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| TITLE:  Protocol and Standing Orders for Sputum Collection  | EFFECTIVE DATE:  |
| APPROVED BY: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Local Public Health Agency Medical Director (Print Name and Signature)                           (Date)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_LPHA Director (Print Name and Signature)                                                                            (Date) | REVISION DATE: |

**CONDITION FOR PROTOCOL:** To detect *Mycobacterium tuberculosis* (TB) infection in individuals who meet the criteria for targeted testing as defined by the Colorado TB Risk Assessment.

* [Adult Tuberculosis Risk Assessment Form](https://drive.google.com/file/d/1wgtRX81C3EBqZLE08z3WLl5bkwu2ic6g/view)
	+ [User Guide](https://drive.google.com/file/d/0B2o0IwpCuPw7VWJ4SDhYRXVFaFU/view?resourcekey=0-QCKjlL3rSnOviMeRYsHmtg)
* [Pediatric Tuberculosis Risk Assessment Form](https://docs.google.com/document/d/1KJf9FPJXwP8N_h2s8vqI8hsHIxGHb6ts96prOFFxjh0/edit)
	+ [User Guide](https://docs.google.com/document/d/1ApAO11j3NHCLvjcl7PswWQqqScHBU8IucPtg13XYFe0/edit)

**PURPOSE:** To provide clinical staff with medical guidelines for evaluating and managing patients who present for Tuberculosis screening. This document is intended to complement consultation from the TB medical consultant/control officer where appropriate. The RN is the prescriber's agent delegated to refill medications as per the following procedure.

Furthermore, the purpose of this document is to provide guidance for specific acts of tuberculosis (TB) sputum collection services under the authority of CRS 12-38-103 (4), which defines delegated medical function to include the RN implementation of a medical plan as "a written plan, verbal order, standing order, or protocol-whether patient-specific or not, that authorizes specific or discretionary medical action, which may include but is not limited to the selection of medication.[[1]](#footnote-1)"The Local Health Departments may use this guidance to provide services to the patient population they have not been able to provide in the past.

Standing orders (SOs) are written, specific instructions, orders, rules, regulations, or procedures approved by a physician to administer in clearly defined circumstances.

In Colorado, two things limit the independent scope of nursing practice:

* Task/practice must be within the field of nursing, and
* RN must possess the specialized knowledge, judgment, and skill required to complete the job/task undertaken. There is no Board of Nursing requirement for physician oversight of nurses during independent nursing practice. It is important to note that individual facilities may have policies requiring physician oversight[[2]](#footnote-2).

This standing order and protocol aim to provide a standardized practice guideline that appropriately trained healthcare staff to perform nurse-observed sputum collection. If a patient cannot produce a sputum sample spontaneously, the nurse can move to perform sputum induction functions safely and effectively. This document will also serve as a resource for nursing staff.

***For persons adopting these protocols:*** *The criteria listed below include indications, contraindications, and precautions for implementing the TST protocol. However, the criteria must be reviewed* ***and further delineated according to the licensed prescriber's parameters. Additional criteria and prescribed actions may be necessary****. The prescribed actions are examples and may not suit your agency's clinical situation and do not include all possible actions. A licensed prescriber must review the criteria and actions and determine the appropriate action to be prescribed. An annual review of this protocol is suggested.*

**Rules and Regulations Scope of Practice and Delegation:**

* [Licensed Medical Doctor](http://www.aama-ntl.org/docs/default-source/legal/co-bome-rule-800.pdf?sfvrsn=4)
* [Registered Nurses](https://dpo.colorado.gov/Nursing/Laws)
* [Licensed Practical Nurse](https://dpo.colorado.gov/Nursing/Laws)
* [Certified Nurse Assistant](https://casetext.com/regulation/colorado-administrative-code/department-700-department-of-regulatory-agencies/division-716-division-of-professions-and-occupations-board-of-nursing/rule-3-ccr-716-1-nursing-rules-and-regulations/section-3-ccr-716-1-119-rules-and-regulations-for-the-certified-nurse-aide-in-relation-to-medication-aide-authority)
* Medical Assistant: See Medical Assistants under "Personnel"

**Definitions:**

**Acid Fast Bacilli (AFB):** A type of bacteria that causes mycobacterial infections such as tuberculosis. These types of bacteria share the characteristics of acid fastness, meaning a physical property that gives the bacteria the ability to resist decolorization by acids during the staining process.

