number
- c. Medical Record number



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- d. Date and time collected
- e. Patient's room number
- f. IS order number
- g. Source of specimen, (other than blood).
- h. Fi O₂ for blood gas specimens
- i. Initials of the person obtaining the specimen

3. Outside Facilities/Clients

The specimen is labeled by the individual obtaining the specimen. The following must be included on the label:

- a. Patient's name, written exactly as it appears on the test requisition
- b. Account number
- c. Date and time collected
- d. Source of specimen (other than blood). When submitting a specimen in a transfer tube, the specimen type must be indicated on the transfer tube label (e.g., serum, plasma, urine).

Note: When ordering tests in a series (e.g., growth-hormone stimulation, glucose tolerance, multiple-site renin specimens);

- a. Use one test requisition.
- b. Label each specimen with the patient's unique identifier, date and time of collection (if applicable), site (if applicable) or other pertinent condition under which each specimen was collected.
- c. Write the number of specimens on the test requisition.
- d. Submit all specimens within a series together in one specimen bag.

Health and Safety Precautions

All specimens should be handled as if they are infectious. The following safety guidelines must be followed when preparing specimens for transport to MACL.

1. Specimen container must be properly sealed. A leaking container not only compromises specimen integrity but poses a health hazard for those handling the specimen. A leaking specimen can also contaminate the requisition which is a safety hazard throughout the process.
2. Specimens collected in syringes will not be accepted with the needle attached. The needle must be removed and a syringe cap attached.
3. All specimens must be transported in a plastic ziplock bag as secondary containment. This protects anyone handling the specimen in case of leakage or breakage.
4. All specimens from outside facilities are transported in coolers with a fixed Biohazard label. This meets the requirements of CFR 1910.1030. (G), "Individual containers of blood or other potentially infectious materials that are placed in a labeled container during storage, transport, shipment, or disposal are exempted from the (individual specimen) labeling requirement."
5. Clients have the responsibility to secure the specimen for transportation in a locked box. It is the customer's responsibility to report to local authorities any loss of or tampering with specimens occurring before pickup by MACL.



Unacceptable Specimens

Specific instructions for storage and shipment of specimens for individual tests are listed under specimen requirements in the alphabetical listing of laboratory tests.

Occasionally, blood specimens are contaminated with substances that interfere with accurate sample analysis:

1. **Hemolysis**—Hemolysis occurs when the membrane surrounding red blood cells is disrupted and hemoglobin and other intracellular components escape into the serum or plasma. (This may occur with a difficult draw.) Hemolyzed serum or plasma varies in color from faint pink to bright red, rather than the normal straw color. Even slight hemolysis will alter certain test results. Grossly or moderately hemolyzed specimens may be rejected.
2. **Hyperbilirubinemia**—Icteric serum or plasma varies in color from dark to bright yellow, rather than the normal straw color. Icterus may affect certain test results. Upon receipt of such specimens, we may request a new sample to assure results of diagnostic value.
3. **Radioisotope interference**—Diagnostic procedures or therapy involving radioactive compounds may invalidate radioisotope assays. Obtain specimens for anticipated radioisotope assays before administering isotopes to the patient.
4. **Turbidity**—Turbid, cloudy or milky serum (lipemic serum) may be produced by the presence of fatty substances (lipids) in the blood. Bacterial contamination may also cause cloudy serum. Moderately or grossly lipemic specimens may alter certain test results. A recent meal can produce transient lipemia. For the majority of tests performed on serum, plasma or whole blood, a fasting specimen is preferred. Fasting is defined as no consumption of food or beverage, other than water, for at least 8-12 hours before testing. The fasting specimen provides information that reflects the physiological baseline of the patient. This information can easily be compared to information from tests obtained at other times and provides a means for reliably monitoring a patient's condition.



Blood Collection

1. **Blood, Plasma**
Plasma contains fibrinogen and other clotting factors when separated from the red cells. Evacuated tubes used to collect plasma specimens contain an anticoagulant and frequently a preservative. The additive in the tube is specified and correlates to the color of the tube stopper. Consult the individual test specimen requirement or MACL's tube collection chart to determine the correct additive/tube to use. Perform venipuncture. Invert tube gently at least 8 times, 4 times for light blue tubes. If the plasma is removed from the original Vacutainer vial, the transfer tube and requisition must be labeled to indicate that the specimen is plasma.

