

SPUTUM INDUCTION IN CHILDREN SUSPECTED OF HAVING PULMONARY TUBERCULOSIS - SCHN PROCEDURE®

DOCUMENT SUMMARY/KEY POINTS

- In consultation with Respiratory Medicine or Infectious Diseases, medical teams may request induced sputum samples in patients where the diagnosis of ***Pulmonary Tuberculosis*** (TB) is suspected.
- The therapist must wear appropriate PPE for airborne precautions including gloves, a long sleeve impervious gown, a high filtration N95 (duck bill mask) (and eye protection whilst in the room with the patient. (as per SCHN PPE Policy Number **1/C/16:9029-01:00**)
- Sputum induction should be performed in an isolation room and where possible in a negative pressure isolation room.

CHANGE SUMMARY

- Document due for mandatory review.
- Replaces SCH document C.10.04 of similar title.
- The time required to wait between collection of multiple samples has been modified
- The equipment cleaning procedure has been modified

READ ACKNOWLEDGEMENT

- **Read Acknowledge Only** – Respiratory and After Hours Physiotherapists, Infectious Diseases Team

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1 st December 2016	Review Period: 3 years
Team Leader:	Manager	Area/Dept: Physiotherapy

Policy:

Physiotherapists are able to collect induced sputum samples in patients suspected of having pulmonary tuberculosis (TB) at the request of the admitting team after consultation with the infectious diseases or respiratory medicine teams.

This policy describes the process when induced sputum is requested to specifically assess for the presence of TB.

Procedure:

General Information:

- The referral must be made by the medical staff.
- Medical staff must complete appropriate pathology request forms and chart hypertonic saline 6% for inhalation prior to the procedure (hypertonic saline 3% may need to be used in patients who do not tolerate 6%, ie. excessive coughing, bronchospasm, O₂ desaturation).
- Use of an ultrasonic nebuliser requires 20ml of hypertonic saline to be charted. Use of a breath enhanced jet nebuliser requires 4-6ml hypertonic saline to be charted. The physiotherapist accepting the referral will advise on quantity needed depending on the equipment available.
- Salbutamol may be charted if clinically indicated e.g. child has history of asthma or reactive airways.
- The service is generally available between 0800 and 1700 Monday to Friday. The treating team will discuss requests outside of these hours with the physiotherapy team when clinically indicated or to assist with discharge home.
- One sample is to be collected on three separate occasions.

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- Samples are to be collected each morning for 3 consecutive mornings or, alternatively, 3 consecutive samples may be collected on the same day, 4 hours apart, on request of the Infectious Diseases Team when enough notice is given, i.e. 0800, 1200 and 1600.

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- Samples are to be collected on three separate occasions, ideally 4 hours apart to allow for sufficient time between hypertonic saline administration. Alternate timeframes should be as agreed with the Medical or Infectious Diseases Team.

Safety Issues - Patients:

- If the patient requires medication with bronchodilator, this is to be delivered by nursing staff 10 minutes prior to the procedure as per the medication chart.
- SpO₂ must be monitored throughout the procedure and O₂ therapy must be available and utilised as necessary to maintain an acceptable SpO₂ for that patient. The physiotherapist must also auscultate and observe work of breathing prior to, during and following the procedure to assess patient tolerance of the procedure.

Safety Issues - Therapists:

- The sputum induction must be performed in an isolation room and where possible in a negative pressure isolation room within the hospital.
- The therapist must wear appropriate PPE for airborne precautions including gloves, a long sleeve impermeable gown, a high filtration duck bill mask (N95) and eye protection whilst in the room with the patient. (as per SCHN PPE Policy Number **1/C/16:9029-01:00**)

Equipment:

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- A low output ultrasonic nebulizer is to be used. This is kept on the sputum induction trolley in the Physiotherapy Department on level 0.
- A sterile circuit must be used Hypertonic saline should be drawn up by the nursing staff after prescription in the medication chart in consultation with the treating physiotherapist.
- **Note:** If the ultrasonic nebulizer is not available a breath enhanced jet nebulizer e.g. Pari LC Sprint may need to be used after consultation with the referring team

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- A Breath enhanced jet nebuliser, e.g. Pari LC Sprint is used for administration of hypertonic saline
 - Pari LC sprints can be sourced from the ward, Inhalation Therapy Department or the Physiotherapy Department
- A specimen jar or sputum trap with appropriate sized suction catheter and vial of normal saline should be taken into the room at the time of sputum induction
- Additional airway clearance equipment as required on an individual patient basis

Method of Sputum Induction:

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- Nursing staff to pre-medicate patient with bronchodilator 10 minutes prior to procedure if this has been prescribed.

