Standard Operating Procedures

Nasogastric Tube Insertion in Children and Young People and Initial Placement Checks

March 2024

Family Nursing & Home Care

Document Profile

Type	Standard Operating Procedures
Title	Nasogastric Tube Insertion in Children and Young People and Initial Placement Checks.
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Category	Clinical
Version	1
Approval Route	Organisational Governance Approval Group (OGAG)
Date approved	7th March 2024
Review date	3 years
Document Status	This is a controlled document. Whilst it may be printed, the electronic version posted on the intranet is the controlled copy. Any printed copies of this document are not controlled. As a controlled document, it should not be saved onto local or network drives but should always be accessed from the intranet.

Version Control

Date	Version	Summary of changes made
	1	New Standard Operating Procedures. Procedures moved into this template from the Nasogastric Tube Insertion in Children and Initial Placement Checks Policy. Document amended to reflect safety recommendations from Southampton Children's Hospital guidance on Nasogastric Tube Placement and care in Paediatrics alongside guidance in relation to the initial placement checks for nasogastric and orogastric tubes. The use of lubricating gel when passing a nasogastric tube has been removed in line with current best practice. Clarification made that gastric aspirate should be re-tested if between pH 5 and pH 6. Care plans updated.

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Introduction

A naso-gastric tube is a fine-bore tube, usually made of PVC, polyurethane or silicone, which is passed through the nose, down the oesophagus and into the stomach and is used to deliver medicines, fluids or specially formulated feeds.

In recent years, several patient safety alerts have highlighted a need to adopt a significant change in the practice of nasogastric tube feeding, with particular importance being placed on how positioning of the tube is confirmed. (National Patient Safety Alert 2005, NHS Improvement, 2016)

This SOP has been developed to support evidence-based practice for the insertion of nasogastric tubes in children and young people (0-18 years) and placement checks.

The follow definitions are used within these standard operating procedures:

- **Children** – includes young people aged 0 to 18 years of age
- **Infant** – a child under one year of age
- **Neonate** – a newborn baby under the age of 28 days
- **Turbulent Flush Technique** – describes a push-pause method of flushing

SOP 1 Nasogastric Tube Insertion Procedure

Purpose

To ensure the procedure is carried out safely following the Southampton Children's Hospital (SGH) guidance for Nasogastric Tube Placement and Care in Paediatrics.

Scope

This SOP is for all Family Nursing & Home Care staff trained and competent in the insertion of nasogastric tubes in children and young people. It covers the insertion of the tube only but not the initial placement check (see SOP 2), which **must** be undertaken before the tube is used.

Core Requirements/Procedure

Ensure all equipment is available.

- Care plans (available as EMIS templates), patient/parent information leaflet and recording documents (Appendices 3,4,5,6,7)
- Correct size nasogastric tube
- Non sterile gloves (1 pair) and apron
- 50 ml purple syringe to withdraw aspirate from stomach
- pH indicator strips – check CE marked and intended by the manufacturer to test human gastric aspirate, in date and stored following manufacturer's recommendations.
- Tape to secure the tube
- Vomit bowl
- Tissues
- Alcohol gel hand rub
- Child's dummy or drink if appropriate
- Water to lubricate the tube
- Water to flush tube (**only after correct placement has been confirmed**)

Explain and discuss procedure with child/young person and family to ensure the child (where appropriate) and family have full understanding of procedure and to aid compliance.

Give the family the contact number for Children's Community Nursing Team (443623) in case they require advice and support (9-5 Mon-Fri). Outside of these times, advise to contact Robin Ward on 442122.

Make sure the child is comfortable and in the most appropriate position. Infants can be wrapped in a blanket/towel to keep them secure or an adult can hold the infant. An older child may be able to sit upright with support to their back and head.

Follow Southampton Children's Hospital guidance Nasogastric Tube Placement and Care in Paediatrics- Volume 7.

Perform hand hygiene in accordance with hand hygiene policy.

Put on gloves and apron

Check the tube is intact. The tube should be stretched to remove any shape retained from being packed. If the tube has a guide wire, make sure it is correctly inserted in the tube and is not bent. If not being used – remove guidewire.

Determine length of tube to be inserted for:

- Older children over 1 year of age (NEX) – measure tip of tube from tip of the **N**ose to tragus of the **E**ar and then down to the **X**iphisternum. (Appendix 1)
- neonates and infants (NEMU) – Measure from the tip of the **N**ose to the tragus of the **E**ar and then down to the **M**idpoint between the xiphisternum and **U**mbilicus (Appendix 1)

Note mark on tube or keep fingers on the point.