2. **Blood, Serum**
We recommend the use of serum separator collection tubes for most analyses. However, please check individual specimen requirements for restrictions. Perform venipuncture. Invert the tube gently at least five times.

Centrifugation Instructions:

- a. Do not remove the stopper at any time. Allow the blood to clot in an upright position at least 30 minutes (but not more than 60 minutes) before spinning. Do **not** centrifuge immediately after drawing blood.
 - b. Centrifuge at greater than 3000 RPM for 10 minutes.
 - c. Normally the specimen is transported to the laboratory in the original Vacutainer. Only transfer serum to a plastic vial when immediate freezing is necessary. Label the transferred specimen as serum. Do not freeze in glass tubes.
3. **Blood, Whole**
Collect whole blood according to the instructions provided for the individual test. Thoroughly mix the blood with the additives by gently inverting the tube at least ten times. Maintain the specimen at room temperature before transporting to our laboratory unless instructed otherwise by the specimen requirements. **Never** freeze whole blood unless specifically instructed by the specimen requirements.



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4. Common Blood Collection Tubes and Additives

Hemogard Closure	Rubber Stopper	Additive	Additive Function	Considerations	Laboratory Use
Plain Red	Plain Red	None	Contains no anticoagulants and no additives.	No additive. Clot formation takes 30 minutes.	Serum chemistries, serology, body fluids, therapeutic drug monitoring.
Light Blue	Light Blue	Sodium Citrate. 0.105 M, (3.2%)	Removes calcium to prevent clotting.	Tube should be full and mixed well. Blood to anticoagulant ratio very important (9:1).	Coagulation studies, PT, APTT, factor assay.
Green	Green	Sodium heparin, lithium heparin	Inhibits thrombin formation to prevent clotting.	Be careful of the type of heparin that is being used for what type of testing.	Plasma chemistries.
Lavender	Lavender	EDTA	Removes calcium to prevent clotting.	Should be well mixed; invert 6-8 times.	Whole blood hematology cell counting, CBC.
Pink	N/A	EDTA	Removes calcium to prevent clotting.	Should be well mixed; invert 6-8 times.	Blood Bank tests ONLY .
Gold	Black/Red	Gel separator/ clot activator	Clot activators shorten the time for clot formation. The gel forms a barrier between cells and serum.	Tubes should be inverted 5 times to expose the blood to the activator. Centrifuged after clot formation is complete.	Most chemistry testing and some drug levels. Not suitable for Blood Bank testing.
Gray	Gray	Sodium fluoride, Potassium oxalate	Inhibits glycolysis. Removes calcium to prevent clotting.	Should not be used for other chemistries.	Glucose testing, glucose tolerances, alcohol levels
Royal Blue	Royal Blue	None	Contains no anticoagulant.	Chemically cleaned and the rubber stoppers contain low levels of metals.	Toxicology, trace metals.
Royal Blue	Royal Blue	EDTA	Removes calcium to prevent clotting	Chemically cleaned and the rubber stoppers contain low levels of metals.	Toxicology, trace metals.
Tan	Tan	EDTA	Inhibits thrombin formation to prevent clotting.	Chemically cleaned and the rubber stoppers contain low levels of metals.	Lead
White	N/A	EDTA/Gel	Removes calcium to prevent clotting. The gel forms a barrier between the plasma and cells.	N/A	Some Hepatitis and HIV PCR tests.



Urine Collection

Urine, Chemistry

The normal composition of urine varies considerably during a 24 hour period. Most reference ranges are based on analysis of the first urine voided in the morning. This specimen is preferred because it has a more uniform volume and concentration, and its lower pH helps preserve the formed elements.

Urine for pregnancy testing should be a first morning voiding, or a random specimen with a specific gravity of at least 1.020. Note the time of collection of the specimen on the test requisition form and on the label of the container.

Urine, Hematology (Urinalysis)

To reduce contamination, the specimen submitted for urinalysis should be a clean catch "midstream" sample. Submit a first morning specimen whenever possible.

