

Sacramento County Public Health Laboratory Alphabetical Test Listing & Collection Manual

Sacramento County Public Health Laboratory (SCPHL) is the first contact for access to reference services of the California State Microbial Disease Laboratory (MDL), Viral & Rickettsial Disease Laboratory (VRDL), and the Centers for Disease Control and Prevention (CDC).

Contact SCPHL at (916) 874-9231 with any questions regarding tests listed in this guide or tests available at MDL, VRDL or the CDC.

Acid Fast Culture and Smear (*M. tuberculosis*, non- MTB mycobacteria, *Actinomyces* & *Nocardia* species)

CPT Code (Method): 87015 (Concentration), 87206 (Microscopy),
87116 (Culture)

Specimen Collection:

- Collect specimens before chemotherapy is started. Even a few days of drug therapy may kill or inhibit sufficient numbers of Mycobacteria to leave confirmation of disease in doubt.
- Collect specimens in clean, sterile, plastic disposable containers. Specimens are refrigerated with the exception of blood, bone marrow and CSF which are stored at room temperature
- Collect a series of three single, early morning sputum specimens on successive days.

Sputum

Sputum is the principle specimen for diagnosis of pulmonary tuberculosis.

To obtain a valid specimen, follow these guidelines:

1. Rinse the mouth with water before sputum is collected to minimize residual food particles, mouthwash, and oral drugs that might contaminate the specimen or inhibit growth of any acid-fast bacilli present.
2. Saliva and nasopharyngeal discharge are not sputum.
3. Collect only the exudative material brought up from the lungs after a deep, productive cough.
4. Early morning specimens, preferably 5 - 10 ml each, should be collected on three consecutive days. A volume of at least 3 ml is desired for testing.

Blood

A sample of 5 - 8 ml may be collected in either of the following sterile anticoagulant Vacutainer® tubes:

- Yellow top containing sodium polyanethol sulfonate (SPS)
- Green top containing sodium heparin

Blood collected in EDTA tubes or coagulated blood are NOT acceptable.

Blood specimens are stored at room temperature if they cannot be immediately transported or processed for testing.

Body Fluids

Collect all fluids in sterile containers with screw-cap lids.

Abdominal fluid (peritoneal, paracentesis, dialysis, bile)	10 - 15 ml
Chest fluids (pleural, thoracentesis, empyema)	10 - 15 ml
Exudates (transudates, drainages, ulcers)	3 - 5 ml
Other fluids (pericardial, synovial, joint)	2 - 3 ml

Bone

For large, clean bone fragments with no tissue attached, add sterile saline to completely cover the specimen and vortex vigorously for 1 - 2 minutes. For large bone fragments with tissue attached, scrape as much tissue as possible from the bone and process the tissue. Cover remaining bone with saline, vortex and inoculate saline to media. Transport and store at room temperature

CSF

As much fluid as possible is aseptically collected by aspiration or during surgical procedures, as only small numbers of organisms may be present. The recommended volume is 2 ml. Transport and store at room temperature.

Gastric Lavage Fluid

Aspiration of swallowed sputum from the stomach may be necessary for patients with minimal disease, infants, young children, and adults who are unable to cooperate with sputum induction procedures.

1. Fasting, early morning specimens are optimal.
2. A volume of 20 - 30 ml is recommended.
3. If the specimen cannot be processed within 4 hours, the collection bottle should contain about 100 mg of sodium carbonate or another alkaline buffer salt. This reduces long-term exposure of any mycobacteria to the stomach acid, which is detrimental to organism recovery and detection.

Stool

Mix 2 grams (marble-size) of stool with 10 ml of saline. Filter with 4 - 6 layers of gauze into a 50 ml centrifuge tube, and submit the tube.

Swabs

Occasionally it is necessary to culture a draining sinus or some other site best sampled by a swab. However, swabs are not optimal for the recovery of mycobacteria because they provide limited surface area for collection, and the hydrophobic nature of mycobacteria often compromises the transfer from the swab to solid or broth media.

Tissue

At least 1 g or 1 mm³ of tissue should be collected into a sterile container without fixatives or preservatives. To protect the tissue from drying, a small amount of sterile saline may be added.

Urine

A series of three, early morning, cleanly voided, midstream specimens collected on consecutive days is superior to a 24 hour pooled specimen. A volume of 15 ml is recommended.

Wounds

Skin lesions, granulomas, ulcers, subcutaneous nodules, or anything related to an extremity may be sampled if the physician suspects *M. marinum* and/or *M. ulcerans*. Aseptically collect as much material as possible.

Transportation and Storage:

Transport specimens to the laboratory at 4°C, within 24 hours. Refrigerate specimens at 4°C if delivery is delayed.

Aptima® - See Chlamydia/Gonorrhea Amplified DNA Assay

Autoclave Sterilization Verification

CPT Code (Method): None (Incubation, interpretation)

Specimen Collection:

Send autoclaved Sporampules along with an unautoclaved ampule from the same lot. Please record the lot number and expiration date of the ampules on the specimen requisition form.

Transportation and Storage:

Transport as soon as possible at room temperature.

