Public Health Laboratory Specimen Requirements Manual

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Phone: (805) 681-5255

CLIA ID# 05D0683431

Laboratory Director

Debra Ann Palacio

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Specimen Collection and Transport - General Considerations

Note: The Public Health Laboratory is open from 8:00 AM to 5:00 PM Monday - Friday except holidays. Phone 681-5255 in Santa Barbara

Safety Considerations

1. Follow universal precautions treating all specimens as potentially hazardous as required by OSHA Bloodborne Pathogen Regulations.

2. All personnel handling specimens should use appropriate barrier protection including gloves, laboratory coat, gown, protective eyewear, masks as may be necessary.

3. Do not contaminate the external surface of the collection container and/or its accompanying paperwork.

4. Minimize direct handling of specimens in transit from the collection site to the laboratory. Use plastic sealable bags with a separate pouch for laboratory slips or specific transport containers provided by the laboratory. Laboratory slips and other accompanying paperwork should never come into contact with specimens.

General Guidelines for Specimen Collection

1. Clearly label each specimen container with the patient’s name, medical record number, date of birth and date taken. Unlabeled specimens cannot be processed for testing. Fill out one form for each specimen type.

2. HCS-362, the Universal Test Request Form.

The following information must be included.

a. Patient Information: Patient Name, Sex, Date of Birth, Medical Record Number (if applicable), Ordering Physician Name, Submitting Clinic or Laboratory.

b. Physician Information: Ordering Physician (Supervising Physician if applicable).

c. Submitter Information: Name of Submitting Clinic/Lab/Medical Group, Contact Name, Phone, Fax if applicable.

d. Specimen Information: Date Taken, Time Taken (if applicable), Specimen Type.

e. Test(s) Requested: Check box next to test (Multiple tests may be requested on a single specimen. Do not use a single test request form for multiple specimens.

3. Collect specimens before administering antimicrobial agents when possible.

4. Collect specimens in sturdy, leak proof containers that do not create aerosols when opened. Do not use containers which cannot be effectively sealed.

General Guidelines for Specimen Transport

1. Transport all specimens as specified above in item #4 of safety considerations.

2. Transport all specimens for microbial isolation to the laboratory promptly. Check the individual specimen requirements to determine if refrigeration is advisable as some organisms are temperature sensitive. Telephone the laboratory if the proper procedure is in doubt.
3. Microbial cultures submitted by other laboratories for further identification should be submitted in pure culture on the appropriate medium in a sealed, screw-capped tube. Petri plates are generally not acceptable because they cannot be properly sealed for transport.

4. Blood specimens for serological testing should be submitted in vacutainers without anticoagulants. They should be refrigerated at 2 to 8 degrees Centigrade to prevent hemolysis and preserve specimen quality until they are delivered to the laboratory.

5. Serum and cerebrospinal fluid for serological testing should be refrigerated at 2 to 8 degrees Centigrade until they are delivered to the laboratory.

6. All specimens should be protected from temperature extremes during transport. Specimens should not be left in a hot, parked car and should not be subjected to freezing temperatures unless a particular specimen requirement states that a specimen may be frozen.

**Bacteriology**

*Neisseria gonorrhoeae* - specimens for culture.

**General requirements for isolation media**

1. Modified Martin-Lewis plates supplied by the laboratory should be removed from the refrigerator and allowed to reach room temperature before specimens are inoculated.

2. Plates should be checked to determine that they are not dried out, expired or contaminated. Unsatisfactory plates should be discarded.

**Specimen collection - Acceptable specimens for culture.**

1. Specimens should be collected with a sterile swab. Dacron or calcium alginate swabs are preferred.

2. Endocervix - Endocervical specimens for gonorrhea culture should be collected only in medicolegal cases. All other GC specimens except for those from extra-genital sites should be submitted for the amplified DNA assay. See the section on the Chlamydia/GC amplified DNA assay for complete instructions. For suspected gonorrhea or when screening for infection in women, always collect endocervical specimens because they most often yield gonococci in both symptomatic and asymptomatic infections. Use only warm water as a speculum lubricant as other lubricants may be toxic to the gonococcus. After inserting the speculum, wipe away cervical mucus with a cotton ball; then carefully swab the endocervical canal, moving the swab from side to side. Leave the swab in the cervical os for 10 – 30 seconds. Do not use any disinfectant before collecting the specimen, and avoid contaminating the swab with vaginal flora.

3. Urethra – Urethral specimens for gonorrhoea culture should be collected only from asymptomatic males or in medicolegal cases. All other GC specimens except for those from extra-genital sites should be submitted for the amplified DNA assay. See the section on the Chlamydia/GC amplified DNA assay for complete instructions. Collect urethral specimens from symptomatic and asymptomatic males at least 1 hour after the patients have urinated. Purulent discharge can be collected directly on a swab; if there is no discharge, obtain a specimen by gently scraping the mucosa of the anterior urethra with a sterile swab. Insert a male urethral swab 2 cm. into the urethra and rotate the swab gently as it is withdrawn.

4. Anorectal - Collect anorectal specimens from all patients who may have disseminated gonococcal infection. In some instances, gonococci may be isolated from an anal canal culture when the endocervical culture is negative, especially after antimicrobial therapy. Obtain specimens by inserting a swab 4 to 5 cm. into the anal canal. Move the swab from side to side
to sample the crypts. If fecal contamination occurs, discard the swab and use another to obtain the specimen.

5. Oropharynx - When oropharyngeal infection is suspected, swab the posterior pharynx and the region of the tonsillar crypts.

6. Conjunctiva - In infants and others with conjunctivitis, obtain swabs of conjunctival exudate for culture.


1. Smear preparation - If smears are prepared for gram staining and microscopic examination, a swab should be gently rolled over the surface of the microscope slide in one direction only. Three to four complete, non-overlapping rolls of the swab are sufficient. This method minimizes distortion and breakage of polymorphonuclear leukocytes and preserves the characteristic appearance of the microorganisms. Smears should not be excessively thick as they will not stain properly.

\textit{Neisseria gonorrhoeae} - Specimen transport requirements (for asymptomatic males, extragenital specimens and medicolegal cases only.)

1. Specimens for culture - Swabs should be inoculated onto modified Martin-Lewis medium immediately. The CO₂ tablet should be removed from the foil packet and placed in the well of the plate. The plate should be placed in the plastic bag supplied by the laboratory and the bag sealed immediately. The sealed plate should be placed in a 35 degree Centigrade incubator or transported to the laboratory no later than \textbf{20 minutes} from the time the specimen is taken. Gonococci are extremely sensitive to environmental conditions and require a temperature of 35 to 37 degrees Centigrade and an atmosphere containing 3 to 10% CO₂. Note that no CO₂ is produced until the sealed plate is placed in the incubator. Do not place the laboratory slip inside the sealed plastic bag with the plate. Specimens should never come into contact with the laboratory slips.

\textbf{Note:} For Juvenile Hall and Los Prietos Boys’ Camp where incubators are not available, the laboratory will provide swabs containing a transport medium, Amies medium with charcoal. After taking the specimen, the swab should be inserted into the sleeve containing the transport medium and transported to the laboratory within 24 hours. \textbf{Do not refrigerate.}

2. Specimens for direct examination - Slides for Gram staining and microscopic examination should be transported in slide containers that minimize the chance of breaking. Slides should not come into contact with the accompanying laboratory slip.

\textit{Neisseria gonorrhoeae} - Unacceptable Specimens

1. Specimens which have been exposed to temperature extremes (eg. delivered in an ice chest or exposed to high temperature in a closed car).

2. Specimens inoculated onto Martin-Lewis plates that are desiccated, contaminated or expired.

3. Any specimen that is not labeled with the patient’s name, medical record number or other clear means of identification.

4. Cultures received on Martin-Lewis pill-pocket plates without a pill.

5. Swabs in Amies/charcoal transport medium older than 24 hours.

6. Swabs in Amies/charcoal transport medium that have been refrigerated.
Enteric Bacteriology Specimens
Fecal Specimens - for the isolation of Salmonella, Shigella, Campylobacter, Escherichia coli O157, Yersinia enterocolitica and Vibrio species.

