TUBERCULOSIS PROGRAM

Guidelines for Sputum Collection in the Field

Laboratory evaluation of sputum in pulmonary tuberculosis (TB) cases and suspects is an essential tool in the care and clinical management of patients. Results from sputum testing can:

* Provide initial diagnosis
* Provide drug susceptibility testing
* Allow for monitoring of the patient for response to treatment

Additionally, the statewide TB surveillance activity necessitates the documentation of sputum culture results for all pulmonary and pleural TB cases reported in New Jersey. Statewide TB surveillance also seeks to document the date of conversion to sputum culture negative for all patients with positive sputum culture results.

In order to achieve optimum laboratory results, care must be taken in the scheduling, handling, and collection of appropriate specimens for evaluation. Two types of collection procedures will be discussed in this document; Spontaneous samples and induced samples.

FREQUENCY OF FOLLOW-UP SPUTUM COLLECTION FOR PULMONARY TB PATIENTS

For patients with AFB positive sputum smears, follow-up collections should be made every week until the patient has three consecutive negative acid fast bacilli smears or until culture conversion.

Patients whose sputum specimens are initially smear negative or whose sputum smears convert to negative during treatment should have monthly specimen collection until cultures have converted to negative is documented. No further sputum collection is necessary beyond the point of culture conversion unless there is a clinical indication (*e.g.,* recurrence or persistence of TB-like symptoms or treatment interruption) to resume collections. Individuals with MDRTB or HIV-TB may require additional sputum testing to monitor their clinical course.

Note:

When documenting the date of smear conversion and/or culture conversion, **the correct date to use is the date of specimen collection.**

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| RECOMMENDATIONS FOR SPUTUM COLLECTION |
| Purpose | Frequency | Number of specimens |
| Initial Monitoring for smear conversion | Every week after week 2 of therapy | One sample – Collection observed by health care worker |
| Monitoring for imminent smear conversion | Every few days to weekly | Three samples collected at 8-hour intervals – At least one should be an early morning sample. – At least one should be observed by a health care worker – Once first negative smear is observed during periodic monitoring for conversion, collect two additional samples  |
| Monitoring for culture conversion | Monthly | One sample – Collection observed by health care worker |
| Monitoring after culture conversion | Only if clinically indicated | Three samples collected at 8-hour intervals – At least one should be an early morning sample. – At least one should be observed by a health care worker |

**Spontaneous Sputum Collection Procedure**

**Supplies Needed:**

1. Sputum collection kit and patient ID label. Be sure to have appropriate Biohazard containers and labels available for specimens transported via courier or private car. Follow established procedures for mailing clinical specimens.
2. Laboratory requisition form and specimen label.
3. Appropriate respirator for staff.
4. Antiseptic wipes.
5. Disposable gloves.
6. Disposal bags for biohazardous waste.
7. Paper tissues and bag for disposal of tissues.

**Procedure:**

1. Explain the purpose of the procedure to the patient/family. Explain how to collect and handle the specimen following collection.
2. Early morning or upon arising from sleep is generally the best time to collect an adequate specimen.
3. The patient should be instructed to rinse his/her mouth out with water. Antiseptic mouthwash should not be used prior to specimen collection.
4. The patient should be instructed to breathe deeply several times, and then cough to bring up a sample of sputum. The patient should be instructed that the desired sample secretion is from deep within the lungs, not the nose, throat, or saliva.
5. If the patient is unable to produce, steam from a hot shower or boiling kettle may assist in stimulating coughing and loosening secretions.
6. The expectorated specimen should be deposited directly into the sample container. A good sputum sample is thick, purulent and sufficient in amount (2-3 ml).
7. The lid should be tightly closed. The outside of the container may be cleansed with antiseptic wipes or a 1:10 bleach-water solution or other tuberculocidal disinfectant after the container is tightly closed.
8. Specimens should be refrigerated following collection until transported. If specimens were not refrigerated, they should still be sent to the lab for processing.
9. Arrange for collection of samples from patient for transport to lab. For specimens that are to be mailed, follow agency procedures for preparing samples in appropriate, approved packaging for mailing.
10. If the specimen is to be transported via courier or car, the specimen tube should be nested in the two additional mailer tubes. The cap to each container should be tightened to prevent leakage. The final container should be sealed.
11. Refer to chart for collection frequency and number of specimens required. For each collection sequence, at least one sample in the series should be observed by a health care provider.