Patient Collection Guidelines: Clean Catch Midstream (CCMS)

Females:

1. Wash hands using soap and water.
2. Open the collection cup. Do not touch the inside of the cup or the lid.
3. Spread the outer portion of the urinary area and hold apart for collection.
4. Use three wipes to clean the area.
5. Wipe one side, front to back, with first wipe.
6. Wipe other side, front to back, with second wipe.
7. Wipe the center, with third wipe.
8. Urinate into the toilet for a few seconds and stop.
9. Continue to urinate into the cup.
10. Replace the lid on the container. Screw the lid on tightly to prevent leakage.
11. Wash hands.

Males:

1. Wash hands using soap and water.
2. Using one of the antiseptic wipes, clean the end of the penis. Retract the foreskin if needed.
3. Repeat using second wipe.
4. Open the collection cup. Do not touch the inside of the cup or the lid.
5. Urinate into the toilet for a few seconds and stop.
6. Continue to urinate into the cup.
7. Replace the lid on the container. Screw the lid on tightly to prevent leakage.
8. Wash hands.

Urine, Cultures

To reduce contamination, the specimen submitted for urinalysis should be a clean catch "midstream" sample.

Patient Collection Guidelines: Clean Catch Midstream (CCMS)

Females:

1. Wash hands using soap and water.



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2. Open the collection cup. Do not touch the inside of the cup or the lid.
3. Spread the outer portion of the urinary area and hold apart for collection.
4. Use three wipes to clean the area.
5. Wipe one side, front to back, with first wipe.
6. Wipe other side, front to back, with second wipe.
7. Wipe the center, with third wipe.
8. Urinate into the toilet for a few seconds and stop.
9. Continue to urinate into the cup.
10. Replace the lid on the container. Screw the lid on tightly to prevent leakage.
11. Wash hands.

Males:

1. Wash hands using soap and water.
2. Using one of the antiseptic wipes, clean the end of the penis. Retract the foreskin if needed.
3. Repeat using second wipe.
4. Open the collection cup. Do not touch the inside of the cup or the lid.
5. Urinate into the toilet for a few seconds and stop.
6. Continue to urinate into the cup.
7. Replace the lid on the container. Screw the lid on tightly to prevent leakage.
8. Wash hands.

Collection Guidelines: Indwelling Catheter.

Obtain the specimen with a needle and syringe. Select the puncture site 1-2 inches away from the catheter tube entry point. Cleanse the area to be punctured with 70% alcohol. Aspirate exactly 5 mL of urine with a sterile needle and syringe. Disinfect the rubber stopper and aseptically transfer the specimen to the urine transport tube provided. Specimens obtained from the collection bag are not suitable for analysis. Foley tips will not be accepted.

Urine, 24-Hour Collection

Because proper collection of 24 hour urine specimens is essential for accurate test results, patients should be carefully instructed in the correct procedure. Printed instructions for the patient are available from the laboratory.

1. Unless the physician indicates otherwise, instruct the patient to maintain the usual amount of liquid intake but to consume no alcoholic beverages.
2. During the collection period, keep the 24 hour urine container in a refrigerator or cool place to prevent growth of microorganisms and possible decomposition of urine constituents.
3. Have the patient empty his/her bladder in the morning into the toilet (not to be included in the 24 hour collection). Write the date and time of voiding on the container label.
4. Collect the patient's next voiding and add it as soon as possible to the 24 hour container.
5. Add all subsequent voidings to the container as in Step d. The last sample collected should be the first specimen voided the following morning at the same time as the previous morning's first voiding.
6. The start and stop times, along with the total volume, must be recorded on the specimen container.



Urine Drug Screens

Non-forensic screening for drugs of abuse occurs when a urine specimen is submitted without a forensic chain of custody form. This testing is performed 24 hours a day in the Hospital Based Laboratories and is resulted within one hour of specimen receipt. The method of testing is a qualitative detection of the major metabolites of the drugs of abuse. The results are used for emergency medical/clinical diagnostic purposes and cannot be used to take legal or punitive action. For non-emergency medical/clinical diagnostic purposes, a more comprehensive non-forensic screen for drugs of abuse is available.

Forensic testing requires a special collection kit containing a chain of custody form, security seals and specimen collection container. Collection of these specimens is done by appointment in several of the MACL Patient Care Centers. Call 317-803-1010/877-803-1010 for locations. The patient must bring a picture ID to confirm patient identification. Patients without proper identification will not be able to be tested. Forensic testing must have a physician's order, agreement with an employer, or a court order before the laboratory can collect the specimen. The specimens are sent out to a reference laboratory for testing.

