

LABORATORY COLLECTION MANUAL	LOWER RESPIRATORY TRACT SPECIMEN COLLECTION
Effective Date: 6/96	Page 1 of 4

I. GENERAL PRINCIPLE

Infections of the lower respiratory tract are a major cause of morbidity and mortality. Unless great care is taken in the collection of specimens, diagnosis of these infections is frequently complicated by contamination from the upper respiratory tract, which may be colonized with potential pathogens not involved in the infection of the lower tract. The result is treatment for an organism that is not the causative agent.

II. SPECIMEN COLLECTION

A. General instructions

1. Great care should be taken to avoid contaminating specimens with the normal flora of the upper respiratory tract. Refrain from submitting postnasal discharge as sputum specimen.
2. If *Legionella*, *Chlamydia* or *Mycoplasma* spp. are suspected, the laboratory must be contacted prior to collection. Special techniques and/or media are required for the isolation of these agents.
 - a. *Legionella* sp.
 - 1) Non-tissue specimens of less than 0.5 ml will be processed for culture only. Direct detection tests can be performed, in addition to the culture, on volumes of greater than 0.5 ml.
 - 2) Any visible amount of tissue is acceptable. Place in sterile container and add a small amount of sterile, nonbacteriostatic, distilled water to prevent drying if transport to the lab is delayed. **Do not use saline**, as it may be inhibitory.
 - b. *Chlamydia* sp.
 - 1) **Do not** use a calcium alginate or wooden shaft swab for specimen collection. Use Dacron, rayon, or cotton tipped swabs on a plastic or metal shaft.
 - 2) Place swab in a **chlamydia/viral/mycoplasma transport media** tube and snap off shaft.
 - c. *Mycoplasma* sp.
 - 1) Obtain specimen with sterile dacron swab and place in a **chlamydia/viral/mycoplasma transport media** tube. Mix vigorously.
 - 2) **Place date and time on tube. Specimen must reach reference lab within 72 hours of that time.**

B. Sputum

1. **Expectorated and induced sputum specimens for routine culture will be examined microscopically by lab staff for acceptability before cultures will be performed.**
2. The minimum standard of care for a routine sputum culture order requires a microscopic screen for acceptability, gram stain, and culture. If testing is requested on an outpatient, it is preferred that the patient wait until the specimen is examined for acceptability before leaving.

LABORATORY COLLECTION MANUAL	LOWER RESPIRATORY TRACT SPECIMEN COLLECTION
Effective Date: 6/96	Page 2 of 4

3. Sputum screen

- a. Laboratory staff will perform a microscopic exam of expectorated or induced sputum to determine absence of epithelial cells and presence of white blood cells (WBC). Sputum submitted as an aspirate or transtracheal specimen is assumed to be uncontaminated with normal oral respiratory flora and a screening procedure is not necessary.

An acceptable sputum is one that contains:

- * less than 10 epithelial cells / low power field.
- * more than 25 WBC / low power field.

- b. Lab staff will call unacceptable results to the unit or person responsible for collection. This will be documented in the computer, as to who was informed and that another specimen must be submitted. Lab staff is also responsible for cancellation of sputum culture and gram stain, as an unacceptable specimen. If the specimen is unacceptable, recollect and resubmit with new order.

4. Expectorated sputum

- a. Instruct the patient in the use of the sputum collection container. Request patient to not expectorate saliva or postnasal discharge into the container. A first morning specimen is the one of choice, as it contains the highest concentration of organisms.
- b. Have patient rinse mouth and gargle with an astringent mouthwash, or failing that, water.
- c. Ask patient to cough deeply and **immediately** expectorate specimen into a sterile, screw-cap container. Do not let patient hold specimen in mouth.
- d. Disassemble collection container, place cap on conical centrifuge tube and tighten, label, and transport to the laboratory. Discard remaining pieces of the collection device at the patient's bedside. **DO NOT transport the specimen container with the collection device attached.**

5. Induced sputum

- a. Brush buccal mucosa, tongue and gums with a wet tooth brush prior to procedure. Rinse patient's mouth thoroughly with water.
- b. Request respiratory therapy to administer breathing treatment.
- c. Collect induced sputum in the sterile screw-cap container as outlined above.

C. Tracheostomy and endotracheal aspiration

1. Tracheostomy is followed by colonization within 24 hours of tube insertion. Results of culture should be correlated with clinical findings, such as a fever or chest x-ray infiltrate.
2. Aspirate specimen into a sterile sputum trap.

LABORATORY COLLECTION MANUAL	LOWER RESPIRATORY TRACT SPECIMEN COLLECTION
Effective Date: 6/96	Page 3 of 4

D. Bronchial washings

1. Wash or lavage specimens should be obtained before brushing or biopsy specimens to avoid excess blood in the recovered fluid.
2. In a surgical procedure, the physician inserts a bronchoscope in patient's airway, injects sterile, nonbacteriostatic 0.85% NaCl through a channel, and retrieves it by suction into a trap.
3. Aliquots from the same site should be combined for cultures and smears, but aliquots from separate sites should not be combined until after consultation with the physician.

E. Lung aspirate

1. With the aid of the radiology department, a lung aspirate is obtained by insertion of a needle through the chest wall into the pulmonary infiltrate.
2. Dependent on volume, submit specimen in sterile container or in the syringe.

F. Lung Biopsy

1. A 1-cm to 3-cm square of tissue is the surgical specimen of choice.
2. Submit in a sterile container **without formalin**.

III. TRANSPORT

- A. Specimens for *Legionella* testing should be transported in sterile dry containers. Refrigerate specimens that can not be processed within 30 minutes. If processing is delayed more than 24 hours, the specimen would have to be kept at frozen temperatures that this lab does not provide. This means that these specimens must be collected only when they can reach the BRMC lab by 15:00, Monday - Friday, excluding holidays.
- B. The viral/chlamydia/mycoplasma transport media tube should be refrigerated at 4°C immediately after inoculation. If transport to lab is delayed, freeze specimen. Transport to the lab on dry ice if specimen was stored frozen, or on cool packs if it was refrigerated.
- C. Specimens for *Mycoplasma pneumoniae* may be transported to the lab at room temperature or at 4°C. **DO NOT FREEZE.**
- D. Do not refrigerate respiratory specimens for routine culture. Transport at room temperature.
- E. As always, transport specimens to lab in a biohazard bag.

LABORATORY COLLECTION MANUAL	LOWER RESPIRATORY TRACT SPECIMEN COLLECTION
Effective Date: 6/96	Page 4 of 4

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See original policy in the Laboratory for all documented annual reviews.

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