Specimen Collection - Acceptable specimens for culture.

1. Do not contaminate with urine.
2. Select portions containing pus, blood or mucus.
3. Add 1 to 2 grams of fecal material (about the size of nickel) to the container of modified Cary-Blair transport medium supplied by the laboratory. Thoroughly mix the specimen with the ‘spork’ attached to the cap of the container.
4. Rectal swabs should always be submitted in modified Cary-Blair transport medium.
5. Fresh (unpreserved) stool should be submitted only if the specimen can be delivered to the laboratory within 2 hours. Phone the laboratory if you are submitting more than 5 specimens so that arrangements can be made to inoculate the fresh specimen onto appropriate culture media immediately.
6. Do not use the modified Cary-Blair container if the phenol red indicator has turned yellow due to failure of the buffering system. Always check to assure the Cary-Blair transport container contains red buffer & is not expired!

Specimen transport requirements for fecal specimens.

1. Fecal specimens preserved in modified Cary-Blair should be stored at 4 to 6°C. and may be transported in an ice chest or at moderate room temperature within 24 hours. Note: specimens which may contain Shigella sp. must not be refrigerated.
2. Unpreserved fecal specimens must be transported to the lab within 2 hours of collection.

Unacceptable fecal specimens.

1. Unpreserved specimens > 2 hours old.
2. Preserved fecal specimens with yellow phenol red indicator due to failure of the buffering system.
3. Dry rectal swabs.
4. Any specimen which is not labeled with the patient’s name, medical record number or other clear means of identification.
5. Any specimen received in a container of modified Cary-Blair transport medium which has expired.
6. Specimens greater than 2 days old or up to 4 days old for Salmonella sp.

Microbiology Specimens
**Bacteriology**

**Bordetella pertussis**

Upper Respiratory Specimens for the isolation of Bordetella pertussis, Bordetella parapertussis and Bordetella bronchiseptica.

**Specimen collection** - Acceptable specimens for culture

1. Nasopharyngeal swab - this is the specimen of choice for the isolation of these organisms. A small tipped Dacron (synthetic) swab is suitable for collection.
   a. The nasopharyngeal swab should be firmly rolled over 1/3 of the surface of a Regan-Lowe charcoal agar plate. The plate should be delivered immediately to the laboratory or placed in an incubator at 35° C until transport can be arranged.
   b. Regan-Lowe charcoal agar is usually available from the laboratory on the same day it is requested. If the specimen must be taken immediately, see specimen transport requirements for further instructions.
   c. Regan-Lowe deeps are supplied by the laboratory should be used when plates are not available or expired. Collect the Dacron NP swab and stab into the deeps, cut the wire with a scissor, cap loose and submit at room temperature within 24 hours or incubate overnight at 35ºC then submit at room temperature as soon as possible.
   d. The nasopharyngeal swab can be submitted in Amies with charcoal and submitted within 24 hours at room temperature.
2. Cough Plates are acceptable only when submitted in addition to a nasopharyngeal swab.
3. Throat swabs are acceptable only when submitted in addition to a nasopharyngeal swab.

**Specimen transport.**

*Culture - Bordetella pertussis* is a slow growing organism that is highly susceptible to drying. If it is not possible to deliver the specimen to the laboratory immediately or to incubate in a 35° C incubator, phone the laboratory for additional instructions because the choice of transport medium is dependant on the anticipated delay between collection and plating. **Do not refrigerate.**

**Unacceptable specimens for the isolation of Bordetella spp.**

1. Cotton or Rayon swabs must be avoided because they contain fatty acids toxic to *Bordetella pertussis*. Calcium alginate swabs should be avoided because they cannot be used for PCR testing.
2. Dry swabs.
3. Cough plates submitted without a nasopharyngeal specimen.
4. Throat swabs submitted without a nasopharyngeal specimen.

**Microbiology Specimens**

Bacteriology

**Corynebacterium diphtheriae**

Upper respiratory specimens for the isolation of *Corynebacterium diphtheriae.*
Specimen collection - Acceptable specimens.
1. Throat and nasopharyngeal swabs are both required in cases of respiratory illness. Any routine sterile swab may be used because this is not a fastidious organism.

Specimen transport
1. Sterile swab systems with silica gel are recommended if there will be a long delay before the specimen reaches the laboratory. (>24 hrs)

Unsatisfactory Specimens
1. Specimens not meeting general specimen requirements.

Microbiology Specimens

Mycobacteriology
Specimen collection - Acceptable specimens.
1. See the chart on the following page for information on collection of specimens for the isolation of Mycobacteria.

Note: Only respiratory specimens such as sputum, bronchial washes, and transtracheal aspirates are acceptable specimens for the direct Nucleic Acid Amplification assay for *Mycobacterium tuberculosis* complex.

Specimen transport
1. All specimens must be submitted in closed containers inside specimen transport bags supplied by the laboratory. Laboratory slips must be placed in the separate pouch on the specimen transport bag so that they do not become contaminated with specimen material.

2. Transport specimens to the laboratory as soon as possible to avoid overgrowth of contaminating organisms. Specimens which cannot be transported immediately should be refrigerated. Transport in a cooler on wet ice if transport time is more than 2 hours.

*See next page for chart*

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<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Specimen Requirements</th>
<th>Special Instructions</th>
<th>Unacceptable Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abscess Contents &amp; Wound Aspirate</td>
<td>As much fluid as possible in a sterile container</td>
<td>Aspirate fluid with a syringe. Express fluid into a sterile container. Use swab if QNS for aspiration.</td>
<td>Dry swab - if a swab is used, keep moist with sterile saline or broth.</td>
</tr>
<tr>
<td>Specimen Type</td>
<td>Collection &amp; Preservation Requirements</td>
<td>Handling &amp; Storage Requirements</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Blood</td>
<td>Blood in Myco/F-Lytic Medium (Supplied by the lab)</td>
<td>Transport to lab within 1 hour</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any blood specimen not collected in Myco/F-Lytic medium</td>
<td>Specimen volume &lt; 2.0 ml</td>
<td></td>
</tr>
<tr>
<td>Body Fluids</td>
<td>10 - 15 ml in sterile container</td>
<td>Specimen in formalin</td>
<td></td>
</tr>
<tr>
<td>Bone</td>
<td>Bone in sterile container</td>
<td>Add no fixative/preservative</td>
<td></td>
</tr>
<tr>
<td>Bone Marrow</td>
<td>1.5ml in pediatric isolator tube</td>
<td>Mix tube contents immediately</td>
<td></td>
</tr>
<tr>
<td>Bronchial Washings</td>
<td>5 - 10 ml in a sterile container</td>
<td>Avoid contamination of specimens with tap water</td>
<td></td>
</tr>
<tr>
<td>Cerebrospinal Fluid</td>
<td>1 - 2 ml in a sterile container</td>
<td>Specimen volume &lt; 2.0 ml</td>
<td></td>
</tr>
<tr>
<td>Gastric Lavage</td>
<td>5- 10ml in a sterile container neutralized with sodium carbonate.</td>
<td>Collect fasting early-morning specimen on 3 consecutive days. Adjust to neutral pH with 100 mg of sodium carbonate. Add within 4 hours of collection.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Specimen that has not been neutralized. Within 4 hours of collection.</td>
<td>Specimen volume &lt; 2.0 ml</td>
<td></td>
</tr>
<tr>
<td>Lymph Node</td>
<td>Node or portion in sterile container without fixative or preservative.</td>
<td>Collect aseptically. Select caseous portion of node if available. Do not immerse in fluid, wrap in gauze or freeze.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Specimen submitted in fixative or preservative.</td>
<td>Specimen submitted in fixative or preservative.</td>
<td></td>
</tr>
<tr>
<td>Skin Lesion Material</td>
<td>Biopsy material or aspirate in sterile container without fixative or preservative.</td>
<td>Collected biopsy sample or aspirate from the periphery of a cutaneous ulcer. Submit swab in transport medium only if biopsy/aspirate not available</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Specimen submitted in fixative or preservative.</td>
<td>Dry swab without transport medium.</td>
<td></td>
</tr>
<tr>
<td>Sputum</td>
<td>5- 10 ml in sterile, disposable container.</td>
<td>Collect an early-morning specimen from deep, productive cough on 3 consecutive days. If specimens must be transported by courier, add sodium carbonate provided by the laboratory.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Specimen volume &lt; 2.0 ml 24 hour pooled specimens, saliva</td>
<td>Specimen volume &lt; 2.0 ml</td>
<td></td>
</tr>
<tr>
<td>Stool</td>
<td>&gt; 1 gram in sterile, wax-free container.</td>
<td>Collect specimen directly into container. Do not contaminate with water from toilet bowl.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen specimen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tissue Biopsy &amp; Wound</td>
<td>&gt;= 1 gram in a sterile container without fixative or preservative.</td>
<td>Collect aseptically avoiding contamination with normal microbiota. Do not immerse in fluid, wrap in gauze or freeze. Do not add fixative/preservative</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Specimen submitted in fixative or preservative.</td>
<td>Specimen submitted in fixative or preservative.</td>
<td></td>
</tr>
<tr>
<td>Transtracheal Aspirate</td>
<td>5 - 10 ml if possible</td>
<td>Collect first morning, midstream or catheterization specimen.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 - 20 ml in sterile container</td>
<td>24 hour pooled specimen</td>
<td></td>
</tr>
<tr>
<td>Urine</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Microbiology Specimens**