Blood Lead (ESA® Lead Care®)

CPT Code (Method): 84655 (Quantitative chemistry)

Specimen Collection:

Use only fresh, whole blood. A sufficient whole blood sample may be obtained from a skin puncture (such as a finger stick) or from venipuncture. Proper preparation of the puncture area is important. The puncture site should be washed and wiped clean with an alcohol wipe or equivalent.

Use only heparin or EDTA as anticoagulants in blood collection tubes. If EDTA collection tubes are used, they must be at least one quarter full; otherwise, falsely lower blood lead results may be obtained. Make sure to properly mix the blood before obtaining the measured sample for the blood lead test. Make sure the blood sample does not contain clots.

Transfer exactly 50 µl of whole blood into the Treatment Reagent tube within 24 hours of collection. Store at 10° to 32°C. Do not refrigerate whole blood prior to mixing with Treatment Reagent. Do not use plasma or serum.

Transportation and Storage:

Whole blood specimens must arrive at the laboratory within 24 hours of collection. Transport whole blood at 10° - 32°C. Specimens in Treatment Reagent should be stored at 4°C and tested within 7 days.

Please remember to fill out the patient's address on the requisition form when submitting blood lead tests.

***Bordetella pertussis* / *parapertussis* Culture & PCR**

CPT Code (Method): 87070 (Culture)
87798 x 2 (Qualitative Polymerase Chain Reaction)

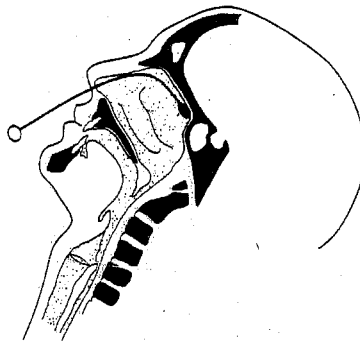
Specimen collection:

Specimens should be collected as soon as possible after onset of symptoms and before antibiotic treatment. This test also detects *B. parapertussis*. Please keep in mind the following guidelines:

- **Cough plates and throat swabs are unsatisfactory.**
- Small tipped Dacron or polyester nasopharyngeal swabs should be used for specimen collection.
- **Calcium alginate swabs are unsuitable for PCR.** Avoid Rayon and cotton swabs because they contain chemicals toxic to *B. pertussis*.
- The rtPCR test for *B. pertussis* was developed and validated by Sacramento County P.H. Lab. It has not been cleared or approved by the Food and Drug Administration (FDA). Results should be used in adjunct to clinical presentation and symptoms.

Collection procedure:

1. Remove the Regan-Lowe deep and bring it to room temperature before collecting specimen.
2. Use a Dacron swab on a flexible wire shaft to sample the nasopharynx (Dacron is preferred for molecular PCR testing). Immobilize the patient's head and gently pass the swab through the nostril into the posterior nasopharynx. A properly collected sample from the posterior area will contain the ciliated respiratory epithelial cells preferred by *B. pertussis*. If resistance is met in the passageway, do no force entry because the patient may have a deviated septum or large turbinate. Try the other nostril.



3. Keep the swab in the nasopharynx for up to 30 seconds or until a coughing paroxysm is induced.
4. Submerge the nasopharyngeal swab (with the collected specimen) into the Regan Lowe medium. Break or cut any portion of the swab that is protruding from the tube and tighten the cap.

Transportation and Storage:

NP swabs are placed in Regan Lowe deeps for transport to the laboratory. **DO NOT REFRIGERATE.** Protect the specimen from excessive heat and extreme cold. Transport to laboratory at room temperature within 24 hours of collection.

***Campylobacter* Isolation / Identification**

CPT Code (Method): 87046 (Specimen prep), 87077 (Culture)

Specimen Collection:

Collect stool and place in the Enteric Collection kit (supplied by the lab), or use a clean, sterile, plastic container. Transfer enough stool into the transport fluid so that the liquid level is raised to the red fill line. Thoroughly mix contents of the vial.

Transportation and Storage:

Transport to the laboratory at room temperature within 24 hours. Maximum transport time is 72 hours at room temperature.

NOTE: Buffered glycerol saline is an **unsatisfactory transport medium** for the isolation of *Campylobacter* sp.

Chlamydia / Gonorrhea Amplified DNA Assay (Aptima®)

CPT Code (Method): 87491 (Chlamydia NAAT), 87591 (Gonorrhea NAAT)

Specimen Collection:

The nucleic acid amplified test (NAAT) is designed to detect the presence of *C. trachomatis* and *N. gonorrhoeae* DNA in clinician-collected endocervical, vaginal, and male urethral swab specimens, and male and female urine specimens.

- The unisex swab is used for both male and female specimens.
- The APTIMA Unisex Swab Specimen Collection Kit for Endocervical and Urethral Swab Specimens and the APTIMA Urine Specimen Collection Kit for Male and Female Urine Specimens are intended to be used only with the GEN-PROBE APTIMA Combo 2 Assay. Performance has not been established with other products.