Note: Forensic screening for drugs of abuse is not performed on an inpatient basis.

Coagulation Specimen Collection and Handling

For coagulation testing to be valid, critical attention must be paid to the collection and processing of these blood samples. These instructions must be followed. Deviation from them will significantly alter the results.

1. If a number of different tubes are to be collected from a patient, the order of the draw of the tubes is as follows:
 - a. Light blue top tubes*
 - b. Serum tubes (gold, red/black, red)
 - c. Green top tubes
 - d. Lavender or pink top tubes
 - e. Gray top tube

*In the event that only light blue top tubes are to be drawn, and a butterfly (winged blood collection) set is being used, a red top tube must first be collected before drawing the blue top tube. This will fill the tubing's dead space to ensure maintenance of the proper blood-to-additive ratio.

2. Venipuncture must be clean with no trauma. Hemolyzed samples are not acceptable.
3. Mix sample gently by inverting the tube(s) 4 times immediately after filling.
4. Deliver specimens to the laboratory within 30 minutes of collection.
5. Tube must be properly filled. The correct ratio of blood to citrate is critical (9:1).
6. Platelet function tests must not be drawn with a butterfly set or in "short draw" light blue top tubes.



Microbiology Specimen Collection and Handling

Introduction

The ability to assess the clinical significance of microbiology laboratory results is dependent upon proper specimen collection, preservation and transport. There is a wide variety of microorganisms found on the body naturally as "normal flora". Specimen collection and preservation procedures are designed to avoid normal flora, if possible, or to at least keep their numbers low. MACL has produced a color pictorial "Microbiology Specimen Transport Guidelines" chart to assist in choosing the appropriate device.

Sensitivities

Antimicrobial susceptibilities are performed as a reflex test on appropriate organisms, whether or not susceptibility is specifically requested. Susceptibility tests are not performed on normal flora, on isolates that have predictable sensitivity patterns, such as beta hemolytic streptococci, or on anaerobes. Most isolates are held for seven days and special requests can usually be accommodated. Please contact the Microbiology Department at (317)803-0050 concerning these requests.

Specimen Site

When submitting a specimen, be specific about the specimen collection site. Do not use terms such as "wound", "swab", "fluid", "tissue", etc. For example, use the term "abdominal wound". This gives the laboratory a much better idea of appropriate methods to use to grow the organisms expected as normal and as pathogenic from that area of the body.

Microbiology Reports

Reports are generated daily on routine cultures and weekly on fungus and acid-fast (AFB) cultures. Fungus cultures are examined for four weeks and AFB cultures for six weeks before reporting as negative.

Unacceptable Specimens

Unacceptable specimens may result in test cancellation or delay. The following is a list of the most common rejection criteria.

1. Mislabeled or unlabeled specimen and/or test request form.
2. Source not stated on test request form.
3. Inappropriate specimen for culture requested (such as an anaerobic culture request on a sputum specimen).
4. Improper specimen container or transport media.
5. Specimen too old (length of time varies with specimen source).
6. Specimens received in expired transport containers.
7. Urine contaminated with stool.
8. Stool contaminated with urine.
9. Diapers with absorbed stool.
10. Viral cultures collected with calcium alginate or wooden shaft swabs.
11. Tissue specimens in formalin.
12. Urine transport tube not filled to minimum line.

Specimens for Anaerobic Culture

Specimens for anaerobic culture must be transported in a container appropriate for the preservation of anaerobes. These transporters generally contain gel. The following specimen types are not appropriate for anaerobic culture due either to the presence of normal anaerobic flora or to the rarity of anaerobic infections from the specimen site.

1. Boil, pustule, decubitus and other superficial wounds
2. CSF
3. Nose, throat swabs
4. Sputum and bronchoscopic specimens (unless obtained by double lumen technique)
5. Feces and rectal swabs, except for Clostridium difficile cultures



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6. Voided or catheterized urine
7. Vagina, cervical, urethral swabs

As a general rule, aspirated fluid or tissue is preferable to a swab. Deep sites are the typical sites for recovery of anaerobes.