- O2 therapy must be available and utilised to maintain SpO2 in the normal range.
- The physiotherapist is to half fill the ultrasonic nebuliser chamber with tap water.
- The medication cup is to be attached to the underside of the lid of the medication chamber.
- 20mL of Hypertonic Saline 6% is to be poured into the medication cup. (If Hypertonic Saline 3% is required, add 10mL of Hypertonic Saline and 10mL of sterile 'water for injections' into medication cup). The nurse is responsible for drawing up the correct volume and concentration of hypertonic saline.
- Attach the sterile circuit to the ultrasonic nebuliser.
- Turn on the ultrasonic nebuliser and set the output to approximately 50% of maximum.
- Patient is to breathe in and out through the mouthpiece using slightly greater than normal tidal volumes.
- After no more than 15 minutes of inhalation, patient is to remove the mouthpiece, take some deep breaths then perform huffing and coughing and airway clearance techniques if deemed appropriate by the physiotherapist to produce a sample.
- Where possible sputum samples will be obtained with huffing and coughing, however when samples are unable to be collected this way, Physiotherapists will perform oropharyngeal suction
- The medication cup may need to be refilled with additional Hypertonic Saline during the procedure.
- The sample needs to be transported to the lab promptly after collection.

If sputum induction is not successful in obtaining a sputum sample, the treating team must be immediately notified.

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- Nursing staff to medicate patient with bronchodilator 10 minutes prior to procedure if this has been prescribed
- O2 therapy must be available and utilised to maintain SpO2 in the normal range
- Nursing staff will load hypertonic saline into the LC Sprint
- The LC Sprint is attached to the air outlet with a flow of 4-5L/min
- A mask or mouthpiece interface will be selected at the Physiotherapist's discretion
- In age-appropriate patients the Physiotherapist will direct Active Cycle of Breathing Technique during inhalation of the hypertonic saline and incorporate high sitting and side-lying positioning as appropriate
- The hypertonic saline nebuliser will be continued until the nebuliser is completed or until an appropriate sample has been obtained
- Where possible sputum samples will be obtained with huffing and coughing, however when samples are unable to be collected this way, Physiotherapists will perform oropharyngeal suction

- The sample will be transported promptly to the laboratory

If sputum induction is not successful in obtaining a sputum sample, the treating team must be immediately notified.

Note for children too young to expectorate samples:

- A jet nebuliser with face mask should be used to deliver the nebulised hypertonic saline to children unable to use a mouthpiece (approximately < 4 years).
- Following no more than 15 minutes of inhalation in these young children, oropharyngeal suction is to be performed with the aim of cough stimulation to bring sputum above the larynx from where it can be suctioned.
- 3 samples need to be collected in this manner

Cleaning:

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- Following the procedure, all equipment is returned to the physiotherapy department.
- The circuit is to be disassembled.
- All components of the 3-way mouthpiece are to be washed in warm soapy water, rinsed clean then air dried.
- The dry 3-way mouthpiece and tubing that goes from the chamber to the 3-way mouthpiece are to be placed in the 'used respiratory equipment' container in the physiotherapy department.
- The physiotherapy assistant is responsible for taking used circuits to CSSD and collecting them after sterilisation.
- The water chamber, medication cup and chamber lid are to be rinsed out thoroughly with tap water and allowed to air dry. These parts do not go to CSSD.
- The machine and trolley are to be wiped down with alcohol impregnated wipe e.g. 'Isowipe'.

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- If nebuliser equipment is going to be used for ongoing treatments, the equipment is separated into its individual pieces, washed in warm soapy water and left to air-dry at the patient's bedside
- If the nebuliser equipment is no longer required, it should be separated into its individual pieces, bagged and returned to the Physiotherapy Department where it is taken to Inhalation Therapy for cleaning by the Physiotherapy Assistant.

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