Instructions for collection:

1. Endocervical swab specimens

- a. Remove excess mucus from the cervical os and surrounding mucosa using the cleaning swab (white shaft swab in the package with red printing). **Discard this swab after use.**
- b. Insert the specimen collection swab (blue shaft swab in the package with green printing) into the endocervical canal.
- c. Gently rotate the swab clockwise for 10 - 30 seconds in the endocervical canal to ensure adequate sampling.
- d. Withdraw the swab carefully; avoid any contact with the vaginal mucosa.
- e. Remove the cap from the swab specimen transport tube and immediately place the specimen collection swab into the transport tube.
- f. Carefully break the swab shaft at the score line; use care to avoid splashing of the contents.
- g. Recap the swab specimen transport tube tightly.

2. Male urethral swab specimens

- a. The patient should not have urinated for at least one hour prior to specimen collection.
- b. Insert the specimen collection swab (blue shaft swab in the package with the green printing) 2 - 4 cm into the urethra.
- c. Gently rotate the swab clockwise for 2 - 3 seconds in the urethra to ensure adequate sampling.
- d. Withdraw the swab carefully.
- e. Remove the cap from the swab specimen transport tube and immediately place the specimen collection swab into the specimen transport tube.
- f. Carefully break the swab shaft at the score line; use care to avoid splashing of the contents.
- g. Recap the swab specimen transport tube tightly.

3. Urine specimens (male or female)

- a. The patient should not have urinated for at least one hour prior to specimen collection.
- b. Direct patient to provide first-catch urine (approximately 20 - 30 ml of the initial urine stream) into a urine collection cup free of any preservatives. Collection of larger volumes of urine may result in specimen dilution that may reduce test sensitivity. Female patients should not cleanse the labial area prior to providing the specimen.
- c. Remove the cap and transfer 2 ml of urine into the urine specimen transport tube using the disposable pipette provided. The correct volume of urine has been added when the fluid level is between the black fill lines on the urine transport tube label.
- d. Re-cap the urine specimen transport tube tightly. This is now known as the processed urine specimen.

Transportation and Storage:

1. Swab specimens:

After collection, transport and store the swab in the swab specimen transport tube at 2° - 30°C until tested. Specimens must be assayed with the APTIMA Combo 2 Assay within 60 days of collection. If longer storage is needed, freeze at -20° to -70°C for up to 90 days after collection.

2. Urine Specimens:

- a. After collection, transport the processed urine specimens in the GEN-PROBE APTIMA urine specimen transport tube at 2° - 30°C and store at 2° - 30°C until tested. Processed urine specimens should be assayed within 30 days of collection. If longer storage is needed, freeze at -20° to -70°C for up to 90 days after collection.
- b. Urine samples that are still in the primary collection container must be transported to the lab at 2° - 30°C. Transfer the urine sample into the APTIMA urine specimen transport tube within 24 hours of collection. Store at 2° - 30°C and test within 30 days of collection.

Clearance: *Salmonella* / *Shigella* Isolation / Identification

CPT Code (Method): 87045 (Specimen prep & culture)

Specimen Collection:

Collect stool and place in the Enteric Collection kit (supplied by the lab), or use a clean, sterile, plastic container. Transfer enough stool into the transport fluid so that the liquid level is raised to the red fill line. Thoroughly mix contents of the vial.

Please fill out a Title 17 submission form for this specimen type.

Transportation and Storage:

Transport to the laboratory at room temperature within 72 hours.

***Cryptosporidium* Detection**

CPT Code (Method): 87207 (Microscopic examination)

Specimen Collection:

Stool specimens stored in 10% formalin are recommended. Prepare the specimen by mixing equal parts feces with 10% formalin, available in the Parasite (O&P) Collection Kit.

Transportation and Storage:

Transport immediately to the laboratory at room temperature.

Culture for Identification (Bacterial, Fungal, Mycobacterial)

CPT Code (Method): 87077 (Culture & biochemical testing)

Specimen Collection:

Please fill out a Title 17 submission form for this specimen type.

Cultures for identification should be submitted on screw-cap agar slants appropriate to the organism. Cultures should be fully grown when submitted, or delays in identification may result.

DO NOT SUBMIT CULTURES FOR IDENTIFICATION ON PLATE MEDIA UNLESS ABSOLUTELY NECESSARY!

IF SUBMITTED, PLATES MUST BE SEALED COMPLETELY WITH TAPE OR THEY MAY BE REJECTED.

Transportation and Storage:

Transport immediately to the laboratory at room temperature.

Dark-field Fresh Exudate Test - Syphilis

CPT Code (Method): 87166 (Microscopic examination)

Specimen Collection:

Please contact the Laboratory BEFORE COLLECTION to make arrangements for test interpretation by a microbiologist.

Collect serous exudate from base of the lesion. Place specimen on a microscope slide with cover slip.

Transportation and Storage:

Specimen **MUST BE READ** within 10 minutes of collection.

Drug Susceptibility (Antimicrobial Susceptibility Testing) (AST)

CPT Code (Method): 87186 (Bacterial isolates)
87188 x 7 (*M. tuberculosis* isolates)

Specimen Collection:

Cultures for drug susceptibility should be submitted on screw-cap agar slants appropriate to the organism. Cultures should be fully grown when submitted, or delays in testing may result. **DO NOT SUBMIT CULTURES ON PLATE MEDIA.**

Please fill out a Title 17 submission form for this specimen type.

Transportation and Storage:

Transport immediately to the laboratory at room temperature.

