

# SPUTUM COLLECTION: NEBULIZED INDUCTION



## Indications for sputum collection:

1. To establish the initial diagnosis of pulmonary of tuberculosis.
2. To determine and monitor infectiousness of the patient and release from airborne infection isolation.
3. To provide “proof of cure” or efficacy of treatment by culture for mycobacteria.
4. To re-evaluate potential infectiousness and/or treatment failure when treatment has been interrupted or inadequate.

Nebulized induction can be used to collect sputum from a patient who has a dry, non-productive cough.



## Sputum Quality

- A good sputum specimen consists of recently discharged material from the bronchial tree, with minimum amounts of oral or nasal material.
- Satisfactory specimens are thick and contain mucoid or mucopurulent material.
- Ideally, a sputum specimen should have a volume of 3-5 ml, although smaller quantities are acceptable if the quality is satisfactory.
- Poor quality sputum specimens are thin and watery and not suitable for testing. Saliva and nasal secretions are unacceptable.



## Materials and Equipment

- Sterile, filtered water or normal saline (150-200 ml)
- Hand-held nebulizer with mouthpiece and 15 ml vial of 3% saline
  - A mask may be used if a patient absolutely cannot use the mouthpiece
  - 3% saline may be available from the pharmacy if not available in department stock
- N95 mask (particulate respirator)
- Gloves
- Box of tissues
- Sterile specimen container approved by the laboratory for sputum collection and transport

## Procedure

### A. Preparation

1. Assure that the patient is NPO (has no food or drink) for three hours prior to sputum induction.

**Note:** Three hours NPO reduces the potential risk of vomiting and aspiration.

2. Instruct the patient to gently brush their teeth, gingival margins, tongue, and buccal surfaces using sterile, filtered water or normal saline to rinse. **DO NOT** use tap water, unfiltered water or saline, toothpaste, commercial mouth wash preparations, nose drops, or any medications containing alcohol or oil. Instruct the patient to avoid taking oral antibiotics or any other medications immediately before the sputum collection procedure.
3. Instruct the patient to gargle several times with sterile, filtered water or normal saline after brushing. **DO NOT** use tap water or water from any unfiltered source as it may contain non-tuberculous mycobacteria that may alter test results.
4. For specimen collection, ensure that the patient is outdoors or placed in an airborne isolation room or negative-pressure sputum collection booth with the door shut. The air in the negative pressure room or booth should be drawn out of the space and ventilated outside of the building.



## B. Sputum Collection

1. Observe airborne precautions at all times.

**Note:** N95 masks must be worn by health care personnel for AFB cough-producing procedures.

2. The patient must be outdoors or in an appropriate negative air pressure room or booth.
3. Place approximately 5 ml of 3% saline into the hand-held nebulizer. Set the flow at 6-8 L/min and nebulize saline for 7–10 minutes or until sputum is expectorated. The maximum nebulization time is 20 minutes.

**Note:** More saline may be added to the nebulizer if more than 10 minutes is needed to produce an adequate cough.

4. Ask the patient to inhale the nebulized 3% saline deeply 2–3 times followed by vigorous cough. This will assist in expectorating quality sputum. Collect the sputum into a sterile specimen container.

**Note:** Coaching the patient is very important in order to get quality results in a timely manner.

**Note:** High-quality sputum is required for laboratory testing. Ideally, a sputum specimen should have a volume of 3-5 ml, although smaller quantities are acceptable if the quality is satisfactory.

5. Print the patient's name, date of birth, specimen type, and date/time of collection on the specimen container. Health care personnel collecting the specimen may want to include their initials.



## Resources

1. Curry International Tuberculosis Center, 2011. Tuberculosis Infection Control: A Practical Manual for Preventing TB, pp. 83-97. [http://www.currytbcenter.ucsf.edu/sites/default/files/ic\\_book\\_2011.pdf](http://www.currytbcenter.ucsf.edu/sites/default/files/ic_book_2011.pdf)
2. Grant LR, et al. 2012. Procedures for Collection of Induced Sputum Specimens from Children. Clinical Infectious Diseases. 2012 Apr 1; 54 (Suppl. 2): S140–S145. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3297553/>
3. Sputum collection instructional YouTube videos: Public Health Madison and Dane County. Home Sputum Collection: A Step-by-Step Guide (English). Also available in other languages. <https://www.youtube.com/watch?v=rIQDP41Qd8s>