**Mycology**

**Specimen collection - Acceptable specimens**

1. See the chart below for specimen collection information.
Specimen transport

1. Transport specimens to the laboratory as soon as possible in sterile, humidified containers - only skin scrapings and hair should be transported dry.

2. Hold dermatological specimens at room temperature until processed in the laboratory.

3. Refrigerate non-dermatologic specimens if transport or processing are delayed more than a few hours.

Unacceptable specimens

1. See chart

### Mycology Specimens - Specimen Requirements Table

<table>
<thead>
<tr>
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<th>Unacceptable Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abscess Contents &amp; Wound Aspirate</td>
<td>Available specimen material in a sterile container</td>
<td>Using a sterile scalpel, express pus and place in sterile container. Use sterile swab if necessary.</td>
<td>Dry swab</td>
</tr>
<tr>
<td>Body Fluids</td>
<td>1 - 2 ml in sterile container if possible</td>
<td>Collect specimen aseptically.</td>
<td>Specimens not meeting general specimen requirements</td>
</tr>
<tr>
<td>Cerebrospinal Fluid</td>
<td>1 - 2 ml in sterile container</td>
<td>Place hairs in sterile petri dish or clean envelope</td>
<td>Specimens not meeting general specimen requirements</td>
</tr>
<tr>
<td>Hair</td>
<td>Select infected area and epilate at least 10 hairs.</td>
<td>Collect whole nail or clippings and place in sterile petri dish or clean envelope.</td>
<td>Specimen not meeting general specimen requirements</td>
</tr>
<tr>
<td>Nail</td>
<td>Whole nail or nail clippings</td>
<td>Scrape entire lesion with sterile scalpel. Contact lab to obtain culture medium for direct inoculation or submit in a sterile petri dish.</td>
<td>Specimen not meeting general specimen requirements</td>
</tr>
<tr>
<td>Skin</td>
<td>Skin scrapings in clean container or inoculated on proper culture medium</td>
<td>Specimen not meeting general specimen requirements</td>
<td></td>
</tr>
<tr>
<td>Sputum</td>
<td>5 - 10ml in a sterile container</td>
<td>Specimen from first-morning, deep cough or induced by aqueous aerosol</td>
<td>Saliva</td>
</tr>
<tr>
<td>Tissue</td>
<td>1 gram of tissue if possible in a sterile container</td>
<td>Collect aseptically from center and edge of lesion. Add a small amount of sterile saline if necessary to keep tissue moist. Refrigerate for no more than 8 hours before transport and processing.</td>
<td>Specimens submitted in fixative or preservative.</td>
</tr>
</tbody>
</table>

Microbiology Specimens

Reference Cultures

Note: Enter all requested information on the Public Health Laboratory Culture for Identification form.

Acceptable specimens - Reference Cultures

1. All cultures submitted to the laboratory for identification must be pure cultures submitted on appropriate culture media. Specimen information should include the date specimen was taken,
conditions of incubation, type of culture medium used and submitter’s identification of the organism.

2. Patient information should include name, gender, date of birth, medical record number and name of physician.

3. Clinical information should include a brief clinical history giving date of onset, symptoms and treatment if any.

**Specimen transport**

1. Cultures should be submitted to the laboratory on solid medium in a screw-capped tube. Avoid transporting liquid culture media if possible to avoid leaking specimens.

2. Culture tubes should be placed in a specimen transport bag with the laboratory slip in the separate pouch.

3. Do not submit cultures in petri plates to avoid the possibility of leakage, breakage or contamination with spores. Phone the laboratory before submitting any culture on a plated medium.

4. Avoid extreme heat during transport. Some cultures may be refrigerated during transport, however, suspected cultures of *Neisseria gonorrhoeae* should not be refrigerated or transported in a cooler.

**Unacceptable specimens**

1. Mixed cultures

2. **Cultures of Coccidioides immitis, Histoplasma capsulatum and Blastomyces dermatitidis** must not be submitted on plated media. Phone the laboratory before submitting cultures of these organisms if you do not have tubed media available.

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**Chlamydia / Gonorrhea NAAT Assay**

1. **Cervical Specimens**
   a. Remove excess mucus from the cervical os and the surrounding mucosa using the white shaft cleaning swab provided in the unisex specimen collection kit and discard.
b. Insert the **blue shaft** swab from the collection kit into the endocervical canal about 1 - 1.5 cm until most of the tip is inside the cervical opening. Rotate the swab clockwise for 10 - 30 seconds in the endocervical canal to ensure adequate sampling.

c. Withdraw the swab carefully. Avoid contact with the vaginal mucosa.

d. Remove the cap from the transport tube and immediately place the specimen collection swab into the transport tube. Carefully break the swab shaft at the scoreline. Re-cap the swab specimen transport tube tightly.

e. Label the tube with patient information and the date collected.

2. Urine Specimens

   a. The patient should not have urinated within one hour prior to sampling.

   b. Collect specimen in sterile, preservative- free urine cup.

   c. The patient should collect the first 20 – 30 ml of voided urine (the first part of the stream – NOT midstream). Specimen volume must be at least 20 ml. Female patients should not cleanse the labial area prior to providing the specimen.

   e. Remove the cap and transfer 2 ml of urine into the urine specimen transport tube using the disposable pipette provided. **Urine volume must be between the 2 black lines on the urine specimen transport tube label.** **DO NOT OVER FILL**

   f. Discard the transfer pipet. Use a new transfer pipet for each specimen. RE-cap the urine specimen transport tube tightly.

### Chlamydia / Gonorrhea Specimens

**Chlamydia trachomatis / Neisseria gonorrhoeae NAAT Assay**

**Unacceptable specimens**

1. Cervical specimens
a. Specimens collected with any device other than the swabs provided in the BD Culturette Direct and transport kit.
b. Any specimen not received in the laboratory in time to test within the 6 day limit from the date of collection

2. Urine specimens. (Chlamydia trachomatis NAAT Assay)
   a. Clean catch urine specimens.
   b. Urine specimens with a volume above or below the black lines on the UPT specimen tube.
   c. Any specimen not received in the laboratory in time to test within the 30 day limit from the date of collection

Parasitology

*Ova & Parasite Testing for Intestinal Parasites*

**Specimen Collection - Acceptable specimens**

1. Collect all specimens prior to the administration of antibiotics, antihelminthic or anti-diarrheal medications. Avoid the use of mineral oil, bismuth or barium prior to fecal collection. These substances may interfere with the detection of intestinal parasites.