**Bronchoscopy:** Bronchoscopy is an endoscopic technique of visualizing the inside of the airways for diagnostic and therapeutic purposes. An instrument is inserted into the airways, usually through the nose or mouth, or occasionally through a tracheostomy.

**Chest X-ray (CXR):** Imaging test that uses X-rays to look at the structures and organs in the chest

**Delegation:** Involves the assignment of the performance of activities or tasks related to patient care to unlicensed assistive personnel while retaining accountability for the outcome.

**Expectorant:** An expectorant is a type of cough medicine used to help clear mucus (phlegm) from your airway.

**GeneXpert:** See Nucleic Acid Amplification Test

**Interferon Gamma-Release Assay Test (IGRA):** Whole blood test that can aid in the diagnosis of TB infection. White blood cells from most infected persons with TB will release interferon-gamma (IFN-G) when mixed with antigens derived from *Mtb*. There are two FDA-approved tests: QuantiFERON and T-Spot.

**Nucleic Acid Amplification Test (NAAT):** Rapid molecular testing is used to detect the DNA of *Mycobacterium tuberculosis.* **GeneXpert** and **Polymerase Chain Reaction (PCR)** are common forms of NAAT used in laboratory diagnosis.

**Polymerase Chain Reaction (PCR):** See Nucleic Acid Amplification Test

**Spontaneous sputum sample:** Non-invasive way to collect a sputum sample expectorated from deep within the lungs. A cough is an automatic reflex. When things such as mucus, germs, or dust irritate your throat and airways, your body automatically responds by coughing.

**Sputum:** mucous coughed up from the lungs or respiratory tract.

**Sputum Induction:** Sputum induction is used for patients who have trouble spontaneously producing sputum. The patient inhales nebulized hypertonic saline solution, which liquefies airway secretions, promotes coughing, and allows expectoration of respiratory secretions.

**Standing orders:** Written policy and authorization for nurses to complete specific tasks without first obtaining a physician order.

**Tuberculin skin test (TST):** Medical test to determine whether a person is infected with mycobacteria and is one method to detect tuberculosis infection.

**Viscous:** Thick and sticky, with resistance to flow.

**Personnel**  [**Colorado TB Program Scope of Practice Guidance**](https://drive.google.com/file/d/0B2o0IwpCuPw7SU5iR0tVQUtDVzQ/view?resourcekey=0-HSeGtHXWainvTV_fkqvM1Q)

1. [**Medical Director (Medical Doctor [MD] or Doctor of Osteopathic Medicine [DO]**](https://www.sos.state.co.us/CCR/GenerateRulePdf.do?ruleVersionId=6459&fileName=6%20CCR%201014-6)
2. **Registered Nurse:** This includes various categories of licensed nurses: 1) Nurses in Advanced Practice: a) Advanced Practice Nurse, b) Clinical Nurse Specialist, c) Nurse Practitioner, 2) Registered Nurse. In addition to public and private clinical settings, nurses may practice in a broad range of community locations. Administer medications under their own or delegated authority.

[**Board of Nursing: Practice Act and Laws**](https://dpo.colorado.gov/Nursing/Laws): The statute defines delegated medical function to include the RN implementation of a medical plan, "a written plan, verbal order, standing order, or protocol - whether patient-specific or not, that authorizes specific or discretionary medical action, which may include but is not limited to the selection of medication." The amount of physician oversight would be determined by the physician and Nurse involved in this process.

1. **Medical Assistant:** work alongside physicians, mainly in outpatient or ambulatory care facilities, such as medical offices and clinics. Colorado has **not** set forth a scope of practice for medical assistants. Colorado law states that unlicensed personnel **cannot** perform any duties that require licensing; Colorado medical assistants carry out basic non-invasive routine technical/clinical services and administrative tasks under the delegation and supervision of a licensed medical doctor. An unlicensed person may not diagnose, treat or perform any invasive task **or require assessment**. Per Colorado state statute, "Delegated services cannot be re-delegated to another party by the delegatee."