Specimens for Viral Culture

1. Always include source of specimen and, when appropriate, type of infection and/or virus suspected.
2. Recovery of virus is improved if the specimen is collected in the acute stage of the illness.
3. Viral, chlamydia, mycoplasma, ureaplasma transport media is available from the laboratory. M₄ media is useful for recovery of any of these organisms. M₄RT media is acceptable for viral culturing and testing only.
4. Collection of specimens for viral culture:
 - a. Respiratory specimen
 - 1) Viruses responsible for respiratory illness in a conscious patient may be collected for viral culture simply with a throat swab. Swab the posterior region of the pharynx with a sterile Dacron swab. **Do not use a calcium alginate or wooden shafted swab, which may be inhibitory to certain viruses.** Break the swab into a viral transport tube immediately after collection. Cap the tube securely and label it. Place the tube in a plastic bag for transport to the laboratory.
 - 2) For an RSV EIA test, nasal washings are preferred. Send nasal washings in a viral transport tube.
 - b. Urine specimen.
 - 1) Collect a clean catch midstream (CCMS) or freshly catheterized urine into a sterile urine cup. Deliver the specimen to the laboratory promptly or refrigerate until delivery.
 - c. Skin lesion specimen.
 - 1) The preferred specimen for skin lesion is an aspirate from a fresh lesion via a 26 or 27 gauge needle attached to a tuberculin syringe. Expel the aspirated fluid immediately into a viral transport tube and cap securely. Label the tube. If the lesion cannot be aspirated, apply a sterile Dacron swab to the lesion and rub vigorously. Break the swab into a viral transport tube and cap securely.
 - d. Tissues or biopsies.
 - 1) Collect fresh tissue from an appropriate site using sterile technique. Each specimen need not be more than 1-2 cm. in diameter.
 - 2) Place in viral transport media.
 - e. Feces/rectal swab.
 - 1) Collect feces in a clean container. Transfer sufficient feces to viral transport vial to make a 20-40% suspension.
 - 2) For rectal swab, insert swab(s) at least three centimeters into anal orifice. Rotate to ensure sufficient fecal specimen on swab. Break swab tip(s) off into viral transport vial.
 - f. Cerebrospinal fluid.
 - 1) If less than 1 ml, send in CSF collection tube. If 1-2 ml, send in viral transport media.
 - g. Blood and serum
 - 1) Except for cytomegalovirus and enteroviruses, blood and serum are usually not productive specimen sources for the isolation of viruses. For isolation of cytomegalovirus from white blood cells (buffy coat), submit fresh blood in heparin. Send 7 ml whole blood at room temperature. **DO NOT REFRIGERATE.** For isolation of enteroviruses from serum (newborns and young children), collect one red-top tube of blood. Separate serum and submit in a plastic screw capped vial.
5. Refrigerate specimens at 2-8° C (except CMV culture from buffy coat) immediately after collection. Do **NOT** freeze.



Blood Culture Collection

1. Labeling
Label all culture bottles with the patient's name, date and collection time, phlebotomist's initials, and site of draw.
2. Timing
We recommend the following guidelines for the timing of the collection of blood cultures and optimal recovery of microorganisms present.

Before the use of systemic antimicrobials, obtain two separate sets of blood cultures. Most often, two separate sets of blood cultures will suffice. More may be required to confirm certain suspected diagnoses.

Systemic and Localized Infections

- Suspected acute sepsis, meningitis, osteomyelitis, arthritis, or acute, untreated bacterial pneumonia: Obtain two sets of blood cultures.
- Fever of unknown origin: Initially, obtain two sets of blood cultures; 24-36 hours later obtain two additional sets of blood cultures. Note: The yield beyond four sets of blood cultures is often negligible.
- Suspected early typhoid fever or brucellosis: Owing to the low-grade bacteremia present in these infections, obtain four sets of blood cultures (the same venipuncture site may be used) over a 24-36 hour period.

Infective Endocarditis

- Acute: Obtain three sets of blood cultures during the first 1-2 hours of evaluation.
- Subacute: Obtain three sets of blood cultures on the first day (ideally 15 or more minutes apart, the same venipuncture site may be used). If all three sets are negative, obtain two additional sets of cultures.
- Culture-negative endocarditis: Consult with the Medical Director, and/or local medical staff after five negative sets of blood cultures. Special culture techniques may be advised.