2. Use appropriate methods to avoid contamination of the specimen with urine or toilet water.

3. Using the spoon included in each of the collection vials, select a portion of the stool specimen (about 1 teaspoon of material) and add to the collection vial until the liquid reaches a point just below the fill line. Samples should be taken from any area that is bloody or mucoid. Use the spoon to mix the specimen with the preserving fluid in the collection vial.

4. Tighten the caps on both vials securely and shake the vials vigorously until the specimen is thoroughly mixed with the preserving fluid.

**Specimen Transport**

1. Be certain that the caps are securely tightened on each vial. Place both vials in the specimen transport bag.

2. Do not wrap the laboratory slip around the specimen vials. Place the vials in a specimen transport bag and put the laboratory slip in the separate pouch.

3. Transport the specimens to the laboratory as soon as possible. Refrigeration is not necessary for preserved specimens.

Fecal Specimens for the Detection of Intestinal Parasites

**Unacceptable specimens**

1. Specimens not mixed with preservative. If the specimen material is not thoroughly mixed with the preservative at the time of collection, parasites present in the specimen may degenerate preventing detection and identification.

2. Specimens in which the collection vials have been over-filled. If too much specimen is added to the collection vials, the quantity of preservative present may be insufficient to preserve any parasites that may be present.
3. Specimens with insufficient quantity.

**Cellulose Tape Preparation for the Detection of Pinworm**

**Specimen Collection - Acceptable specimens**

1. The eggs of *Enterobius vermicularis* are not usually found in the feces. The adult female migrates out the anal opening at night and deposits the eggs on the perianal skin.

2. Place a strip of clear cellulose tape (adhesive side down) on a microscope slide as follows:
   - starting about ½ inch from one end, run the tape toward the same end and wrap the tape around the slide to the opposite end. Tear the tape even with the end of the slide. Attach a label to the tape at the end torn flush with the slide.

3. To obtain a sample from the perianal area, peel back the tape by gripping the labeled end, and, with the tape looped (adhesive side outward) over a wooden tongue depressor that is held firmly against the slide and extended about 1 inch beyond it, press the tape firmly against the right and left perianal folds.

4. Smooth the tape back on the microscope slide adhesive side down.

5. Label with patient name and date.

6. Pinworm paddle collection kits may be used and are available upon request.

**Specimen Transport**

1. Submit the specimen to the laboratory in a cardboard slide mailer and place in a plastic specimen transport bag.

**Unsatisfactory Specimens**

1. The eggs of *Enterobius vermicularis* are not normally found in stool, therefore, stool specimens are unsatisfactory for the detection of this parasite.

2. The cellulose tape preparation will be examined under a microscope. Excessive amounts of fecal matter adhering to the cellulose tape make microscopic examination impossible.

**Blood Parasites**

**Specimen Collection - Acceptable Specimens**

1. Thin Blood Films
   - Using universal precautions, place a drop of fresh, whole blood on a clean microscope slide about ½ inch from the end.
   - Holding a clean, glass slide at a 45° angle, place the slide in contact with the spot of blood on the first slide and smear the blood smoothly and evenly toward the opposite end of the slide.
   - Label the slide with the thin smear and allow to air dry for at least 10 minutes.
   - Fix the smear by dipping in absolute methanol and allowing it to dry in a vertical position. (The Public Health Lab can provide the methanol fixative.)

2. Thick Blood Films
   - Using universal precautions, place a drop of fresh, whole blood in the center of a clean glass microscope slide about ½ inch from the end.
b. Using the corner of a clean glass slide or an applicator stick, spread the blood into a circle about the size of a dime.

c. The smear should be of a thickness that allows newsprint to be just barely readable through the smear. Add more blood if the smear is too thin or spread the film thinner as above if it is too thick.

d. **Do not fix the thick film**

*Parasitology*

Specimens for the Detection of Blood Parasites

**Specimen Transport**

1. Slides should be transported in a slide mailer or other secure container that will prevent breakage.

**Unsatisfactory Specimens**

1. Thick blood films which have been fixed in methanol
2. Smears made from blood containing anticoagulants if the blood is more than 1 hour old when the smears are made.

*Serology*

<table>
<thead>
<tr>
<th>Test</th>
<th>Acceptable Specimens</th>
<th>Specimen Transport</th>
<th>Unacceptable Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RPR</strong></td>
<td>5 - 10 ml of whole blood (gold top tube) sufficient to yield a minimum of 0.5 ml of clear serum</td>
<td>Specimens not delivered to the laboratory on the day of collection should be refrigerated at 2º – 8º C</td>
<td>Specimens contaminated with bacteria or extensively hemolyzed are not satisfactory for testing</td>
</tr>
<tr>
<td><strong>FTA</strong></td>
<td>5 - 10 ml of whole blood (gold top tube) sufficient to yield a minimum of 0.5 ml of clear serum</td>
<td>Specimens not delivered to the laboratory on the day of collection should be refrigerated at 2º – 8º C</td>
<td>Specimens contaminated with bacteria or extensively hemolyzed are not satisfactory for testing</td>
</tr>
<tr>
<td><strong>VDRL</strong></td>
<td>Minimum of 0.5 ml of cerebrospinal fluid free from bacterial contamination and blood</td>
<td>Specimens not delivered to the laboratory on the day of collection should be refrigerated at 2º - 8º C</td>
<td>Specimens contaminated with bacteria or containing blood are not satisfactory for testing</td>
</tr>
<tr>
<td><strong>(CSF Only)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rubella</strong></td>
<td>5 - 10 ml of whole blood (gold top tube) sufficient to yield a minimum of 0.5 ml of clear serum</td>
<td>Specimens not delivered to the laboratory on the day of collection should be refrigerated at 2º - 8º C</td>
<td>Specimens contaminated with bacteria or extensively hemolyzed are not satisfactory for testing</td>
</tr>
<tr>
<td><strong>HIV</strong></td>
<td>5 - 10 ml of whole blood (red top tube) sufficient to yield a minimum of 0.5 ml of clear serum. Plasma is acceptable</td>
<td>Specimens not delivered to the laboratory on the day of collection should be refrigerated at 2º - 8º C</td>
<td>Specimens contaminated with bacteria or extensively hemolyzed are not satisfactory for testing</td>
</tr>
</tbody>
</table>
Polymerase Chain Reaction (PCR) Tests

**PCR for Norovirus**

*General Requirements:*

Stool specimens should be obtained during the acute phase (within 24-72 hours of diarrhea onset). Liquid or semisolid stool can contain the highest level of viral excretion. A minimum of four (4) to a maximum of ten (10) specimens from acutely ill persons can be submitted for each event. The laboratory submittal form must include the name of facility as well as dates taken and onset of diarrhea.

**Specimen Collection - Acceptable Specimens**

In a plastic, screw-capped urine container, collect 1 to 2 teaspoons fresh liquid or semisolid acute stool. Properly label with the name of the patient and date collected.

**Specimen Storage and Transport**

Stool specimens should be stored and transported refrigerated (4° C) to the laboratory within 2-3 weeks.

**Unacceptable specimens**

PCR testing will generally not be performed if less than 4 specimens are submitted per outbreak facility.

**PCR for Influenza virus**

*General Requirements:*

Respiratory specimens for Influenza virus PCR testing should be collected within 3 to 7 days from the onset of symptoms. If a suspect case of Avian Influenza A (H5N1) lower respiratory specimens are collected in addition to nasopharyngeal, and throat swabs in viral transport medium. If a novel (swine H1N1) is suspected a nasopharyngeal synthetic swab in viral transport is the best specimen.

**PCR for Influenza virus**

*Specimen Collection - Acceptable Specimens*

Respiratory specimens with a minimum of 1 ml including bronchoalveolar lavage, tracheal aspirates, sputum, and nasopharyngeal or oropharyngeal aspirates.
**Dacron swabs** from nasopharyngeal or oropharyngeal sites should be immediately transferred into viral transport medium (3 mls).
If Avian Influenza is suspected, collections of only nasopharyngeal and nasal swabs are **not** recommended.