Enteric Screen: *Salmonella/Shigella/E. coli O157/Shiga Toxin*

CPT Code (Method): 87045 (Specimen prep), 87046 (Culture)

Specimen Collection:

Collect stool and place in the Enteric Collection kit (supplied by the lab), or use a clean, sterile, plastic container. Transfer enough stool into the transport fluid so that the liquid level is raised to the red fill line. Thoroughly mix contents of the vial. If *Vibrio* is suspected notify the laboratory prior to submission of specimen

Transportation and Storage:

1. Store and transport stool specimens in C&S medium at room temperature within 24 hours. Specimens between 24 - 96 hours old may be tested and the results qualified to reflect that excess transit time may affect recovery of enteric pathogens.
2. Specimens in C&S medium, greater than 96 hours old, are unsatisfactory for testing.
3. Unpreserved, fresh specimens must be received within 4 hours of collection. Unpreserved specimens received 4 - 24 hours after collection may be tested and the results qualified. **Unpreserved specimens received more than 24 hours after collection are unsatisfactory for testing.**
4. Multiple stool specimens collected on the same day are acceptable for enteric culture.
5. Buffered glycerol saline is an **unsatisfactory transport medium** for the isolation of *Vibrio* sp.
6. Urine specimens for isolation of *Salmonella typhi* must be received in a sterile screw-top container within 24 hours of collection.
7. **Rectal swabs are generally not satisfactory specimens except for outbreaks of *Shigella* sp.** However, if a patient is unable to submit a stool specimen, a rectal swab may be tested and the results qualified as "scant specimen." Rectal swabs are collected in Amies charcoal transport media, stored at room temperature, and may be tested up to 72 hrs after collection.

REGULATIONS REGARDING ENTERIC PATHOGEN ISOLATION:

Cases of *Salmonella*, *Escherichia coli* O157:H7, typhoid, and *Vibrio* infections must be reported to the local health officer within one working day

from the time the laboratory notifies the health care provider (Title 17, CCR §2500).

A culture of the organisms on which a diagnosis of Salmonellosis is established must be submitted to the local public health laboratory.

Clearance specimens from workers in sensitive occupations (food handlers, children / elder caregivers, and patients in hospitals and other institutional settings) must be submitted to the Sacramento County Public Health Laboratory. Please see the entry for "Clearance: *Salmonella/Shigella*".

Fecal Occult Blood (Hemoccult®)

CPT Code (Method): 82270 (Chemistry)

Specimen Collection:

Stool in a Hemoccult kit. **We cannot test Hemoccult Sensa kits.**

Patient self-collection instructions for Hemoccult specimens:

- For accurate results, apply samples from bowel movements collected on **three different days** to the slide.
- Do not collect a sample if blood is visible in the stool. Contact your doctor.
- For the most accurate results, collect each stool sample before contact with toilet bowl water. Any clean, dry container may be used.
- Return completed slides to the doctor or laboratory no later than 14 days after the first sample collection.
- Protect slides from heat, light, and volatile chemicals (e.g. ammonia, bleach, bromine, iodine, household cleaners).
- For seven (7) days before and during the stool collection period, avoid non-steroidal anti-inflammatory drugs such as ibuprofen (Motrin, Advil), naproxen, or aspirin (more than one adult aspirin a day).
- Acetaminophen (Tylenol) may be taken as needed.
- For three (3) days before and during the stool collection period, avoid:
 - a. Vitamin C in excess of 250 mg a day from supplements, citrus fruits and juices.
 - b. Red meats (beef, lamb, and liver)
- Eat a well-balanced diet including fiber such as bran cereals, fruits and vegetables.

To apply stool specimens to the test slide:

1. Apply a **thin smear** of feces to Box A of the test slide using the applicator provided.
2. Reuse the applicator to apply a **thin smear** of feces from a different part of the stool sample to Box B.
3. Close the cover flap and dispose of the applicator in a waste container.

Transportation and Storage:

Store at room temperature, and transport to the laboratory within 14 days.

Fluorescent Antibody Dark-field (FADF) Test - Syphilis

CPT Code (Method): 87285 (Microscopy w/ fluorescent antibody stain)

Specimen Collection:

Collect serous exudate from base of the lesion onto a clean microscope slide. Use an FADF collection kit (available from the laboratory).

Transportation and Storage:

Specimen is stable if dried – store and transport at room temperature as soon as possible to the laboratory.

Fungal Culture

CPT Code (Method): 87101 (Culture)

Specimen Collection:

Skin, hair and nail specimens should be collected into a sterile container. Thoroughly disinfect the area around skin and nails with 70% alcohol before collection.

Please contact the laboratory for specific instructions, as collection and transport procedures vary widely for various specimen types and suspected etiologic agents.

Transportation and Storage:

Transport skin, hair, and nail specimens in a fungus collection kit; specimens are stable at room temperature.

GeneXpert® Flu – please see Influenza Virus Detection

GeneXpert® MTB/Rif – please see *Mycobacterium tuberculosis*

Gonorrhea Culture Screen

CPT Code (Method): 87081 (Culture screening), 87077 (Pathogen rule-out)

Specimen Collection:

Specimens are collected using a sterile Dacron, rayon or calcium alginate swab. Cotton swabs may contain substances that are toxic to the organism and are not recommended. Acceptable specimens for culture include genital, oral and rectal sites.