Lubricate tip of tube using warm water to enable it to be inserted easily and the tube to be easily slipped into the nostril.

Insert tip of tube into nostril and slide tube backwards along the floor of the nose.

If there is an obstruction, check for coiling. To ensure minimal trauma to nostril, pull back tube, turn it slightly and advance again.

As the tube passes through the nose encourage the child/young person to drink or swallow (if appropriate) offer an infant a dummy if they usually have one.

If child or infant unable to swallow just continue to advance tube until you have reached the point at which the tube was measured (NEX or NEMU measurement as appropriate).

To reduce risk of tube becoming dislodged, secure tube with recommended tape or one that will not irritate child's skin and if used remove the guide wire.

Proceed to SOP 2 to confirm initial placement.

When safe to do so, flush the tube with 10mls of sterile water. Consideration of fluid volume to be taken into account for neonates and patients on fluid restriction. It is now safe to use the tube for the administration of feed and medication. The guidewire should be cleaned, dried and placed in a sealed container for re-use.

Remove personal protective equipment and dispose of all waste.

Perform hand hygiene.

Recording – Record in the child/young person's care records the size and type of tube that has been used. Also record the length of tube inserted (Appendix 6) and record that correct placement has been confirmed (Appendix 7)

Emergency Procedures – If child starts coughing or their colour changes, stop procedure and remove the tube and ensure child is settled then contact qualified nurse or call Robin Ward for advice.

If child not breathing, commence basic life support as per protocol and dial 999.

Dial 999 for an ambulance:

- If the child stops breathing
- If the child's skin colour becomes blue/pale
- If the child's usual respiratory rate is increased or decreased
- If the child becomes agitated and becomes hot and sweaty.

SOP 2 Confirming Initial Placement

Purpose

To ensure the correct procedure is followed to confirm initial placement of the nasogastric tube.

Scope

This SOP details how to confirm the **initial** placement of the newly inserted nasogastric tube. N.B. there is a separate SOP for tube checks prior to feeding or medication administration (SOP 3).

Core Requirements/Procedure

Test aspirate – using a 50ml purple syringe, obtain 0.5ml – 1ml of aspirate from the nasogastric tube using gentle suction.

Check what medication the child/young person is on that might affect the pH of the aspirate.

Test the aspirate on CE marked indicator paper for use on human gastric aspirate as per manufacturer's guidance.

Follow the flow chart in appendix 2.

Should aspirate not be obtained, see SOP 4 for further guidance. Where it has not been possible to obtain gastric aspirate, remove the tube and re-insert. If still no aspirate after this and all of the steps in SOP 4, the child or young person must attend Accident and Emergency for an X-Ray to confirm correct placement of the nasogastric tube prior to the tube being used.

SOP 3 Nasogastric Tube Placement Checks

(prior to feeding, medication administration, vomiting, coughing etc)

Purpose

To ensure that the nasogastric tube remains in the correct position.

Scope

This SOP details how to check that the nasogastric tube remains correctly placed prior to use or following episodes of vomiting, coughing etc. NB there is a different procedure (SOP 2) for the initial placement check following insertion of the tube.

Core Requirements/Procedure

Check whether the patient is on medication that may decrease the pH level of gastric contents:

- antacids,
- H_2 antagonists
- proton pump inhibitors.

For those patients who are regularly on antacids, the initial risk assessment needs to identify actions that staff should take in this scenario and document them in the care plan. The initial pH of the aspirate should also be documented in the EMIS care record.

Check for signs of tube displacement. Documenting the external length of the tube initially and checking external markings prior to feeding will help to determine if the tube has moved. The documentation will also assist radiographers if an x-ray is needed.

Obtain sufficient aspirate (0.5 – 1 ml) from the nasogastric tube. 0.5 – 1 ml of aspirate will cover an adequate area on the single, double or triple reagent panels of pH testing strips/paper. Allow ten seconds for any colour change to occur (or as per manufacturer's instructions). N.B pH test strips must be intended by the manufacturer to test human gastric aspirate as some papers are designed specifically for laboratory testing (NHS Improvement 2016)

- **If the aspirate is pH 1 – 5 range – Commence feed (N.B see below if pH between 5 and 6).** There are no known reports of pulmonary aspirates at or below this figure. The range of pH 1 – 5 balances the risk between increasing the potential problems for clinical staff e.g. removing tubes that are actually in the stomach, increased use of x-ray with the, as yet, unreported possibility of feeding at pH 5.5 when the tube is in the respiratory tract.
- **If the aspirate is between pH 5 and 6 - re-test.**
- **If the aspirate is pH 6 or above – DO NOT FEED.** Possible bronchial secretion if the aspirate is pH 6 or above. The initial risk assessment should identify actions

for staff to take in this scenario for each patient. The actions should be documented in the care plan and/or in local policies.

