

PAEDIATRIC NURSING PRACTICE MANUAL
SECTION 3

GENERAL CARE OF THE SICK CHILD

3.3 NUTRITION

3.3.2 INSERTION OF A NASOGASTRIC TUBE

3.3.2.1 TESTING THE PLACEMENT OF A NASOGASTRIC TUBE

Aim

To confirm the location of a nasogastric tube in the stomach

Key points

This policy applies to infants and children above the age of 28 days. Refer to the neonatal guidelines for neonates.

For unblocking of nasogastric tubes refer to [PNPM 3.3.3 Oro/Naso Gastric Tube Feeding](#).

Patients at High Risk for Tube Placement Errors or Accidental Dislodgment¹

- Comatose or semi-comatose patients
- Patients with a swallowing dysfunction
- Patients with recurrent or violent vomiting or retching

When to verify/test tube position²⁻⁵

1. Following initial insertion.
2. Immediately prior to administration of each bolus feed, fluids or medications. (If patient on acid inhibiting medication, wait as long as possible after administration of this medication before testing subsequent aspirates).
3. At least once per shift for continuous feeds. Consider stopping feeds for one hour prior to testing if possible.
4. Following episodes of vomiting, retching or coughing (note that absence of coughing does not ensure correct tube placement).
5. If displacement is suspected for any reason (eg. accidental pulling of tube, loose tape).

PROCEDURE	ADDITIONAL INFORMATION
<p>Confirm the measured cm mark is aligned at the nare ie.insertion length.</p> <p>or</p> <p>if no cm marks, confirm indelible ink mark and measurement of external tube.⁶</p>	<p>This indicates whether the tube has been displaced. It is no help in distinguishing if the tube tip has migrated internally.⁷</p>

PROCEDURE	ADDITIONAL INFORMATION
Using 20mL or 50mL enteral feed syringe ± adaptor, aspirate 0.5 to 1mL of fluid and apply aspirate to pH testing paper, read according to manufacturer's instructions. Note colour, appearance and volume of aspirate.	Measuring the pH of withdrawn fluid is helpful in differentiating between respiratory and gastric placement when gastric pH is low. ⁷ Antacid medication or continuous feeds may raise the gastric pH.
If aspirate is pH 5.5 or below commence feed.	A pH of 5.5 or less indicates the tube tip is in a gastric location. ⁸
If aspirate is above 5.5 DO NOT FEED, wait 30-60 minutes and repeat testing procedure. If pH remains above 5.5 seek help from an experienced nurse or medical officer and refer to "Factors To Consider When Undertaking A Risk Assessment."	When gastric pH is >6.0, using pH to predict tube placement is of no benefit. pH of a feeding tube cannot identify if it is in the oesophagus. The oesophageal pH may be as low as 1 because of refluxed gastric fluid, or as high as 7.0 probably due to recently swallowed saliva.
If unable to aspirate gastric contents: <ol style="list-style-type: none"> 1. If possible turn patient onto side. 2. Inject 1-5mL of air using a 20mL or 50 mL enteral feed syringe and re-aspirate. 3. If no aspirate, wait for 15-30 minutes, leave the tube on free drainage ensuring the tube is at a lower level than the patient. 4. Re-aspirate, if no aspirate obtained advance or retract the tube by 1-2 cm. 5. Re-aspirate, if no aspirate obtained consider replacement/repassing of tube and/or checking position by x-ray. 	Injecting air through the tube may dislodge the exit-port of the feeding tube from the gastric mucosa increasing the probability of success. ⁹ Gravity may assist with drainage of aspirate. X-rays should not be undertaken routinely. If undertaking x-ray for other reason then check nasogastric tube site also.
If there is any doubt about the position of the tube, seek help from an experienced nurse or Medical Officer. If there is still doubt remove the tube and repeat the procedure. Carry out a risk assessment to balance the potential risks with the need to feed and document – See below for "Factors to Consider when Undertaking a Risk Assessment."	
Ensure the tube is secure after testing.	
Document actions and rationale, measurement of tube inserted, advancement or retraction, pH of aspirate, appearance and volume of aspirate.	
Report any misplaced tubes.	Utilise organisation reporting systems.