Transportation and Storage:

Specimens are inoculated onto a GC pill plate, and immediately placed into a zipper lock bag with a CO₂ generating tablet. The plate should be incubated within 30 minutes at 35° - 37°C, and transported to the laboratory within 72 hours of collection.

Place specimens collected by swab into Amies transport media, and transport at room temperature to the laboratory within 8 hours. GC is viable in Amies transport media for only 8 hours.

Herpes simplex virus 1 & 2 (HSV) Viral Isolation

CPT Code (Method): 87252 (Culture)
 87253 (Microscopy w/ fluorescent antibody stain)

Specimen Collection:

Remove the cap of a fresh vesicle and remove any vesicular fluid if necessary. Using a Dacron swab moistened in saline or transport fluid, vigorously scrape the base of the lesion to collect cellular material. Avoid contamination with blood. Immediately place the swab into transport medium. Vesicular fluid can also be collected and injected into a viral transport tube with a syringe. This test detects both HSV-1 and HSV-2.

Transportation and Storage:

Fasten cap tightly; store and transport at 4°C within 48 hours.

HIV Antibody Screening & Confirmation (Serum / Plasma)

CPT Code (Method): 86701 (Enzyme immunoassay (EIA) screen)
 86689 (Immunofluorescent antibody confirmation)

Specimen Collection:

Serum, plasma, or cadaveric serum specimens may be used in the test. The following anticoagulants have all been evaluated and found to be acceptable: EDTA, sodium and lithium heparin, sodium citrate, CPD, CPDA-1, and ACD.

Cadaveric serum samples may be tested; please contact the laboratory for more information.

Transportation and Storage:

Transport serum and plasma specimens at 2° - 8°C within 7 days. If transport is delayed, specimens should be frozen at -20°C or colder. Specimens should not be used if they have incurred more than 5 freeze-thaw cycles.

HIV Antibody Screening & Confirmation (Oral Fluid)

CPT Code (Method): 86701 (Enzyme immunoassay (EIA) screen)
86689 (Western blot confirmation)

Specimen Collection:

Please refer to the OraSure HIV-1 Oral Specimen Collection Device package insert for full instructions, limitations, and warnings.

1. Open the OraSure HIV-1 package containing the Collection Pad and Specimen Vial.
2. To open the collection package, orient the package so that the “pad” is down and the “stick” end is up.
3. With the thumb and index finger of each hand, simultaneously and symmetrically peel apart (down) the two sides of the packaging far enough to allow easy removal of the Collection Pad.
4. Without touching the contents, present the stick of the device to the patient and instruct the patient to pull it out of the packaging sleeve.
5. Instruct the patient to place the Collection pad in their mouth (pad oriented down) between the lower cheek and gum and gently rub back and forth along the gum line until the pad is moist.
6. Begin timing for two (2) minutes.
7. Instruct the patient to leave the pad stationary against the lower gum for a minimum of two (2) minutes, and a maximum of five (5) minutes.
8. Remove the Specimen Vial from the package and label with patient name, birth date, medical record number, and date and time of collection.
9. Open the vial in an upright position (cap up, pointed tip down) by gently rocking the cap back and forth to avoid spilling the contents.
10. Give the opened vial to the patient, being careful not to spill the contents.
11. At the end of two (2) minutes, instruct the patient to remove the pad from their mouth and insert the pad into the blue liquid in the Specimen Vial, and push the pad all the way to the bottom of the vial.
12. Instruct the patient to break the nylon stick of the pad by snapping it against the side of the vial and in a direction away from anyone nearby. The stick is scored to facilitate breakage.
13. Take the vial from the patient and replace the vial cap, ensuring it is tight. The cap will “snap” into place when secure.

Transportation and Storage:

Transport specimens to the laboratory at 4°C. Specimen vials may be stored at 2° - 37°C for a maximum of 21 days before testing.

Influenza Virus PCR w/ subtyping

CPT Code (Method): 87502 x 2 (rt-PCR), 87503 x 4 (rt-PCR for subtyping)

Specimen collection:

Specimens should be collected as soon as possible after onset of symptoms and before anti-viral treatment. Please keep in mind the following guidelines:

- Nasal aspirates or nasal washes are the preferred specimens. Collect in a sterile, screw-capped container. Bronchoalveolar lavage and tracheal aspirates are also acceptable.
- Close off both ports of Luken's traps and aspiration tubes by securely connecting the vacuum tube to both ports.
- Small tipped Dacron or polyester nasopharyngeal swabs can be used for specimen collection. Swabs may be taken from the throat, nasal passage, or nasopharynx. Both swabs may be placed in the same viral transport container.
- **Swabs with wooden shafts are unacceptable for testing.**
- **Calcium alginate swabs are unacceptable for PCR.**

For suspected avian influenza (A/H5), include one upper respiratory tract specimen (throat swab, nasal swab) and one lower respiratory tract specimen (BAL, tracheal aspirate).

Transportation and Storage:

Specimens should be put into viral transport media and delivered to the laboratory on ice within 48 hours. Freeze the specimen if transport will be delayed beyond 48 hours. Freezing and thawing of specimens should be avoided since this will result in a loss of viability of some viruses, leading to a decreased sensitivity if culture for other respiratory viruses is desired.