**Specimen Storage and Transport**
- Store and transport refrigerated (4°C) to the laboratory within the same or next working day, freeze if there is a delay greater than 3 days to delivery.

**PCR for Influenza Virus**

**Unacceptable specimen:**
- Specimen not refrigerated
- Insufficient volume of less than 0.5 ml
- Swabs with calcium alginate or cotton tips and wooden shafts.
- Incomplete labeling/documentation

**PCR for Bordetella pertussis**

**General Requirements - Acceptable Specimens**
- Collect nasopharyngeal swabs during the acute phase of illness within 3 to 5 days of the onset of symptoms.

**Nasopharyngeal swabs are the preferred specimen for this assay. Only Dacron swabs can be used for specimen collection. Immediately after collection, place the swab into a Regan-Lowe transport media at room temperature. The swab handle can be cut with scissors before screwing the cap on the transport tube. Synthetic NP swabs in Amies Charcoal transport is an acceptable alternative.**

**Specimen Storage and Transport**
- Hold and ship the Dacron swab in Regan-Lowe transport at room temperature within the day. If the specimen is delayed overnight or weekend incubate at 35°C and transport at room temperature.

**Unacceptable Specimens**
- Calcium alginate swabs (Calcium alginate inhibits DNA amplification)
- Regan-Lowe (charcoal blood agar) tubes that have been refrigerated after inoculation.

*see next page for PCR testing Summary Table*
## PCR Testing - Summary Table of Specimen Requirements

<table>
<thead>
<tr>
<th>Test</th>
<th>Acceptable specimen</th>
<th>Specimen Storage and Transport</th>
<th>Unacceptable Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Norovirus</strong></td>
<td>Fresh acute (3-5 days from onset) stool (1-2 tsp) in a 100ml urine container. 4-10 stool/facility</td>
<td>Refrigerate in storage and transport</td>
<td>Less than 4 stool specimens/ outbreak facility</td>
</tr>
<tr>
<td><strong>Influenza virus</strong></td>
<td>Acute (3-5 days from onset) Lower respiratory specimens (sputum, bronchoalveolar lavage, tracheal aspirate or pleural fluid). Nasopharyngeal/Oropharyngeal with Dacron (synthetic) swab in viral transport medium</td>
<td>Refrigerate in storage and transport</td>
<td>Specimen not refrigerated Insufficient volume viral transport media(&lt;0.5 ml) Calcium alginate, cotton tipped swabs or wooden shafts</td>
</tr>
<tr>
<td><strong>Bordetella pertussis</strong></td>
<td>Acute (3-7 days from onset) Nasopharyngeal Dacron swab in Regan-Lowe transport media</td>
<td>Ship at room temperature, if held over-night incubate at 35°C</td>
<td>Calcium alginate swabs are inhibitory for PCR testing. Regan-Lowe Medium refrigerated after inoculation</td>
</tr>
</tbody>
</table>
Immunology

Quantiferon-TB Gold In-Tube

Specimen Collection - Acceptable Specimen and Handling

Blood Collection In-Tubes containing a set of three (a grey, purple, & red top) 1 ml of blood. Immediately after filling, shake all In-Tubes vigorously for 5 seconds (10X). Ensure the entire inner surface of each tube has been coated with blood. Proper shaking will result in frothing of blood.

Blood volume in each of the three In-Tubes should be between 0.8 and 1.2 ml.

Specimen Storage and Transport

- Specimen must be kept at room temperature.
- Specimen must be received to the Laboratory within 16 hours of blood collection.

Quantiferon-TB Gold In-Tube

Specimen Collection - Acceptable Specimen and Handling

Unacceptable Specimen

- Blood collection tube that is not the three In-Tube set.
- Lithium heparin tubes with serum separator gel.
- Specimens that have been refrigerated.
- Specimens that have not been received in the laboratory within 16 hours of time taken.
- Volume of less than 0.8 or more than 1.2 mls.
- Incomplete labeling/documentation

References:


7. Detection of Influenza A/B Assay Using The Roche LightCycler Instrument DHS-VRDL 2005


10. LightCycler RNA Amp Kit. Roche 2005


APPENDIX A. - Universal Test Request Form & Swine influenza form

*Form HCS-362*

Swine flu lab form 6/2/2009
APPENDIX B - BIOTERRORISM AGENTS

The following information is an excerpt from the Sentinel Laboratory Guidelines for Suspected Agents of Bioterrorism and Emerging Infectious Diseases published by the American Society for Microbiology on their web site at www.asm.org/Policy/index.asp?bid=6342

Clinics and laboratories can access updated guidelines at the above web site for the following potential bioterrorism agents:

*Bacillus anthracis* - Anthrax

Botulinum Toxin

*Brucella* species

*Burkholderia mallei* - Glanders

*Burkholderia pseudomallei* - Melioidosis

*Coxiella burnetii* - Q Fever

Francisella tularensis - Tularemia

Staphylococcal Enterotoxin B

Viruses - see the Guidelines for a list of potential viral bioterrorism agents

*Yersinia pestis* - Plague
Appendix B - Bioterrorism Agents

Contact Information

The Santa Barbara County Public Health Laboratory should be contacted immediately by telephone whenever specimens are to be submitted for detection of any of the above agents. San Luis Obispo County Public Health Laboratory is the designated Laboratory Response Network (LRN) reference laboratory for Santa Barbara County. We will work closely with them to determine if specimens or reference cultures should be submitted to our laboratory or directly to the LA lab.

<table>
<thead>
<tr>
<th>Santa Barbara Public Health Lab</th>
<th>San Luis Obispo Public Health Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Phone: 681-5255</td>
<td>Primary Phone: 805-781-5507</td>
</tr>
<tr>
<td>Debra Palacio Cell Phone: 331-6305</td>
<td>Dr. Beebe Cell # 805-459-9915</td>
</tr>
<tr>
<td>24 Hour SBPHD Duty Officer: 681-5280</td>
<td></td>
</tr>
</tbody>
</table>

Anthrax

Specimen Collection - Acceptable Specimens

Cutaneous Anthrax

(1) Vesicular Stage: Aseptically collect vesicular fluid on sterile swabs from previously unopened vesicles. Note: the anthrax bacilli are most likely to be seen by Gram stain in the vesicular stage.

(2) Eschar stage: Collect eschar material by carefully lifting the eschar's outer edge; insert a sterile swab, then slowly rotate for 2 - 3 seconds beneath the edge of the eschar without removing it.
Appendix B - Bioterrorism Agents

Gastrointestinal anthrax

(1) Blood cultures: Collect appropriate blood volume and number of sets per laboratory protocol. In later stages of disease (2-8 days post-exposure) blood cultures may yield the organism, especially if obtained before antibiotic treatment.

(2) Stool: Transfer $\geq 5$ g of stool directly into a clean, dry, sterile, wide-mouth, leak-proof container.

(3) Rectal swab: For patients unable to pass a specimen, obtain a rectal swab by carefully inserting a swab 1 inch beyond the anal sphincter.

Inhalational anthrax

(1) Blood cultures: Collect appropriate blood volume and number of sets per laboratory protocol.

(2) Sputum: Collect $>1$ ml of a lower respiratory specimen into a sterile container. **Inhalational anthrax usually does not result in sputum formation.**

Specimen Transport and Storage

**Call the Public Health Laboratory immediately for packaging & shipping instructions.**

(1) Swabs: Transport directly to laboratory at room temperature. For transport time $>1$ h, transport at 2-8°C.

(2) Stool: Transport unpreserved stool to laboratory within 1 h. For transport time $>1$h, transport at 2-8°C.

(3) Sputum: Transport in sterile, screw-capped container at room temperature when transport time is $<1$ h. For transport time $>1$ h, transport at 2-8°C.

Unsatisfactory Specimens

(1) Use general laboratory criteria
Appendix B - Bioterrorism Agents

Botulism

Note: The suspicion of botulism is a public health emergency: notify both local public health officials and the state public health laboratory for approval to submit samples for testing. Submit specimens without delay. DO NOT attempt to culture, identify the organism, or attempt to perform toxin analysis.