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ATTACHMENT 1: *Attestation of Authorized Staff*

ATTACHMENT 2: *TB Sputum Induction Protocol*

**A. Indication**

Sputum collection is used as an aid in the diagnosis of pulmonary tuberculosis (TB). The public health nurse (PHN) is authorized to collect sputum on patients they suspect may have pulmonary TB based on symptoms or reports of radiographic findings. Sputum collection should start with the patient attempting to produce a sample through a spontaneous cough, as outlined in the instructions. In patients who are unable to expectorate adequate sputum specimens spontaneously, the PHN is authorized to attempt collection through sputum induction, as outlined in this standing order.

**B. Contraindications**

 It is essential to identify those who may not be suited for this procedure in the home or local public health department setting (LPHA), assuming the LPHA has a negative pressure room or a safe place to perform the procedure. Because our goal is to provide a safe and effective service to our underserved and vulnerable population groups, we have identified those groups below.

1. As hypertonic saline causes bronchoconstriction, the procedure should **only** be performed after pre-medication with salbutamol and under medical supervision (in a medical facility) in patients with:
	* Suspected or confirmed asthma or otherwise severely impaired lung function (including but not limited to COPD or emphysema).
2. Additionally, as the procedure causes severe coughing, the procedure shall **not** be performed in patients in whom severe coughing may be harmful. This may include patients with:
	* hemoptysis of unknown origin
	* acute respiratory distress
	* unstable cardiovascular status (arrhythmias, angina)
	* thoracic, abdominal, or cerebral aneurysms
	* hypoxia (SaO2 less than 90% on room air)
	* lung function impairment (FEV1 less than 1.0 liter)
	* pneumothorax
	* pulmonary emboli
	* fractured ribs or other chest trauma
	* recent eye surgery
3. Patients who are unable to follow instructions.

**C. Precautions**

Staff shall wear the recommended TB respiratory protection (N95 or PAPR) while in the room and disposable gloves when handling sputum specimen(s).

Induction of sputum should only be conducted in a single room with a ventilation system that allows for the total exhausting of air from the room to the external environment. Performing this in the home setting is often limiting. It is advised not to perform this procedure in apartment complexes, communal living environments, or around immune compromised co-inhabitants.

**D. Level of Experience, Training, Competence, and Education Required**

To carry out acts under this standing order, authorized staff must:

* Be a registered nurse with a license in Colorado or a compact state.
* Be an employee or contractor of the Local Health Department whose medical director has written the orders.
* Have reviewed, are familiar with, and able to readily access the recommendations within the state TB policies and procedures relevant to TB sputum specimen collection, packaging, and shipping.
* Have undergone an evaluation of competence relevant to TB sputum collection services within 12 months prior to signing and providing TB sputum collection services:
* Initial evaluation of competence is performed by the authorizing physician, the staff's supervisor, or clinical designee and consists of education and skills training.
* Have reviewed and signed this SDO, **ATTACHMENT 1: *Attestation of Authorized Staff***, within 12 months before providing services under this standing order.

**E. Method of Maintaining a Written Record of Authorized Staff**

A record of the authorized staff who completes the required training and demonstrates competence shall be documented and maintained by the staff's supervisor in the local health department.

**F. Authorized Delegated Acts**

Authorized staff may provide TB sputum collection services under this standing order to clients undergoing evaluation for TB disease and who cannot produce sputum via expectorant. Performing this task requires medical judgment, assessment, and critical thinking skills.

It is the intent of all parties that the acts performed under this standard order shall be in compliance with the Colorado Nursing Practice Act and the rules promulgated under those Acts.