Wait up to one hour before re-aspirating to check pH level. The most likely reason for failure to obtain gastric aspirate below pH of 5 is the dilution of gastric acid by enteral feed. Waiting up to an hour will allow time for the stomach to empty and the pH to fall. The time interval will depend on the clinical need of the patient and whether or not they are on continuous of bolus feeds:

- for continuous feeds, stop the feed and test again in 15-30 minutes time
- for bolus feeds, wait and test again in 15-30 minutes time
- Do not commence feed if pH remains above 5. Seek advice from a senior nursing colleague or Robin Ward if unsure that the nasogastric tube is safe to use.

SOP 4 Problems Obtaining Aspirate During Nasogastric Tube Placement Checks.

Purpose

From time to time, there may be problems obtaining aspirate. This SOP should be used when this scenario occurs.

Scope

This SOP is for staff having problems obtaining aspirate during nasogastric tube placement checks. It details various measures to undertake to help resolve this issue.

Core Requirements/Procedure

Ensure the nasogastric tube has been inserted to the documented length

Turn patient onto their left hand side. This will allow the tip of the naso-gastric tube to enter the gastric fluid pool.

Inject Air. Using a 50ml syringe insert 5ml of air into the Nasogastric tube to try and move the tip away from the stomach wall.

This is **NOT** a testing procedure: **DO NOT** carry out auscultation of air ('whoosh' test) to test tube position.

Injecting air through the tube will dispel any residual fluid (feed, water or medicine) and may also dislodge the exit-port of the naso-gastric feeding tube from the gastric mucosa. Using a large syringe allows gentle pressure and suction; smaller syringes may produce too much pressure and split the tube (check manufacturers guidelines)

Advance the tube by 1-2 cm for infants and children. Advancing the tube may allow it to pass into the stomach if it is in the oesophagus, like wise it can be retracted by 1-2cm from the NEX measurements.

Consider X-Ray (all radiographs should be read by appropriately trained staff). X-Ray should not be used routinely. The Radiographer will need to know what has already been tried to obtain aspirate, what the problem has been and the reason for the request. Fully radio-opaque tubes with markings to enable measurement, identification and documentation of their external length should be used.

Additional Tip. If the patient is alert, has intact swallow and is perhaps only on supplementary feeding and is thus eating and drinking during the day, ask them to sip a coloured drink and aspirate the tube. If you get the coloured fluid back then you know the tube is in the stomach.

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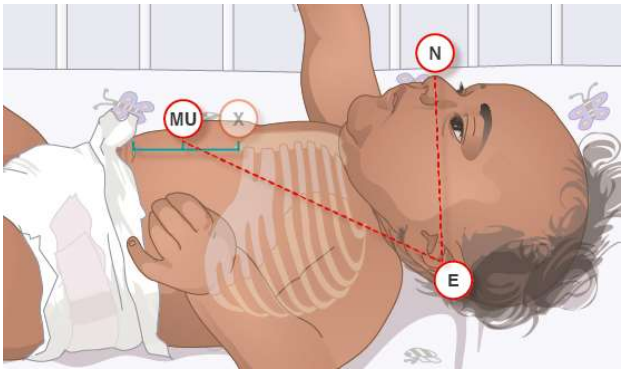
Appendices

APPENDIX 1 - Measuring the Length of a Nasogastric Tube to be Passed

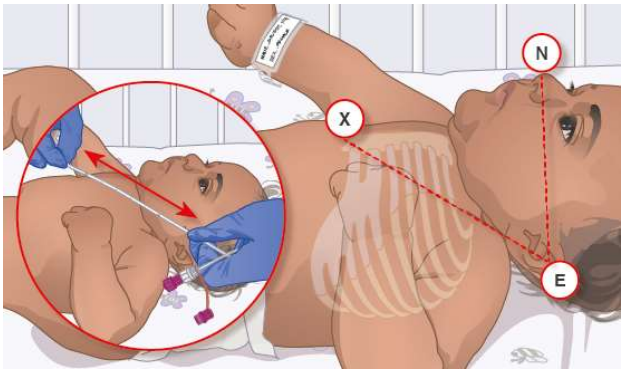
In Infants under 1 year of age (NEMU)

Your measurement should be from the tip of the **N**ose to the tragus of the **E**ar and then down to the **M**idpoint between Xiphisternum and **U**mbilicus.