3. Blood Culture Bottles
Since these cultures are processed using special media and instrumentation, it is necessary to submit all of these cultures in the aerobic and anaerobic bottles supplied by MACL. For children, use a pediatric bottle.
4. Phlebotomy for Blood Cultures
After palpation, scrub the venipuncture site with 70% alcohol or a blood culture skin prep device for a minimum of 30 seconds. Allow to air dry.
 - a. Apply iodine/iodophor (1-2% tincture of iodine or 10% povidone-iodine) for 60 seconds in concentric circles away from the venipuncture site covering an area 1 ½ - 2 inches in diameter. After the puncture site has been decontaminated, do not touch.
 - b. Decontaminate the diaphragm bottle tops by swabbing with 70% alcohol. Allow it to dry. Do not use iodine on the diaphragm tops.
 - c. Using a syringe and needle or a "butterfly" double needle collection system, perform venipuncture and obtain 20 mL of blood (if an adult patient), 10 mL of blood (if a pediatric patient weighing 30-80 lbs.) and inoculate bottles as described below.
 - d. Following venipuncture, remove iodophor that can irritate the skin of patients with 70% alcohol and allow to evaporate.
 - e. Do not overfill bottles. Greater than 12 mL in the adult bottles and greater than 5 mL in the pediatric bottles constitute overfills.
5. Blood Culture Volumes



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Adult—Inoculate 10 mL each into Aerobic and Anaerobic bottles. If you cannot obtain 20 mL of blood, divide as follows:

- Less than or equal to 8 mL: transfer entire amount to Aerobic bottle.
- Greater than 8 mL, but less than 20 mL: transfer 8-10 mL to Aerobic bottle and the remainder to Anaerobic bottle.

Pediatric Patients weighing 30-80 lbs—If you cannot obtain 10 mL of blood, divide as follows:

- Less than or equal to 5 mL: transfer entire amount to a Peds bottle.

Throat Specimen Collection

1. Have the patient sit in an upright position.
2. Ask the patient where their throat hurts most. If the patient is a child that appears to be resistant, it may be helpful to allow the child to sit on the adult's lap and instruct the adult to restrain the child's arms from grabbing the swab.
3. Instruct patient to open mouth and stick out their tongue.
4. Use the tongue depressor to hold the tongue down.
5. Put the swab all the way to the back of the throat, rub in the area of the tonsils and behind them, making sure to touch area the patient says hurts. Move the swab up and down. Touch any white patches in the tonsillar area.
6. Do not rub the roof of the mouth or the tongue.
7. The swab must be saturated for accurate testing.
8. Label the culturette with the patient information. Date, time and initial the specimen. Label the specimen with the source of the collection (throat).

Urine Culture Collection

Submit specimens in urine culture transport tubes. To reduce contamination, the specimen submitted for urinalysis should be a clean catch "midstream" sample.

Patient Collection Guidelines: Clean Catch Midstream (CCMS)

Females:

1. Wash hands using soap and water.
2. Open the collection cup. Do not touch the inside of the cup or the lid.
3. Spread the outer portion of the urinary area and hold apart for collection.
4. Use three wipes to clean the area.
5. Wipe one side, front to back, with first wipe.
6. Wipe other side, front to back, with second wipe.
7. Wipe the center, with third wipe.
8. Urinate into the toilet for a few seconds and stop.
9. Continue to urinate into the cup.
10. Replace the lid on the container. Screw the lid on tightly to prevent leakage.
11. Wash hands.

Males:

1. Wash hands using soap and water.
2. Using one of the antiseptic wipes, clean the end of the penis. Retract the foreskin if needed.
3. Repeat using second wipe.



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4. Open the collection cup. Do not touch the inside of the cup or the lid.
5. Urinate into the toilet for a few seconds and stop.
6. Continue to urinate into the cup.
7. Replace the lid on the container. Screw the lid on tightly to prevent leakage.
8. Wash hands.

Collection Guidelines: Indwelling Catheter.

Obtain the specimen with a needle and syringe. Select the puncture site 1-2 inches away from the catheter tube entry point. Cleanse the area to be punctured with 70% alcohol. Aspirate exactly 5 mL of urine with a sterile needle and syringe. Disinfect the rubber stopper and aseptically transfer the specimen to the urine transport tube provided. Specimens obtained from the collection bag are not suitable for analysis. Foley tips will not be accepted.