**G. Procedures and Requirements to be followed by Authorized Staff (**[**Standard Skills for Consistent Care, 2021**](https://elsevier.health/en-US/preview/specimen-sputum-peds)**)**

* + - * Adhere to all Standard Precautions, including bloodborne and respiratory precautions, when participating in TB sputum collection procedures.
			* Utilize interpreter services to facilitate client and staff communication as it relates to limited English proficient (LEP) clients. Medically trained interpreters should be used for all patient discussions. Family members or friends shall not be used to provide interpretation services.
			* Verify the client meets the criteria for TB sputum collection via induction (i.e., no contraindications as noted earlier and attempts have been made to collect via expectorant and were unsuccessful).
			* Ensure, to the extent possible, that the client seen for TB sputum collection services is whom the person claims to be.
			* Ensure that the client's consent and signature have been obtained. If consent and signature have not been obtained, then obtain consent and signature according to the local agency policy and applicable signed consent forms.
			* Ensure that copies of the following have been provided to the client.
* **Copies of the privacy notices and signed consent have been provided to the client.**
* ***General Consent and Disclosure***, available at: (see attached)
* ***CDPHE Privacy Notice***, available at: <https://www.colorado.gov/pacific/cdphe/privacy-notice>
* ***Local Public Health Privacy Notice,*** available at: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ - * Explain the TB sputum collection process. Discuss with the client the risks and benefits of sputum collection. Provide the opportunity for the client to ask questions.

**Patient Education:**

* 1. Provide developmentally and culturally appropriate education based on the desire for knowledge, readiness to learn, and overall neurologic and psychosocial state.
	2. Demonstrate effective coughing techniques versus clearing of the throat. Stress the importance of deep cough. Explain the difference between saliva and sputum.
	3. Demonstrate the splinting technique for a patient with abdominal or thoracic incisions.
	4. Explain to the patient and family the purpose of avoiding food intake and the use of mouthwashes and toothpaste before sputum expectoration.
	5. If an aerosol treatment is indicated, teach the patient and family the purpose of the procedure, explaining that it stimulates coughing and sputum expectoration.
	6. Instruct the patient and family to avoid contaminating the outside of the specimen cup to reduce the risk of spreading infection.
	7. Encourage questions and answer them as they arise.
	8. Show the following video to the patient: Home Sputum Collection: Step-by-Step Guide [[video](https://www.youtube.com/watch?v=8DbGSgRuBZA)]

 **Assessment:**

1. Perform hand hygiene before patient contact. Don additional appropriate PPE based on the patient's need for isolation precautions or risk of exposure to bodily fluids.
2. Introduce yourself to the patient and family.
3. Verify the correct patient using two identifiers.
4. Determine the patient's ability to assist with the collection.
5. Check the practitioner's orders for the type of sputum analysis and specifications (e.g., amount of sputum, number of specimens, time of collection, method of obtaining samples) and initiate appropriate isolation precautions until the results are obtained.
6. Assess the patient's ability to cough and expectorate a specimen.
7. Determine when the patient last ate. Suctioning or coughing up secretions can trigger the gag reflex. If the patient has recently eaten, this may also trigger vomiting.
8. Determine the type of assistance the patient needs to obtain a specimen.
9. Assess the patient's respiratory status, including respiratory rate, depth, pattern, and the color of mucous membranes.
10. Assess the patient's and family's understanding of the reasons for and the risks and benefits of the procedure.
11. Observe and monitor the patient's respiratory status throughout the procedure and stop collection efforts if any signs of distress are present. Rationale: Excessive coughing or prolonged suctioning can alter the respiratory pattern and cause hypoxemia.
12. Observe the character of the sputum, including color (including blood), consistency, odor, volume, and viscosity. Rationale: Abnormal characteristics may indicate disease entities. Report any unusual characteristics to the practitioner.
13. Report all events or abnormal findings to the practitioner, including AFB findings.
	* + - Collection through spontaneous cough:
14. Gather the required supplies and prepare to collect the sputum sample.
15. Label the sterile sputum collection tube with the patient's name, date of birth, specimen type, and date before obtaining TB sputum specimen and before giving the container(s) to the client for specimen collection.
16. Provide the following instructions to the client:
	1. Rinse mouth well with water to avoid contamination with food particles and bacteria. TB sputum specimen collection should occur before eating or drinking anything, including brushing teeth.
	2. Inhale deeply two to three times, and breathe out hard each time.
	3. Cough deeply from the chest. A deeply coughed specimen is required (not saliva or nasal secretions).
	4. Place the open container close to the mouth to collect the TB sputum specimen. The ideal specimen size is 5 to 10 mL, but 3 to 15ml is acceptable. Sputa is thick and usually colored. If the sample is watery and bubbly, it is likely saliva and should not be submitted for testing.
	5. Avoid contaminating the inside of the container and lid by contact with the mouth or hand.
	6. Close the lid tightly and place the tube into the TB sputum specimen bag.
17. If the client will collect TB sputum specimens at home, instruct the client to store the TB sputum specimen(s) in a refrigerator until samples are transported to the clinic as soon as possible (or mailed with a cold pack, as resources allow, directly to the laboratory).
18. If the client is unable to produce early morning sputum, suggest that they stand or sit in a steamy environment for 15 minutes after running hot water in the shower, if possible, just before attempting collection.
	* + - It is recommended to observe sputum collection. If all three cannot be observed, supervise at least the first TB sputum collection to document that the client demonstrates the correct technique. The client should be capable of and motivated to provide a good specimen and fully adhere to the instructions **before** allowing the patient to self-collect further samples. Again, the best practice is to have all be nurse-observed collections. Additional considerations are:
* Three TB sputum samples should be collected at least eight hours apart, preferably at least two being collected within an hour or so of the person waking up. This usually is early morning but will depend on the person's schedule.
* Fasting sample: **Ensure that the patient does not eat or use mouthwash or toothpaste because they may decrease the viability of the microorganisms and alter the culture results.**