Specimen Collection - Acceptable Specimens

1) Feces. Place into sterile unbreakable container and label carefully. Confirmatory evidence of botulism may be obtained from 10- to 50-g quantities (walnut size); botulism has been confirmed in infants with only "pea-size" stool samples.

2) Enema. Place approximately 20 ml into a sterile unbreakable container and label carefully. If an enema must be given because of constipation, a minimal amount of fluid (preferably sterile, non bacteriostatic water) should be used to obtain the specimen so that the toxin will not be unnecessarily diluted.

3) Gastric aspirate or vomitus. Place approximately 20 ml into a sterile unbreakable container and label carefully.

4) Serum. Use red top or serum separator tubes to obtain serum (no anticoagulant). Samples should be obtained as soon as possible after the onset of symptoms and before antitoxin is given. Enough blood should be collected to provide at least 10 ml of serum for mouse toxicity tests (usually 20 ml of whole blood); serum volumes less than 3 ml will provide inconclusive results. Whole blood should not be sent, because it typically undergoes excessive hemolysis during transit.

5) Tissue or exudates. Place into sterile unbreakable container and label carefully. Specimens should be placed in anaerobic transport media and sent to the appropriate laboratory for attempted isolation of C.botulinum.

6) Postmortem. Obtain specimens of intestinal contents from different levels of small and large intestines. Place approximately 10 g per specimen into a sterile unbreakable container and label carefully. Obtain gastric content, serum, and tissue specimens if or as appropriate.
Appendix B - Bioterrorism Agents

Botulism

Specimen Transport and Storage

(1) Store all specimens at 4°C and ship on cold packs as soon as possible.

(2) Submit to a LRN Reference laboratory as soon as possible. Call the Public Health Laboratory for instructions and assistance with shipping.

 Unsatisfactory Specimens

(1) Incomplete documentation. All specimens must include the sender's name and telephone number to contact for the preliminary report and additional information. Contact the Public Health Laboratory for the required Chain of Custody forms.

(2) Improper packaging/shipping - Contact the Public Health Laboratory for assistance with packaging and shipping.

(3) Lack of prior approval. Do not ship specimens to the LRN reference laboratory without prior approval. Contact the Public Health Laboratory for liaison with the LRN reference laboratory.
Appendix B - Bioterrorism Agents

Brucellosis

8 SAFETY NOTES FOR LABORATORIES:

1. *Brucella* has been responsible for many laboratory-acquired infections. If *Brucella* is suspected or the Gram stain shows a small, gram-negative coccobacillus, avoid aerosols and perform subcultures in a biosafety cabinet. Plates should be taped shut, and all further testing should be performed only in the biosafety cabinet, using Biosafety level III practices.

2. All patient specimens should be handled while wearing gloves and gowns and working in a biosafety cabinet. Subcultures should be performed in a biosafety cabinet and incubated in 5 to 10% CO2. Plates should be taped shut, and all further testing should be performed only in the biosafety cabinet.

3. Identification of *Brucella* species should not be attempted with commercial identification systems

Specimen Collection - Acceptable Specimens

(1) Blood or bone marrow (Collect directly into a standard blood culture system)

(2) Spleen, liver, joint fluid or abscesses are occasionally sources of *Brucella* ssp.

(3) Serum (at least 1ml)-For serologic diagnosis, an acute-phase specimen should be collected as soon as possible after onset of disease. A convalescent-phase specimen should be collected > 14 days after the acute specimen.
Specimen Transport and Storage

(1) Blood or bone marrow collected in a standard blood culture should be delivered to the laboratory immediately for incubation.

(2) Tissue or synovial fluid specimens should be delivered to the laboratory as soon as possible. These specimens should be refrigerated at 2º to 8º C.

(3) Serum specimens collected for serological testing should be refrigerated until delivered to the laboratory.

Appendix B - Bioterrorism Agents

Brucellosis

Unsatisfactory Specimens

(1) Specimens collected from non-sterile sites.

(2) Tissue or synovial fluid specimens that have not been refrigerated during storage or transport.

Burkholderia mallei and Burkholderia pseudomallei

Specimen Collection - Acceptable Specimens

(1) Blood or bone marrow (Collect in standard blood culture bottles)

(2) Sputum or bronchoscopically obtained specimens

(3) Abscess material and wound swabs

(4) Urine

(5) Serum (1 ml). Both acute- and convalescent-phase (obtained 14 days after the acute-phase specimen) specimens should be collected if serologic diagnosis of B. pseudomallei infection is being considered. Currently, no serology for B. mallei is available in the United States.
Specimen Transport and Storage

(1) *Burkholderia species* are not fastidious organisms, however, specimens taken from non-sterile sources should be refrigerated at 2º to 8º C to prevent overgrowth of contaminating organisms.

Unsatisfactory Specimens

(1) Use standard laboratory criteria.

*Appendix B - Bioterrorism Agents*

*Plague - Yersinia pestis*

Specimen Collection - Acceptable Specimens

Specimens of choice will be determined by the clinical presentation:

(1) Lower respiratory tract (pneumonic): Bronchial wash or transtracheal aspirate (>1 ml). Sputum may be examined but this is not advised because of contamination by normal throat flora.

(2) Blood (septicemic): Collect appropriate blood volume and number of sets per established laboratory protocol in standard blood culture system.

(3) In suspected cases of plague, an additional blood or broth culture (general nutrient broth) should be incubated at room temperature (22º to 28º C), temperature at which *Y. pestis* grows faster. Do not shake or rock the additional broth culture so that the characteristic growth formation of *Y. pestis* can be clearly visualized.

Aspirate of involved tissue (bubonic) or biopsied specimen

(1) Tissue or aspirates that can be obtained for culture include liver, spleen, bone marrow, lymph node, and/or lung. Note: Aspirates may yield little material; therefore, a sterile saline flush may be needed to obtain an adequate amount of specimen.
Specimen Transport and Storage

(1) Respiratory/sputum: Transport specimens in sterile, screw-capped containers at room temperature. If it is known that material will be transported from 2–24 h after collection, then store container and transport at 2º to 8º C.

(2) Blood: Transport samples directly to the laboratory at ambient temperature. Hold them at ambient temperature until they are placed onto the blood culture instrument or incubator. **Do not refrigerate.**

(3) Tissue aspirate/biopsy specimen: Submit tissue or aspirate in a sterile container. For small samples, add 1–2 drops of sterile normal saline to keep the tissue moist. Transport the sample at room temperature for immediate processing. Refrigerate at 2º to 8º C if specimen processing will be delayed more than 2 hours.

**Plague - Yersinia pestis**

Specimen Transport and Storage

(4) Swabs: A swab of tissue is not recommended. However, if a swab specimen is taken, the swab should be reinserted into the transport package for transport. **(Do not submit dry swabs without transport media)**

Unsatisfactory Specimens

(1) Aspirated specimens submitted in a syringe or syringe with needle attached. Aspirated specimens must be transferred to a sterile, screw capped container before being transported to the laboratory.

(2) Dried swabs. Tissue swabs must be submitted in a transport medium.

(3) Blood culture bottles that have been refrigerated.


**Tularemia - Franciscella tularensis**

**Specimen Collection - Acceptable Specimens**

(1) Blood culture: Collect appropriate blood volume and number of sets per established laboratory protocol.

(2) Biopsied tissue or scraping of an ulcer is preferable; a swab of the ulcer is an acceptable alternative.

(3) Aspirate of involved tissue.

**Specimen Transport and Storage**

(1) Blood: Transport directly to laboratory at room temperature. Hold at room temperature until placed onto the blood culture instrument or incubator. **Do not refrigerate.** Follow established laboratory protocol for processing blood cultures.

(2) Biopsy: Submit tissue, scraping or aspirate in a sterile container. For small tissue samples, add several drops of sterile normal saline to keep the tissue moist. Transport at room temperature for immediate processing. If processing of specimen is delayed more than 2 hours, keep specimen refrigerated at 2º to 8º C.