THE FOLLOWING METHODS ARE NO LONGER ENDORSED AT PRINCESS MARGARET HOSPITAL AND SHOULD NOT BE USED:

Recent publications reporting complications arising from NGT tube displacement have questioned the safety of some common testing methods. These methods include:

Auscultation for air insufflated through the feeding tube

The efficacy of this method is highly questionable. Although there is no evidence that the auscultatory method is effective in ruling out respiratory placement there are multiple anecdotal reports of its ineffectiveness leading to disastrous results on occasions.^{2, 10-16}

Testing the acidity/alkalinity of aspirate using litmus paper

Litmus paper is not adequately sensitive to distinguish between gastric and bronchial secretions.^{1, 2}

Monitoring bubbling at the end of the tube

Observing for bubbling at the proximal end of the tube is unreliable because the stomach also contains air and could falsely indicate respiratory placement.¹⁷

THE FOLLOWING METHODS CANNOT BE RELIED ON SOLELY AS A BEDSIDE TEST BUT MAY PROVIDE ADDITIONAL INFORMATION TO SUPPORT CORRECT TUBE PLACEMENT:

Signs of respiratory distress or inability to speak

Small bore tubes may cause few or no symptoms when incorrectly positioned, particularly in high risk patients such as unconscious, intubated, without a gag or swallow reflex, or uncooperative during procedure. Observing for signs of respiratory distress such as choking or cyanosis is often ineffective in detecting a malpositioned tube, especially in unconscious or debilitated patients.¹⁷⁻¹⁹

Appearance of fluid withdrawn from the feeding tube

Significant difficulties in identifying respiratory secretions compared with gastric secretions are reported in the literature and therefore this method cannot be relied on solely to determine correct tube placement.^{7, 10, 11, 20-22}

Colour	Origin	Additional information
Colourless	Gastric	Colourless often with shreds of off-white to tan mucous.
Light yellow	Gastric	Presumable result of refluxed bile into the stomach with an alkaline pH.
Brown	Gastric	Indicates presence of blood partially digested by hydrochloric acid.
Grassy green	Gastric	Result of refluxed bile acted upon by hydrochloric acid.
Light to dark golden yellow	Small bowel	Bile-stained, generally more transparent and thicker consistency than gastric aspirates.
Brownish-green	Small bowel	Bile stained, generally more transparent and thicker consistency than gastric aspirates.
Off white	Respiratory	Contains fluid from tracheobronchial tree.
Straw coloured, watery	Respiratory	Pleural fluid, may be blood tinged.