**ALERT:** If the client is unable to produce an acceptable TB sputum specimen, follow the procedure for TB sputum induction (as outlined in **ATTACHMENT 2: *Sputum Induction Procedure***) if resources are available.

**Expected Outcomes**

* The patient's respirations are the same rate and character as before the procedure.
* The patient or family is able to discuss the purpose and benefit of sputum collection.
* An adequate sputum sample is obtained.
* Sputum is not contaminated by saliva or oropharyngeal flora.
* The patient maintains adequate oxygen saturation levels.
* The patient tolerates the procedure without pain or discomfort.

**Unexpected Outcomes:**

* Patient becomes hypoxic, requires increased respiratory rate and effort, or feels short of breath.
* Oxygen saturation levels drop after the procedure and do not improve after the procedure is completed.
* Patient experiences arrhythmia.
* The patient remains anxious or expresses discomfort.
* The specimen contains saliva.
* The specimen contains blood, pathogenic organisms, or abnormal cells.
* An inadequate amount of sputum is collected.
* The patient complains of or exhibits pain when coughing to produce sputum.
* Nasopharynx mucosal lining is damaged or edematous.

**Packaging**

* + - * Once a TB sputum specimen is obtained, label and correctly package the sample (i.e., date and time of collection as well as the specimen type) according to shipping requirements and regional procedures. Submit the TB sputum specimen to the Colorado Department of Public Health and Environment Laboratory for processing.
* TB sputum specimens must be packed in triple containment with sufficient absorbent material enclosed to absorb the entire volume of liquid. The container used *must* meet current DOT and the United States Postal Service regulations.
* Complete the lab requisition form. The information on the collection tube must match the information provided on the requisition form.
* If the TB sputum specimens cannot be delivered to the laboratory within 1 hour of collection, the samples must be refrigerated. Ship the refrigerated TB sputum specimens with a cold pack to the laboratory as soon as possible.

**H. Client Record-Keeping Recommendations**

Authorized staff shall accurately and completely report and document each delegated act in a medical record prepared in accordance with local policy and regional procedures, which shall include:

1. Names of personnel involved in the evaluation and treatment at each visit, including the name of the interpreter (if an interpreter is used).
2. Date and time of collection, type of test ordered, and laboratory receiving specimen.
3. Actions were carried out under these standing orders, including methods used.
4. Any additional physician orders.
5. Patient's tolerance of procedure and response(s).
6. Characteristics of the sputum specimen.
7. Contacts with other healthcare team members concerning significant events regarding the client's status.
8. Isolation and PPE precautions used.
9. All patient communication, including education provided, their consent, and any questions.
10. Documentation that the appropriate forms are completed and included in the medical record if required, and copies, when applicable, are provided to the client.