**Tularemia - Franciscella tularensis**

**Specimen Transport and Storage**

(3) Swabs: Obtain a firm sample of the advancing margin of the lesion. If using a swab transport carrier, the swab should be reinserted into the transport package and the swab fabric moistened with the transport medium inside the packet. Store and transport at 2º to 8º C if processing will be delayed more than 2 hours.

**Unsatisfactory Specimens**

(1) Aspirated specimens submitted in a syringe or syringe with needle attached. Aspirated specimens must be transferred to a sterile, screw capped container before being transported to the laboratory.
(2) Dried swabs. Tissue swabs must be submitted in a transport medium.

(3) Blood culture bottles that have been refrigerated.

Staphylococcal Enterotoxin B

Specimen Collection - Acceptable Specimens

(1) Serum: Serum is the preferred specimen for testing for inhalation SEB intoxication by detecting antibodies to SEB. Use a red-top or serum separator-type (SST) tube to obtain serum. The tube must be free of anticoagulants. Samples should be obtained as soon as possible after the onset of symptoms to detect the toxin. Approximately 10 ml of blood should be drawn to provide 5 ml of serum. Serum should also be collected 7 to 14 days after onset of illness to compare acute- and convalescent-phase antibody titers. Do not send whole blood, since hemolysis during transit will compromise the quality of the specimen. Label completely.

(2) Culture isolate: If an isolate of *S. aureus* is recovered from a specimen, it may be sent for toxin testing on an appropriate agar slant that supports its growth or a transport swab. Label completely.

(3) Nasal swab: Collect a nasal swab within 24 hours of exposure by rubbing a dry, sterile swab (Dacron or rayon) on the mucosa of the anterior nares. Place in protective transport tube and label completely.

(4) Induced respiratory secretions. Sputum induced by instilling 10 to 25 ml of sterile saline into the nasal passages should be collected into a sterile screw-top container. Seal tightly and label completely.

Staphylococcal Enterotoxin B

Specimen Collection - Acceptable Specimens

(5) Urine: A 20 to 30-ml urine sample should be collected from the patient into a sterile screw-top container as soon as possible. Seal the container tightly and label completely.

(6) Stool/gastric aspirate: A 10- to 50-g sample of stool should be placed in a sterile leakproof container with a screw-top lid. Close securely and label completely.

(7) Postmortem: Obtain specimens of the intestinal contents from different levels of the small and large bowel. Place 10 g of specimen into a sterile unbreakable container and label completely. Obtain serum as previously described.
Specimen Transport and Storage

(1) In conjunction with instructions from the Public Health Laboratory, arrange for immediate shipment at 2º to 8º C to the LRN Reference laboratory.

(2) Follow infectious substance regulations for packing and shipping. [Refer to ASM Guideline on Packing and Shipping Infectious Substances, Diagnostic Specimens, and Biological Agents http://www.asm.org/index.asp?bid=6342. Call the Public Health Laboratory for assistance with packaging and shipping.

Unsatisfactory Specimens

(1) Incomplete documentation. All specimens must include the sender’s name and a telephone number to contact for the preliminary report and additional information.

(2) Improper packaging/shipping. Contact the Public Health Laboratory for assistance with packaging and shipping.
Appendix C: Viral and Rickettsial Diseases Laboratory Services

Guide to the Services of the Viral and Rickettsial Diseases Laboratory

California State Department of Health Services

DIAGNOSTIC TESTS ROUTINELY AVAILABLE FROM THE STATE VIRAL AND RICKETTSIAL DISEASES LABORATORY

Other tests may be available in special circumstances. Please contact the Santa Barbara Public Health Laboratory (805)681-5255 for further information. In most instances, acute and convalescent sera are needed for diagnosis. History of travel or other potential exposure is desirable particularly for those diseases non-endemic in California. Please note that testing at the VRDL is performed without charge and is generally restricted to outbreaks of disease under epidemiological investigation by the health department, new or emerging diseases and diseases that are not endemic to California.
# Viral and Rickettsial Diseases Laboratory Services

<table>
<thead>
<tr>
<th>Disease or Syndrome</th>
<th>Etiologic Agents</th>
<th>Serologic Tests for Antibody</th>
<th>Specimens for Isolation or Direct Detection</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Congenital-Neonatal Infections</strong></td>
<td>Chlamydia trachomatis</td>
<td>IF</td>
<td>Conjunctival-EIA,NA</td>
<td>Also trachial aspirate</td>
</tr>
<tr>
<td></td>
<td>Cytomegalovirus</td>
<td>EIA (ACIF, CF)</td>
<td>N/P, Throat swb, urine</td>
<td>Also autopsy</td>
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<tr>
<td></td>
<td>Herpes simplex virus 1 &amp; 2</td>
<td>EIA (IF, CF)</td>
<td>N/P, Throat swb, CSF, skin, urine</td>
<td>Also autopsy</td>
</tr>
<tr>
<td></td>
<td>HIV</td>
<td>EIA, IF, WB</td>
<td>Blood</td>
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</tr>
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<td></td>
<td>Human herpes virus 6</td>
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<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Varicella-zoster</td>
<td>EIA (IF)</td>
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<td></td>
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<tr>
<td></td>
<td>Parvovirus B19</td>
<td>EIA</td>
<td>Blood-PCR</td>
<td>Epidemiological studies</td>
</tr>
<tr>
<td></td>
<td>Rubella virus</td>
<td>EIA (IF)</td>
<td>N/P, Throat swb, conjunctival, urine</td>
<td>Also autopsy</td>
</tr>
<tr>
<td><strong>Eye Infections</strong></td>
<td>Herpes simplex virus</td>
<td>EIA, (IF CF)</td>
<td>Conjunctival swb</td>
<td>Also corneal scraping</td>
</tr>
<tr>
<td></td>
<td>Chlamydia trachomatis</td>
<td>IF</td>
<td>Conjunctival swb-EIA</td>
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<tr>
<td></td>
<td>Adenovirus</td>
<td>EIA</td>
<td>N/P, Throat swb, conjunctival swb, DIF</td>
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<td>Enterovirus 70</td>
<td>(NT)</td>
<td>Conjunctival swb</td>
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<td>Coxsackievirus A24</td>
<td>(NT)</td>
<td>Conjunctival swb</td>
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<td>Rotavirus</td>
<td>No routine test</td>
<td>Stool-EM</td>
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<td>Norwalk virus</td>
<td>(IEM)</td>
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<td>Astrovirus</td>
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<td></td>
<td>Adenovirus 40, 41</td>
<td>(IEM)</td>
<td>Stool-IEM</td>
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<tr>
<td><strong>Hepatitis</strong></td>
<td>Hepatitis A virus (HAV)</td>
<td>EIA-IgM</td>
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<td>EIA-IgG</td>
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<td>Hepatitis B virus (HBV)</td>
<td>EIA-HBs, HBe, Hbc, HbcIgM, HbcIgG</td>
<td>Blood/Plasma-EM, EIA-HBs &amp; Hbc</td>
<td>ALL HEPATITIS TESTS PERFORMED FOR REFERENCE OR EPIDEMIOLOGICAL INVESTIGATION ONLY</td>
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<tr>
<td></td>
<td>Hepatitis D</td>
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<td>Hepatitis E</td>
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<td><strong>Nervous System Disease</strong></td>
<td>Enterovirus</td>
<td>EIA-IgM, (NT)</td>
<td>Stool, N/P, Throat swb, CSF, Blood, plasma, autopsy</td>
<td>Autopsy for isolation, Give exposure history</td>
</tr>
<tr>
<td></td>
<td>LCM virus</td>
<td>IF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SLE virus</td>
<td>EIA, IF (CF)</td>
<td>Autopsy</td>
<td>Give exposure history</td>
</tr>
<tr>
<td></td>
<td>WEE virus</td>
<td>EIA, IF (CF)</td>
<td>Autopsy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CEV group</td>
<td>IF (CF)</td>
<td>Autopsy</td>
<td>Give travel history</td>
</tr>
<tr>
<td></td>
<td>Herpes simplex virus</td>
<td>EIA, PCR (IF, CF)</td>
<td>N/P, Throat swb, CSF, Biopsy, Autopsy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rabies virus</td>
<td>(IF, FFIT)</td>
<td>Biopsy, Autopsy</td>
<td>Call health dept.</td>
</tr>
<tr>
<td></td>
<td>Poliomyelitis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Herpes B virus Simian</td>
<td>IF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HIV</td>
<td>EIA, IF (WB)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D - MDL State Laboratory Services.