Malaria & blood parasites – Thick / Thin Film Blood Smears

CPT Code (Method): 87207 (Microscopic examination)

Specimen Collection:

Please submit the following information with the specimen:

1. Where has the patient been? When was the date of return to the U.S.?
2. Has the patient been diagnosed with malaria before?
3. Has patient ever had a blood transfusion?
4. What medication has the patient received? How often? Last dose?
5. When was the blood drawn? Was patient symptomatic at the time?
6. What is the periodicity of the fever?

Peripheral Blood is best collected between paroxysms and before treatment. Parasites begin to distort within 10 - 12 hours and disappear 2 - 3 days after treatment with chloroquine.

Anticoagulants should be avoided. They interfere with adhesion of blood to the slide, and they interfere with the staining of the parasites.

Blood preserved with EDTA is acceptable, provided that blood films are prepared within one hour.

We accept premade thick and thin film blood smears for malaria confirmation.

Transportation and Storage:

Immediately transport suspected malaria blood smears to the laboratory at room temperature.

Miscellaneous Source Culture - Bacterial

CPT Code (Method): 87070 (Specimen prep & culture)

Specimen Collection:

Miscellaneous source specimens include swabs from the ear, mastoids, accessory sinus, and superficial wounds and lesions.

1. Specimens should be obtained before antimicrobial agents have been administered.
2. Material should be collected where suspected organisms are most likely to be found. The “active” portion of the wound should be sampled.
3. Swabs are not the ideal specimens for wound cultures, but they are most often used. Avoid cotton swabs; they may be toxic to some organisms.
4. When collecting a wound specimen it is important to avoid contaminating the specimen with microorganisms from the skin, mucous membrane or external environment. Detritus and medications should be removed with a sponge soaked in sterile saline followed by 70% alcohol.

Transportation and Storage:

Transport to the lab in Amies charcoal transport media at room temperature within 72 hours.

***Mycobacterium tuberculosis* PCR - GeneXpert MTB/RIFampin resistance**

CPT Code (Method): 87798 (Real-time Polymerase Chain Reaction)

Specimen Collection:

Sputum (induced or expectorated), bronchial specimens (e.g., bronchoalveolar lavage or aspirates) or tracheal aspirates. The efficacy of this test has not been demonstrated using other clinical specimens (e.g., blood, CSF, tissue, urine, or stool). However, we may perform testing of these specimens upon request, and qualify the result with an appropriate note.

The test is performed on patients who are suspected of pulmonary TB based on clinical evaluation and who have not received anti-tuberculosis therapy, have received less than 7 days of such therapy, or have not received such therapy in the last 12 months.

Transportation and Storage:

Specimens must be collected in sterile plastic containers, and stored at 2° - 8°C until transported or processed. Transport specimens to the laboratory within 24 hours.

Norovirus PCR

CPT Code (Method): 87798 x 2 (real-time PCR)

Specimen Collection:

This test is not FDA approved and is for research use only.

Stool specimens should be collected in a clean, sterile container (e.g. urine cup) during the acute phase of illness (48 - 72 hours of diarrhea onset). C&S transport medium may be used if a sterile container is not available.

Transportation and Storage:

Specimens are stored at 4°C, and transport to the laboratory within 7 days of collection. Do not freeze specimens.

Occult Blood – Please see Fecal Occult Blood

Ova & Parasite Screen (O&P) – Intestinal parasite screen

CPT Code (Method): 87177 (Concentration & microscopic examination)
 88313 (Trichrome stain)

Specimen Collection:

Fresh (unpreserved) or formalin preserved fecal specimens are required to detect helminth cysts (eggs) and larvae. Fresh specimens must be examined in the laboratory within 4 hours of passage. In most cases (where the time interval will be longer), multiple specimens will be submitted in 5 - 10% formalin.

Patients should collect 3 separate specimens over a period of 7 – 10 days to maximize recovery of parasites.

Transportation and Storage:

Store and transport at room temperature within 10 days.

Parasitic Arthropod Identification (Ticks, Mites, Spiders, Etc.)

CPT Code (Method): 87168 (Microscopic / macroscopic examination)

Specimen Collection:

Insects, mites, spiders, and ticks suspected of parasitizing a patient may be collected in a clean, sterile, screw-cap container. **Do not add alcohol, formalin, or other preservatives.** Do not kill the arthropod by freezing, CO₂, etc.

Ticks can be identified to determine if they are of the species known to carry Lyme disease. Remove ticks by grasping the tick as close to the skin as possible with fine tweezers. Gently pull the tick away from the skin with a steady motion. Avoid crushing the tick's body.

Transportation and Storage:

Store and transport at room temperature as soon as possible.

Pinworm screen (*Enterobius vermicularis*)

CPT Code (Method): 87172 (Microscopic examination)

Specimen Collection:

Specimens are best obtained an hour or two after the patient goes to sleep or just after waking and before a bath or bowel movement. The paddle's sticky side should be pressed against several areas of the perianal region while spreading open the perianal folds. The paddle is then placed back into the transport tube and the cap tightened. Multiple specimens may be necessary.