Urine Culture Transport

Prevention of contamination by normal vaginal, perineal, and anterior urethral flora is the most important consideration for collection of a clinically relevant urine specimen. (See guidelines above for collection of a urine specimen.) Unpreserved urine is an excellent growth medium for most bacteria. Unless urine is preserved during transport, bacteria may multiply, causing colony counts to be erroneously high. The maintenance medium in the transport kit prevents rapid multiplication of bacteria in the urine during shipment. **Send urine for culture in a gray topped urine tube.**

Instructions for use:

1. Obtain the urine specimen.
2. Open the pouch and remove the transfer device and tube.
3. Submerge the straw of the transfer device to the bottom of the urine container. The container may be tipped at an angle if the volume of urine is limited.
4. Place the transport tube in the holder portion of the transfer device and push it down as far as it will go, puncturing the stopper.
5. Hold the tube and transfer device in position until the urine stops flowing into the tube.
6. Remove the transport tube from the transfer device and shake the tube vigorously.
7. Discard the transfer device and remaining cup of urine into appropriate biohazard disposal containers.

Precaution: The transport tube **must** be filled to the minimum line indicated on the tube. A tube which is not filled at least to this line is unacceptable for culture.

Sputum Specimen Collection

Collect by instructing the patient to remove dentures, rinse mouth, gargle with water and cough deeply, expectorating into appropriate collection container. All specimens labeled "sputum" that are consistent with saliva will be rejected. Rejection is based on observation of cells on a Gram stained smear.



Stool Specimens

Specimens should be submitted in transport media suitable for the test(s) ordered. See individual test listing and the "Microbiology Specimen Transport Guidelines" chart for specific requirements.

Wound Specimen Collection (wound, abscess, burn, exudate)

1. The specimen of choice depends on the extent and character of the infection. An aspirate is always preferred to a swab. A dry swab usually yields results of poor quality.
2. The methods for collection of wound and other skin and tissue collections are as follows:
 - a. Unruptured abscess:
Do not swab. Decontaminate the skin and aspirate contents with a syringe. If possible, submit a portion of the abscess wall after draining the abscess. Submit the specimen in an anaerobic transport container.
 - b. Open lesions:
Remove as much of the superficial flora as possible by decontaminating the skin with skin disinfectant. Remove exudate and sample the margin of the wound using a swab and firm pressure. Do not request anaerobic culture on open, superficial lesions.
3. Be as specific as possible in giving a specific anatomic source. "Wound", "abscess" or "swab" is too general.
4. Transport the specimen to the lab as quickly as possible.

Cerebral Spinal Fluid Specimens

1. Testing for each collection tube should be specified by the ordering physician.
2. If not indicated on orders, the following list will be used

Tube #	Testing
1	Chemistries Glucose Total protein Other tests as ordered
2	Gram stain CSF culture India Ink Cryptococcal antigen Viral culture Fungal culture AFB culture Other tests as ordered
3	CSF cell count Cytology VDRL CSF Other tests as ordered
4	Multiple sclerosis evaluation Neurological immunology Neurological cytomorphology Other tests as ordered



Cytopathology Specimen Collection and Handling

Specimen Collection and Handling

The essence of a successful Cytopathology program depends on both the physician and the laboratory. Obtaining the patient's medical history and a properly fixed, adequate specimen is essential. A final report, using descriptive Cytopathology terminology and an accurate interpretation are required to assure appropriate follow-up. Cytopathology services are offered in partnership with Ameripath of Indiana.

Supplies

We strongly recommend the use of our collection materials (Cytopathology Test Requisitions, liquid-based collection vials, slides, fixatives, endocervical brushes, brooms, spatulas and slide containers).

Ordering Information

Complete a Cytopathology test requisition including:

- Patient's first and last name, social security number or unique identifier and date of birth
- Date of specimen collection
- Source of material submitted (cervical, endocervical, vaginal, or other gynecologic or non-gynecologic site)
- Submitting physician's name, UPIN and telephone number

For GYN Specimens:

- Last menstrual period (LMP)
- Pertinent clinical information (pregnant, postpartum, hormone therapy, oral contraceptives, hysterectomy, postmenopausal, pelvic radiation, etc.)
- History of abnormal cytology, gynecologic surgery, cryosurgery, high risk positive HPV

Specimen Identification

We cannot accept specimens that are not properly labeled per Clinical Laboratory Improvement Amendments (CLIA) regulations.

