

Standard Operating procedures for Gastric lavage/aspiration; Mantoux and Sputum induction (Adapted from the Childhood TB Desk Guide revised 2018)

How to perform a Paediatric Gastric Aspiration

Materials required:

1. Gloves
2. Nasogastric tubes 8-10FG
3. Sputum container
4. 5, 10 or 20 ml syringes
5. Sodium Bicarbonate (8.4%)
6. Normal saline or sterile water
7. Lab request forms
8. Alcohol/Methylated spirit
9. Litmus paper

PROCEDURE

1. Instruct the parent/guardian regarding overnight fasting of at least 4 hours before early morning gastric aspirate (GA). The procedure is preferably performed early in the morning when the child comes to the outpatient clinic or in the ward if child is an in-patient. The procedure may also be performed during the daytime, as long as the child has been kept nil per os (NPO) for minimum 4 hours.
2. Use an assistant to help as this procedure requires 2-3 people.
3. Prepare all the materials for the procedure.
4. Position the child lying on the back.
5. Measure the distance of the nasogastric tube to the stomach (from tip of nose, to ear lobe, to xiphisternum) : this estimates the distance that will be required to insert the tube.
6. Place the child's face in the "sniffing air" position, and pass the nasogastric tube from the nose into the stomach.
7. Withdraw gastric contents using the syringe attached to the nasogastric tube and place in the sputum container.
8. If < 1ml is aspirated, insert 5-10ml of sterile water or normal saline down the tube, leave for three minutes, and then aspirate until a minimum of 5-10ml aspirate is obtained. Do not repeat more than 3 times.
9. Add an equal volume of sodium bicarbonate solution to the specimen jar (in order to neutralize the acidic gastric contents and so prevent destruction of tubercle bacilli).
10. Tightly secure the lid and wipe the container with 70% alcohol to prevent cross-infection.
11. Fill out the laboratory request forms.
12. Transport the specimen (in a cooler box) to the laboratory for processing as soon as possible.
13. Place the specimens in a refrigerator (4-8°C) if it is likely to take more than 4 hours for the specimens to be taken to the laboratory.

Ref: *Guidance for national programs on the management of tuberculosis in children*. Geneva, World Health Organization, WHO/HTM/2014.03.

How to perform a Tuberculin Skin Test (Mantoux)

The Mantoux TST measures the delayed type hypersensitivity response to purified protein derivative (PPD)- a protein precipitate of inactivated tubercle bacilli. A positive mantoux only indicates exposure to tubercle bacilli and latent TB infection not active disease. A negative test does not exclude TB infection or disease.

Materials required:

1	Tuberculin/1ml syringe
2	A 27-G needle
3	5 TU of tuberculin PPD-S

PROCEDURE

1. Locate and clean injection site free of scars, sores and veins, 5-10 cm below the elbow joint using an alcohol swab.
2. Draw up 0.1ml of tuberculin into the syringe.
3. Inject the solution between the layers of the skin keeping the needle almost parallel (5-15°) to the skin with the bevel pointing upwards.
4. After injection, a small wheal of 8-10mm should form at the infection site. If not, the PPD was injected too deeply and the test should be repeated at a site at least 5cm away from the original site.
5. Record the date, site location in the child's notebook or hospital notes.
6. The results should be read between 48 and 72 hours after administration. Instruct the caregiver on when to bring back the child for reading.
7. Inspect the injection site and use the fingertips as a guide for marking the widest edges of induration (swelling) across the forearm. Note that the inflammatory reaction to the PPD may show as redness of the skin, swelling and or blistering. The reaction may be difficult to see in dark skinned individuals - make sure to inspect injection site thoroughly for inflammatory changes.
8. Mark the edges of the swelling with a pen and measure the exact distance between the two points in millimetres.
9. Only record measurement in millimetres not as "positive" or "negative".

Interpreting the results

Positive TST	Normal immunity	Defective immunity (HIV infected, severely malnourished, severe illness such as TBM/miliary TB)
	≥10mm	≥5mm

The following can cause a false-positive or false-negative TST.

Causes of false-negative TST	Causes of false positive TST
<ul style="list-style-type: none"> • HIV infection • Malnutrition • Severe viral infections (eg measles, chicken pox) • Cancer • Immunosuppressive drugs (eg steroids) • Severe disseminated TB 	<ul style="list-style-type: none"> • BCG vaccination • Infection with non-tuberculous mycobacteria



Correct Measurement



Incorrect Measurement

How to perform Sputum induction

Background

It is important to note that, unlike gastric aspiration, sputum induction is an aerosol generating procedure. Where possible, therefore, this procedure should be performed in an isolation room that has adequate infection control precautions (negative pressure, ultraviolet light (turned on when room is not in use) and extractor fan). The procedure can also be carried out in an open space with both health workers and caregivers wearing the appropriate protective mask (N95).

Sputum induction is regarded as a low-risk procedure for the child to be evaluated for TB. The very few adverse events that have been reported include coughing spells, mild wheezing and nosebleeds. Recent studies have shown that this procedure can safely be performed even in young infants, although staff will need to have specialized training and equipment to perform this procedure in such patients.

Examine children in advance to ensure they are well enough to undergo the procedure.

Contraindications

- inadequate fasting less than 3 hours,
- severe respiratory distress (including rapid breathing, wheezing, hypoxia);
- high risk of bleeding: bleeding tendency, severe nosebleeds, low platelet count, (symptomatic or platelet count <50/ml blood);
- reduced level of consciousness;
- history of significant asthma (diagnosed and treated by a clinician).

Equipment required

- Pressurised air or oxygen tank
- Disposable nebulization kit
- Normal saline or sterile water
- 3-5% hypertonic saline
- Salbutamol respiratory solution
- Feeding tube size 5-6gloves
- syringe of capacity 5, 10, 20 or 30 ml, with appropriate connector for the feeding tube
- litmus paper
- specimen container
- pen (to label specimens)
- laboratory requisition forms
- alcohol/chlorhexidine
- N95 masks or other appropriate mask

Other equipment as needed for expectoration of sputum

Procedure

1. Administer a bronchodilator (e.g. salbutamol 2.5mg if less than 5 years, salbutamol

5mg if 5 years or older) to reduce the risk of wheezing.

2. Administer nebulized hypertonic saline (3% NaCl) for 15 minutes or until 5 ml of solution have been fully administered. Nebulize with flow rate >7l per minute

3. Carry out chest physiotherapy if necessary; this is useful to mobilize secretions.

4. For older children who are able to expectorate, follow procedures as usual for expectoration

5. For children who are unable to expectorate (e.g. young children), carry out nasopharyngeal aspiration to collect a suitable specimen.

Any equipment that will be reused must be disinfected and sterilized before use for a subsequent patient.