Transportation and Storage:

Transport at 4°C within 24 hours. Parasite eggs will deteriorate rapidly in heat. Specimens should be refrigerated at 4°C if examination is to be delayed.

QuantiFERON® (*M. tuberculosis* IFN-γ test – alternative to PPD)

CPT Code (Method): 86849 (Enzyme immunoassay (EIA))

Specimen Collection:

The Quantiferon collection kit uses the following 3 collection tubes:

1. Nil Control (Grey cap)
2. TB Antigen (Red cap)
3. Mitogen Control (Purple cap)

Antigens have been dried onto the inner wall of the blood collection tubes, so **it is essential that the contents of the tubes be thoroughly mixed with the blood.** The test requires live white blood cells, so tubes must be transferred to a 37°C incubator as soon as possible, and within 16 hours of collection.

To ensure valid test results, follow the procedures below:

1. For each subject collect 1 ml of blood by venipuncture directly into each of the Quantiferon blood collection tubes.
2. As 1 ml tubes draw blood relatively slowly, keep the tube on the needle for 2 - 3 seconds once the tube appears to have completed filling, to ensure that the correct volume is drawn.
3. The black mark on the side of the tubes indicates the 1 ml fill volume. Quantiferon blood collection tubes have been validated for volumes ranging from 0.8 to 1.2 ml. If the level of blood in any tube is not close to the indicator line, it is recommended to obtain another blood sample.
4. If a “butterfly needle” is being used to collect blood, a “purge” tube should be used to ensure that the tubing is filled with blood prior to the Quantiferon tubes being used.
5. Mix the tubes by vigorously shaking the tube for 5 seconds ensuring that the entire inner surface of the tube has been coated with the blood. Thorough mixing is required to ensure complete mixing of the blood with the tube’s contents. Label tubes appropriately with patient name or medical record number, date of birth, and date and time of collection.

Transportation and Storage:

Quantiferon collection tubes **must** be transported to the laboratory within 16 hours of collection at ambient temperature (22°C +/- 5°C). **DO NOT REFRIGERATE OR FREEZE!**

Rabies (Non-Human Specimens Only)

CPT Code (Method): None (Microscopic examination w/ fluorescent antibody stain)

Specimen Collection:

Suspected cases of human rabies must be reported IMMEDIATELY to the local health department. We will refer any healthcare provider who suspects human rabies to County Disease Control for evaluation of the situation. Disease Control will provide information, and coordinate action, on specimen collection, contact identification, and preventative prophylaxis for contacts and healthcare workers.

If a patient has had contact or suspected contact with animals that might have rabies, the healthcare provider should contact us for referral to the County Veterinarian. The County Veterinarian will evaluate the situation and provide information as above.

Transportation and Storage:

The County Health Officer or Disease Control will make arrangements for human specimen testing. The County Veterinarian will make arrangements to collect any animals for rabies testing.

Respiratory Virus Screen

CPT Code (Method): 87252 (Culture)
 87253 (Fluorescent antibody stain)

Specimen Collection:

Nasal aspirates or nasal washes are preferred. Nasopharangeal swabs and throat swabs can also be tested. Cotton or Dacron swabs on a plastic or wire shaft are acceptable for testing. **Calcium alginate swabs and swabs with wooden shafts are NOT ACCEPTABLE for testing.**

The following viruses can be detected:

- Adenovirus
- Influenza A & B
- Parainfluenza 1, 2 & 3
- RSV (respiratory Syncytial virus)

Transportation and Storage:

Specimens should be placed in viral transport media and delivered to the laboratory at 4°C within 48 hours.

Freeze the specimen if transport will be delayed beyond 48 hours. Avoid freezing and thawing of specimens, since this will result in a loss of viability for some viruses, leading to decreased test sensitivity.

RPR (Syphilis Screen) - Rapid Plasma Reagin Test

CPT Code (Method): 86592 (Screening), 86593 (Quantification)

Specimen Collection:

Collect venous blood in a 9.5 ml serum separator tube (tiger top Vacutainer®) and allow the specimen to clot before refrigeration.

Transportation and Storage:

Store and transport at 4°C within 8 days of collection.

Rubella Antibody Screen

CPT Code (Method): 86403 (Particle agglutination)

Specimen Collection:

Collect venous blood specimens in a 9.5 ml serum separator tube (tiger top Vacutainer®) and allow the specimen to clot before refrigeration.

Transportation and Storage:

Store and transport at 4°C within 8 days. Separated serum may be frozen at -20°C for long-term storage or if testing will be delayed.

Select Agent Identification / Rule-Out

CPT Code (Method): None (Culture, Biochemicals, PCR)

Specimen Collection:

Collect specimens as appropriate for the source and organism suspected. Please refer to the submission guidelines under “Culture for Identification (Bacterial, Fungal, Mycobacterial)”.

Please fill out a Title 17 submission form with this specimen type.

Transportation and Storage:

Transport as appropriate for the source and organism suspected.

**SPECIAL FEDERAL REGULATIONS APPLY TO REQUESTS FOR
SELECT AGENT RULE-OUT. CALL THE LABORATORY IMMEDIATELY
IF YOU SUSPECT YOU HAVE ISOLATED A SELECT AGENT, BEFORE
SENDING ANY CULTURE ISOLATE.**

Shiga Toxin Test Only – No Culture

CPT Code (Method): 87427 (Enzyme immunoassay (EIA))

Specimen Collection:

Stool specimen submitted in GN or MAC broth.