- Label all slides on frosted end in pencil with patient's first and last name or unique identifier.
- Label specimen containers (on the container wall, not the lid) with the patient's first initial and full last name or unique identifier and site(s) of specimen collected.

Unacceptable specimens*, with rare exception, will be rejected.

***Unacceptable Specimens are defined as:**

- No patient identification on test requisition
- No patient identification on slide or specimen container (Labeling the slide holder only is not adequate identification.)
- No account/physician number or name and none available
- Slides broken beyond repair
- Specimen leaked from container
- Mismatch between name of patient on specimen and name on test requisition
- Inappropriate or incomplete test requisition
- Syringe with needle attached

Specimen Collection Gynecologic

Patient Preparation

- Patient abstains from sexual intercourse for 48 hours prior to the examination



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- Patient abstains from using vaginal medication, vaginal contraceptives, lubricants, or douches for 24-48 hours prior to the examination
- The optimal time for a Pap test is mid-cycle. Menses may interfere with Pap test interpretation

Note: DO NOT USE lubricant on the speculum. The speculum may be moistened with warm water if desired. The use of lubricant may contribute to an increased incidence of unsatisfactory Pap tests. Lubricants may contain ingredients known as "carbomers" or "carbopol polymers" that interfere with liquid-based Pap tests by causing immiscible agglutination of cells.

Image Assisted ThinPrep® Pap Test/ThinPrep® Pap Test

Brush / Spatula Device

1. Complete the test requisition.
2. Record the patient's first and last name or unique identifier on the vial.
3. Obtain an adequate sampling from the ectocervix using a **plastic** spatula.
4. Immediately rinse the spatula in the PreservCyt® Solution vial by swirling vigorously in the vial 10 times, forcibly removing cells by scraping the spatula against the container if necessary. Discard the spatula. **Do not let the spatula sit in the vial.**
5. Obtain an adequate sampling from the endocervix using an endocervical brush device. Insert the brush into the cervix until only the bottom-most fibers are exposed. Slowly rotate 180° clockwise. **DO NOT OVER-ROTATE.**
6. Rinse the brush 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. If material is still visible on the bristles, then scrape the bristles with the spatula staying within the fluid. Swirl the brush vigorously to further release material. Discard the brush. **Do not let the brush sit in the vial.**
7. Tighten the cap so that the torque line on the cap passes the torque line on the vial.
8. Place the vial and requisition in a specimen bag for transport to the laboratory.

Broom-like Device

1. Complete the test requisition.
2. Record the patient's first and last name or unique identifier on the vial.
3. Obtain an adequate sampling from the cervix using a broom-like device. Insert the central bristles of the broom into the endocervical canal deep enough to allow the shorter bristles to fully contact the ectocervix. Push gently, and rotate the broom in a clockwise direction five times.
4. Rinse the broom in the PreservCyt® Solution vial by pushing the broom into the bottom of the vial 10 times, forcing the bristles apart. Swirl the broom vigorously to further release material. If material is still visible on the bristles, then scrape the bristles against the vial staying within the fluid. Swirl the broom vigorously to further release material. Discard the collection device. **Do not let the broom sit in the vial.**
5. Tighten the cap so that the torque line on the cap passes the torque line on the vial.
6. Place the vial and requisition in a specimen bag for transport to the laboratory.

For questions about Non-Gyn collection, requisitions, supplies or test results, please call AmerPath at (317)275-8000.



Instructions for Packaging Specimens and Test Requisitions

1. Collect the specimen(s) in proper transport container. (Refer to the test detail section of the Directory of Services for more information.) Ensure specimen is properly labeled with required patient identification and specimen collection information.
2. Ensure that all specimen container caps and lids are properly tightened to prevent leakage.
3. Fold the top copy (original) of the test requisition in half widthwise (top to bottom) with the patient's name and bar code facing out. Retain the second copy for your files.
4. The specimen bag has two pouches. Place specimen(s) in the rear pouch with the zip lock. Place fully completed paper or electronic requisition in the front pouch with the bar code facing out.
5. ***Frozen specimens must be placed in a separate specimen bag along with a separate requisition. Frozen specimens cannot be split for other tests.***

Proper Specimen Packing Helps Expedite Your Order.