Guide to the Services of the Microbial Diseases Laboratory

California State Department of Health Services

Note: Contact the Santa Barbara at 681-5255 to determine the availability of these services and to obtain necessary forms or other information.

NOTE: The Microbial Diseases Laboratory is not our reference laboratory for Bioterrorism related testing. See Appendix B for Instructions.
## Guide to Serologic Services - Microbial Diseases Laboratory

<table>
<thead>
<tr>
<th>Disease</th>
<th>Test</th>
<th>Source</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amebiasis</td>
<td>IHA</td>
<td>MDL</td>
<td>Sensitivity highest for extra-intestinal amebiasis.</td>
</tr>
<tr>
<td>Amebic meningoencephalitis</td>
<td>IFA</td>
<td>CDC</td>
<td>Experimental Test (CSF and Serum)</td>
</tr>
<tr>
<td>Acanthamoeba, Naegleria</td>
<td>IFA</td>
<td>CDC</td>
<td>Limited value - Lacks sensitivity and specificity</td>
</tr>
<tr>
<td>Angiostrongylus</td>
<td>ELISA</td>
<td>CDC</td>
<td>Cross reactions may occur with malaria</td>
</tr>
<tr>
<td>Babesiosis</td>
<td>TA, CF</td>
<td>MDL, CDC</td>
<td>Test lacks sensitivity &amp; specificity. Frequent cross-reactions</td>
</tr>
<tr>
<td>Brucellosis</td>
<td>TA, CF</td>
<td>MDL</td>
<td>Cross-reactions due to <em>Vibrio cholerae</em> infection or immunization</td>
</tr>
<tr>
<td>Candidiasis</td>
<td>ID LA ELISA</td>
<td>CDC</td>
<td>ELISA test is experimental</td>
</tr>
<tr>
<td>Chagas Disease</td>
<td>CF, IFA</td>
<td>CDC</td>
<td>Cross reactions with leishmaniasis and other parasitic infections</td>
</tr>
<tr>
<td>Cholera</td>
<td>VC</td>
<td>CDC</td>
<td>CF Test relatively specific. Cross-reactions rare</td>
</tr>
<tr>
<td>Coccidioidomycosis</td>
<td>CF, ID</td>
<td>MDL, CDC</td>
<td>Sensitivity higher for serum than for CSF</td>
</tr>
<tr>
<td>Cysticercosis</td>
<td>Blot</td>
<td>CDC</td>
<td>Hydatid cysts in the lung less frequently detected than in the liver</td>
</tr>
<tr>
<td>Echinococcosis</td>
<td>IHA, Blot</td>
<td>CDC</td>
<td>Frequent cross-reactions with Chagas’s disease</td>
</tr>
<tr>
<td>Farmer’s Lung (Hypersensitivity Pneumonitis)</td>
<td>ID, CDC</td>
<td>CDC</td>
<td>Antigens include <em>Micropolyspora faeni, Thermoactinomyces candidus, T. vulgaris</em></td>
</tr>
<tr>
<td>Histoplasmosis</td>
<td>CF, ID</td>
<td>MDL, CDC</td>
<td>Caution: a single skin test may make serologic tests uninterpretable</td>
</tr>
<tr>
<td>Legionnaires’ Disease</td>
<td>MDL</td>
<td>MDL</td>
<td>Antibody may appear late in infection - up to 6 weeks after onset</td>
</tr>
<tr>
<td>Leishmaniasis</td>
<td>IFA, CF</td>
<td>CDC</td>
<td>Frequent cross-reactions with Chagas’s disease</td>
</tr>
<tr>
<td>Leptospirosis</td>
<td>IHA, MA</td>
<td>MDL, CDC</td>
<td>Paired sera usually required</td>
</tr>
<tr>
<td>Lyme Disease</td>
<td>ELISA</td>
<td>MDL</td>
<td>Minimum of 2ml serum or 1ml CSF required</td>
</tr>
<tr>
<td>Malaria</td>
<td>IFA</td>
<td>CDC</td>
<td>Testing restricted to patients with febrile illness but having repeatedly negative blood smears, transfusion induced malaria cases</td>
</tr>
<tr>
<td>Nocardiosis</td>
<td>ID</td>
<td>CDC</td>
<td>Experimental Test</td>
</tr>
<tr>
<td>Paracoccidioidomycosis</td>
<td>CF, ID</td>
<td>CDC</td>
<td>Cross-reactions may occur with other fungal infections</td>
</tr>
<tr>
<td>Paragonimiasis</td>
<td>Blot</td>
<td>CDC</td>
<td>Sensitivity 96% Specificity 99%</td>
</tr>
<tr>
<td>Pertussis</td>
<td>MTA</td>
<td>MDL</td>
<td>Paired sera usually required</td>
</tr>
<tr>
<td>Plague</td>
<td>IHA</td>
<td>CDC</td>
<td>Serologic response may be delayed in severe cases</td>
</tr>
<tr>
<td>Salmonellosis (Typhoid Fever)</td>
<td>TA, IHA(Vi)</td>
<td>MDL, CDC</td>
<td>The IHA test with purified Vi antigen may help detect typhoid carriers</td>
</tr>
<tr>
<td>Schistosomiasis</td>
<td>Blot</td>
<td>CDC</td>
<td>Immunoblot is species specific</td>
</tr>
<tr>
<td>Sporotrichosis</td>
<td>LA, TA</td>
<td>CDC</td>
<td>Helpful in detecting extracutaneous or systemic sporotrichosis</td>
</tr>
</tbody>
</table>
# Guide to Serologic Services - Microbial Diseases Laboratory

<table>
<thead>
<tr>
<th>Disease</th>
<th>Test¹</th>
<th>Source²</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongyloidiasis</td>
<td>ELISA</td>
<td>CDC</td>
<td>Sensitivity 88% Specificity 80%</td>
</tr>
<tr>
<td>Syphilis</td>
<td>RPR,</td>
<td>Local Public Health Lab</td>
<td>Contact local public health laboratory for information</td>
</tr>
<tr>
<td></td>
<td>VDRL(CSF), FTA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trichinosis</td>
<td>LA, BF</td>
<td>MDL, CDC</td>
<td>LA test is a qualitative screening test. Positive sera sent to CDC</td>
</tr>
<tr>
<td>Tularemia</td>
<td>TA</td>
<td>MDL</td>
<td>Cross-reactions with Brucella infections</td>
</tr>
<tr>
<td>Visceral Larva Migrans</td>
<td>ELISA</td>
<td>CDC</td>
<td>A titer of 1:32 is indicative of infection at some time</td>
</tr>
<tr>
<td>(Toxocariasis)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visceral Larva Migrans (Phycomycosis)</td>
<td>ELISA</td>
<td>CDC</td>
<td>Experimental Test</td>
</tr>
</tbody>
</table>

Blot = Immunoblot  
BF = Bentonite Flocculation Test  
CF = Complement Fixation Test  
ELISA = Enzyme-Linked Immunosorbent Assay  
ID = Immunodiffusion Test  
IFA = Indirect Fluorescent  
IHA = Indirect Hemagglutination Test  
LA = Latex Agglutination Test  
MA = Microscopic Agglutination Test  
MTA = Microtiter Agglutination Test  
TA = Tube Agglutination Test  
VC = Vibriocidal Antibody Test

CDC = Centers for Disease Control  
MDL = Microbial Diseases Laboratory

Reference Services in Microbiology - Microbial Diseases Laboratory
Note: Isolation, identification, serologic characterization and toxin testing, of a number of microorganisms are available through the Microbial Diseases Laboratory. These services are accessed through the local Public Health Laboratory. Call (805) 681-5255.