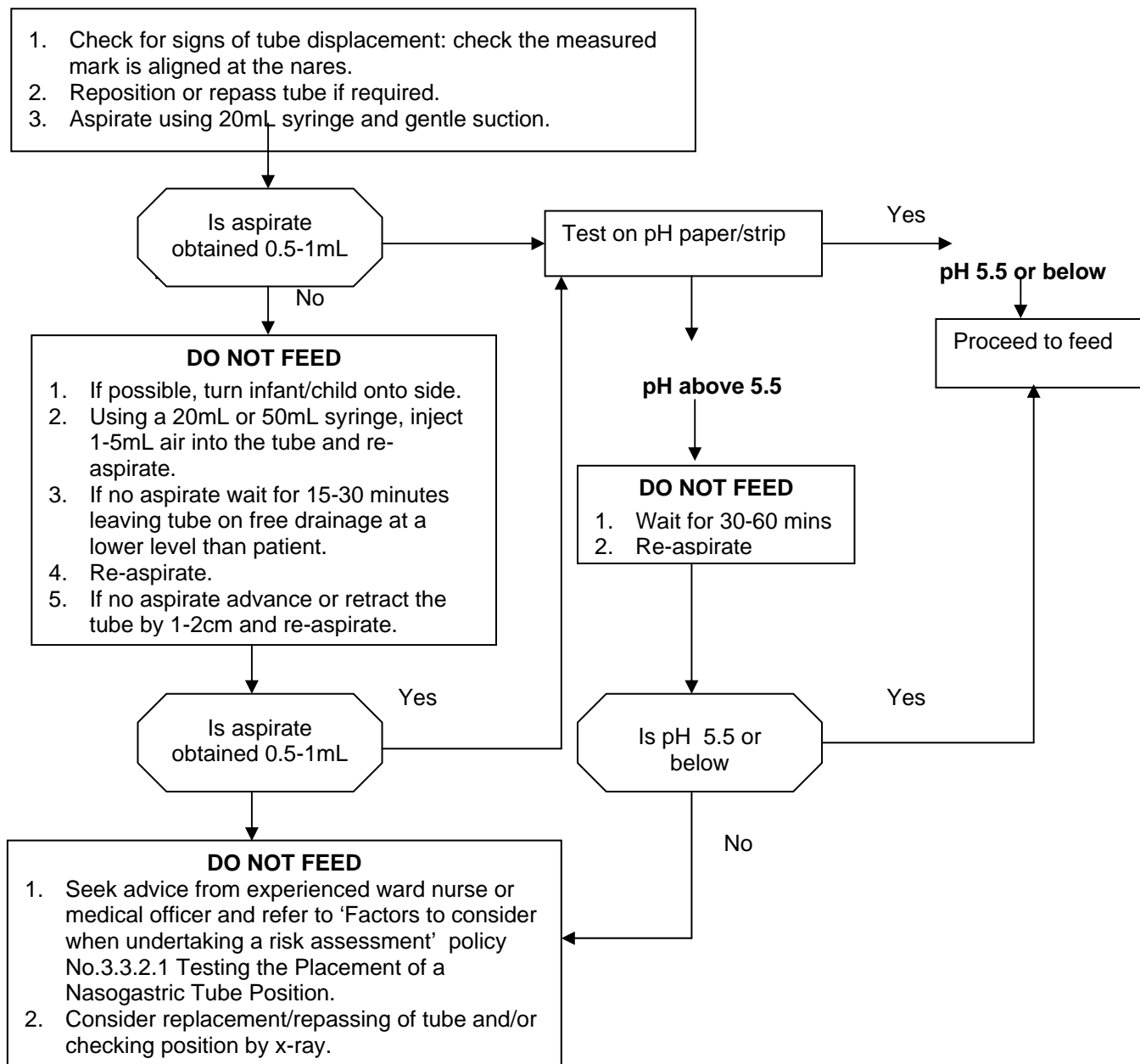
Volume of fluid withdrawn from the feeding tube

As aspirate volume of >50mL is more likely to be from a feeding tube in the stomach as opposed to the small bowel.²⁰

Confirming the Correct Position of Nasogastric Feeding Tubes in Infants and Children

(For infants less than 4 weeks refer to Neonatal Policy)

This Flowchart is to be read in conjunction with Policy No.3.3.2.1 Testing the Placement of a Nasogastric Tube Position



CAUTION: If there is **ANY** query about position and/or the clarity of the colour change on the pH strip, particularly between ranges 5 and 6, then feeding should not commence.

DOCUMENT actions and rationale, length of the tube, appearance, volume and pH of aspirate, and length of tube advancement/retraction.

FACTORS TO CONSIDER WHEN UNDERTAKING A RISK ASSESSMENT

A thorough risk assessment and team discussion should be carried out and any decisions about the feeding regime of the patient documented. The multidisciplinary care team should discuss possible actions to take and record how they reached their decision. This must be based on balancing the risks between not feeding a baby in the short term, when there is a possibility of the tube being in the lungs.

Is patient in a high-risk category for tube migration?

Patients in a high-risk group will have a higher risk of tube migration

Are there any concerns the tube has migrated?

Is the external length of the tube correct?

For continuous feeds, are feeds being tolerated without any signs of distress?

Is patient on continuous feeds or frequent feeds?

This may increase pH of aspirate

Is patient on acid inhibiting medication?

This may increase pH of aspirate

What are the previous aspirate trends of pH, volumes and appearance?

A sudden alteration to trends may indicate change of internal tube position

Is the aspirate typical of gastric secretions?

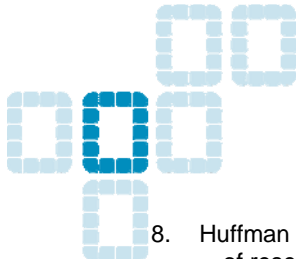
Although this cannot be relied on solely as a bedside test it may provide additional information to support decision making within the risk assessment process.

Have tube position concerns arisen previously? How were they resolved?

Consider the number and frequency of any previous tube replacements or x-rays undertaken to confirm tube placement.

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