# Induced Sputum Collection Procedure

Sputum induction is a procedure used to collect a sputum specimen from a patient that is having difficulty producing a spontaneous sample. The patient will breathe a mist of saline droplets into the lungs to stimulate coughing and the production of respiratory secretions.

**Supplies Needed**

1. Nebulizer with disposable tubing

1. Saline solution for nebulizer
2. Sputum collection kit and patient ID label. Be sure to have appropriate Biohazard containers and labels available for specimens transported via courier or private car. Follow established procedures for mailing clinical specimens.
3. Laboratory requisition form and specimen label.
4. Appropriate respirator for staff.
5. Disposable gloves
6. Antiseptic wipes
7. Disposal bags for biohazardous waste
8. Paper tissues and bag for disposal of tissues

**Procedure:**

1. Explain the purpose of the procedure to the patient/family.
2. Explain the procedure for collection to the patient/family. Advise the patient that the procedure will help him/her cough.
3. Assemble the nebulizer with tubing and saline. Orient the patient to the equipment and demonstrate how the equipment works. Reassure the patient that the unit is clean and the tubing new.
4. Provide the patient with the specimen collection vile. Advise the patient to keep the collection vile closed until ready to use, and to close the vessel tightly once the specimen is collected.
5. The patient should be instructed to rinse his/her mouth out with water. Antiseptic mouthwash should not be used prior to specimen collection.
6. The patient should be instructed to deeply inhale the aerosolized saline for up to five minutes, and then cough vigorously. The patient should be instructed that the desired sample secretion is from deep within the lungs, not the nose, throat, or saliva.
7. Carefully observe the nebulizer during patient inspiration. Upon activating the nebulizer, and prior to the patient inhaling, a visible mist should be seen inside the air flow chamber and escaping from the mouthpiece. This mist will no longer be visible when the patient is inhaling correctly (i.e., with deep inspiration).
8. If sputum collection was not successful with the first cycle of nebulization, the patient should be instructed to repeat the inhalation procedure, as needed. This sequence may be repeated three to five times before the attempt is abandoned as unsuccessful. It may be necessary to take a short break between cycles if the patient tires.
9. The induced specimen should be deposited directly into the sample container. A good sputum sample is thick, purulent and sufficient in amount (2-3 ml).
10. The lid should be tightly closed.
11. Specimens should be refrigerated following collection until transported. If specimens were not refrigerated, they should still be sent to the lab for processing.
12. The laboratory requisition form should indicate *Induced Sputum* as the specimen type.
13. If the specimen is to be transported via courier or car, the specimen tube should be nested in the two additional mailer tubes. The cap to each container should be tightened to prevent leakage. The final container should be sealed.
14. If the specimen is to be mailed, follow agency procedures for preparing samples in appropriate, approved packaging for mailing.

**Storage and transportation of specimens**

If the specimen is collected in the field and cannot be immediately processed, it should be transported to the laboratory within 3-4 days of collection. The specimen should be collected in the containers meant for the purpose, lid tightly secured, properly labeled and kept away from the sun and heat. These can be placed in a special box which can withstand leakage of contents, shocks and other conditions incident to ordinary handling practices. These boxes should be kept in cooler conditions and then transported to the laboratory.

**Infection Control:**

1. Staff performing this procedure should have a documented record of tuberculin skin test (or interferon gamma release immunoassay) baseline status.
2. Staff should wear an approved respirator (N95 or equivalent) while assisting the patient with this procedure.
3. Sputum collection should be take place outdoors when feasible.
4. Indoor collection of spontaneous or induced sputum should only be conducted in a single room with the door closed and air exhausted to the outside of the building without recirculation.
5. Family (or any third party personnel) should not be allowed in the room during the actual induction procedure.
6. Following the procedure, the patient should remain isolated until all coughing has subsided.
7. The room should be well ventilated following the procedure, or closed for use until adequate time for clearance has passed. (Open windows, use exhaust fans, etc.)
8. Discard all tubing with cup in approved biohazard container.
9. Wipe down the nebulizer with 1:10 bleach-water solution.
10. Replace nebulizer filters as needed.