**I. Scope of Supervision Required**

This standing order gives the authorized nursing staff the authority to perform the acts described in this standing order in consultation with the authorizing physician.

**J. Specialized Circumstances to Immediately Communicate with the Authorizing Physician**

Specific circumstances that the authorized nursing staff providing services under this standing order should immediately contact the authorizing physician by phone include, but are not limited to, when medical direction or consultation is needed.

In an emergency situation, the authorized staff is to call 911, provide care according to their skills and ability, and contact the authorizing physician by phone as soon as possible after the patient has been stabilized or transported to the hospital.

**K. Limitations on Setting**

Authorized nursing staff can provide services under these standing orders in the clinic setting, in the client's home, or in other field settings when the authorizing physician can be contacted by phone.

**L. Date and Signature of the Authorizing Physician**

This standing order shall become effective on the date that it is signed by the authorizing physician below and will remain in effect until it is either rescinded upon a change in the authorizing physician or at the end of business on the last day of the current

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fiscal year (\_\_\_\_\_\_\_\_\_\_), whichever is earlier.

 *Local health department year*

Authorizing Physician’s Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Authorizing Physician’s Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Printed Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Effective Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Emergency Contact Information: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**ATTACHMENT 1: *Attestation of Authorized Staff***

I, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have read and understand the

 printed name of authorized staff

*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Standing Delegation Orders for Tuberculosis Sputum*

 Local Health Department Medical Director

*Collection Services Provided by Authorized Staff, Fiscal Year \_\_\_\_, standard order* that was signed by

Dr.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 printed name of authorizing physician date of authorizing physician's signature

* I agree that I meet all qualifications for authorized staff outlined in the standing order.
* I agree to follow all instructions outlined in the standing order.

Signature of Authorized Staff Date

**ATTACHMENT 2: *TB Sputum Induction Procedure***

1. Obtain and assemble a nebulizer tubing kit.
2. Attach one end of the air tubing to the compressor unit and the other to the nebulizer medication cup outlet.
3. Educate and orient the patient to the process of sputum induction, the approximate length of the treatment, the expected outcome, and what to do with the sputum if they should produce a sputum sample during the process. Answer any questions they may have.
4. With the machine turned off, prepare the nebulizer equipment as per package instructions. Add approximately 3 mL-5 mL of sterile 0.9% sodium chloride (NaCl) solution to the nebulizer medication cup.
5. Have the patient hold the mouthpiece while you, the nurse, turn on the compressor. Then instruct the patient to place the mouthpiece into their mouth, close lips around the mouthpiece, and breathe in and out slowly and deeply.
6. Encourage and remind the patient to take slow deep breaths.
7. After a few minutes, encourage cough if no spontaneous coughing occurs.
8. Continue procedure until the cough is stimulated, adding more sterile 0.9% NaCl solution as needed.
9. When a cough is stimulated, encourage its repetition several times to obtain an adequate specimen (at least 5 mL).
10. Upon completion, turn off the nebulizer.
11. Label and package the TB sputum specimen correctly and legibly (Patient name, DOB, specimen type being "induced sputum," date, and time of collection). Also, mark lab requisition as "induced specimen."
12. Disassemble mouthpiece and disinfect nebulizer according to manufacturer instructions. If further specimens are necessary, clean the tubing and leave it open to the air in the patient's home.

1. Scopes of Practice for Registered Nurses (RNs). (2018). Retrieved from <https://www.colorado.gov/pacific/dora/Nursing_Laws> on 11/08/2018. [↑](#footnote-ref-1)
2. Scopes of Practice for Registered Nurses (RNs). (2018). Retrieved from <https://www.colorado.gov/pacific/dora/Nursing_Laws> on 11/08/2018. [↑](#footnote-ref-2)