Transportation and Storage:

Transport within 24 hours at room temperature; store at 4°C if transportation will be delayed longer than 4 days. Please see the “Enteric Screen” entry for culture-specific instructions.

Sputum - Comprehensive Bacterial Culture and Gram Stain

CPT Code (Method): 87070 (Specimen prep & culture), 87205 (Gram stain)

Specimen Collection:

1 - 3 mls of sputum material collected from a deep cough should be submitted in a sterile container. **A specimen that is obviously saliva is unsatisfactory for examination.**

Transportation and Storage:

Specimens may be refrigerated at 4°C up to 24 hours after collection if necessary. Transport to the laboratory at 4°C within 24 hours.

***Streptococcus* Group A Screen**

CPT Code (Method): 87081 (Culture), 87147 (Serogroup)

Specimen Collection:

A sterile swab is rubbed over the tonsillar area and posterior pharynx, and any inflamed or exudative areas. Avoid contact with the tongue or cheek to avoid contamination with normal bacterial flora.

Transportation and Storage:

Survival of streptococci is optimal when silica gel transport media is used. However, Amies transport medium may be used. Transport to the laboratory at room temperature within 24 hours.

Syphilis Testing - please refer to the following tests:

Dark-field Fresh Exudate Test

Fluorescent Antibody Dark-field (FADF) Test

RPR (Syphilis screen)

TPPA (Confirmation for Reactive RPRs)

TP-PA - Confirmation for Reactive RPRs (Syphilis)

CPT Code (Method): 86781 (Antibody agglutination)

Specimen Collection:

Collect serum in a 9.5 ml serum separator tube (tiger top Vacutainer®) and allow to clot before refrigeration. Plasma from tubes using EDTA, sodium citrate or heparin as anticoagulants may be used if serum cannot be obtained.

Transportation and Storage:

Store patient specimens at 2° - 8°C if testing will be performed within 5 days. Specimens can be frozen and thawed once for longer storage. Transport at 4°C.

Urine Culture and Sensitivity

CPT Code (Method): 87086 (Culture & quantification), 87186 (AST)

Specimen Collection:

Clean-catch, midstream urine should be collected to avoid contamination with flora from the urethra, vagina, prostate, or perineum. First-void morning urine should be collected when possible. If specimen transport will be delayed more than 24 hours, a Urine Preservative (UPP) container is available that extends transport time up to 72 hours.

Transportation and Storage:

For best results, urine specimens should be cultured within 2 hours of collection, or stored at 4°C and cultured within 24 hours. Specimens collected in Urine Preservative (UPP) containers should be stored and transported at 4°C, and reach the laboratory within 72 hours.

Varicella-Zoster Virus (VZV) PCR (fresh exudate / scab)

CPT Code (Method): 87798 (Qualitative Polymerase Chain Reaction)

Specimen Collection:

Cellular material from the base of fresh lesions may be used. Basal, parabasal, and intermediate cells scraped from the lesion's base are appropriate samples to collect. Remove the cap from a fresh lesion or vesicle. Using a Dacron swab moistened in saline or transport solution, vigorously scrape the base of the lesion to collect cellular material. Avoid contamination with blood. Place swab in viral transport medium and mix well to dislodge cellular material.

Scabs removed from suspect lesions may also be submitted in a dry sterile container.

Transportation and Storage:

Store and transport to the laboratory at 4°C within 48 hours.

Viral Isolation / Detection (Miscellaneous)

CPT Code (Method): 87252 (Culture)

Specimen Collection:

Please contact the laboratory for information on isolation of viruses not referred to in this document. Specific collection and transport procedures may be required, depending on the organism.

Water Testing – Fecal Coliform Present / Absent (Colilert®)

CPT Code (Method): None (Culture)

Specimen Collection:

Water for testing should be collected according to the Standard Methods For The Examination of Water And Waste Water.

Water samples should be transported to the laboratory at 4°C within 24 hours of collection.

West Nile Virus (WNV) Antibody Screen & Confirmation

CPT Code (Method): 86789 (Enzyme immunoassay (EIA) screen)
 86788 (Immuofluorescent antibody (IFA) confirmation)

Specimen Collection:

Collect venous blood in a 9.5 ml serum separator tube (tiger top Vacutainer®), or collect a plasma specimen in a sterile tube with anti-coagulant. CSF can also be tested; collect at least 0.5 ml in a sterile container.

CSF is tested at the State Laboratory; turn-around time is variable. CSF specimens negative for WNV are also tested for Enterovirus.

Transportation and Storage:

Serum or plasma may be used, and may be stored at 2° - 8°C for up to 5 days. Separated serum may be frozen at -20°C or below for extended periods. CSF must be stored at -20°C, and transported frozen.

Worm Identification

CPT Code (Method): 87168 (Microscopic / macroscopic examination)

Specimen Collection:

Worms should be removed from feces or debris, and placed in a container with sterile saline to maintain moisture.

Transportation and Storage:

Transport to the laboratory at room temperature as quickly as possible; any degradation of the specimen reduces the likelihood of definitive identification.