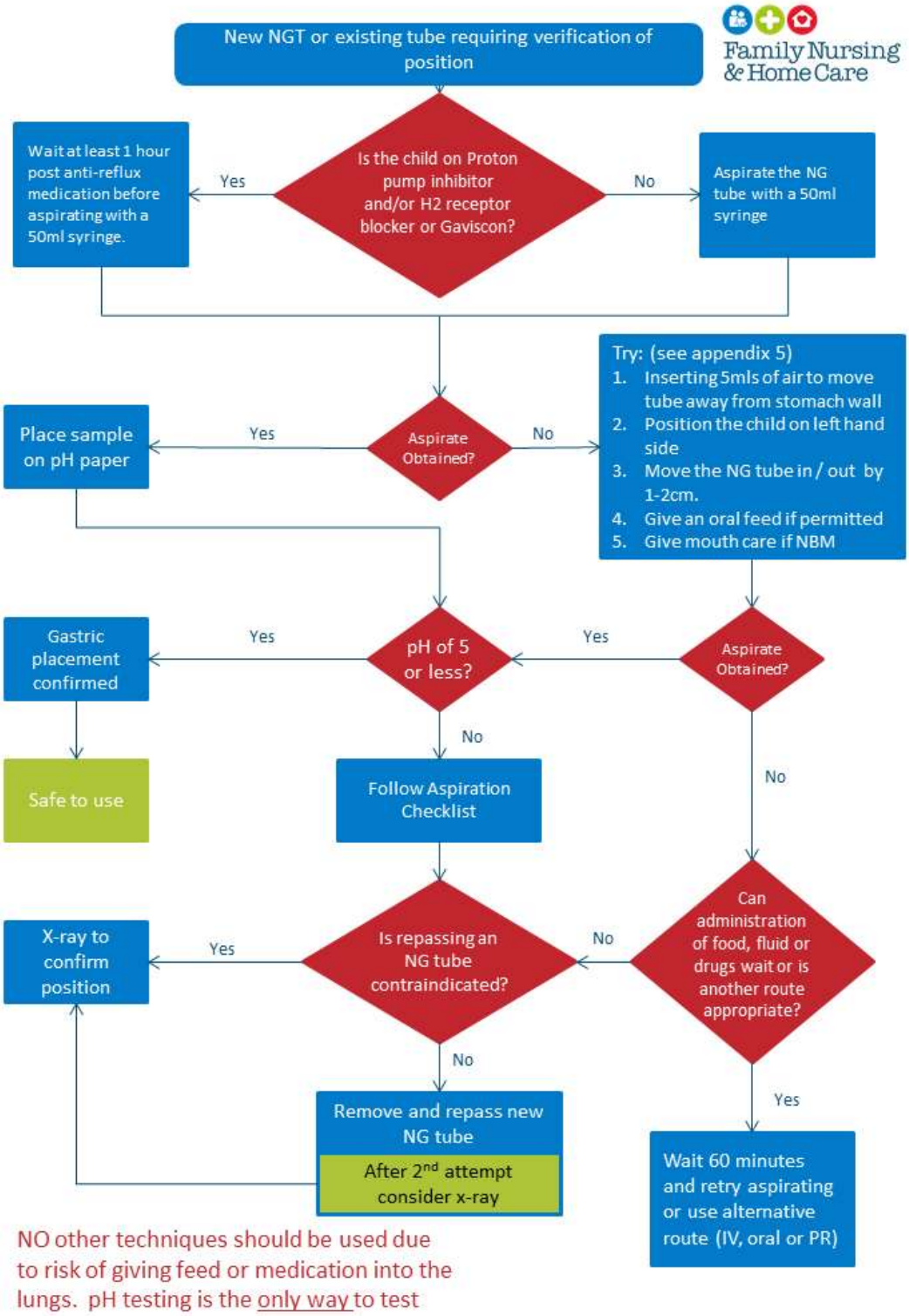


In older children over 1 year of age

Your NEX measurement should be from the tip of the **N**ose, to the tragus of the **E**ar and then down to **X**iphisternum.



APPENDIX 2 – Decision Tree



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APPENDIX 3 – Care Plan for Nasogastric Tube Insertion

(NB now a template on EMIS)

Name:.....

D.O.B:.....

URN/EMIS No:.....

Aim of identified care need:
..... has feeds via a naso-gastric tube and may need tube replacement. This care plan details how to change the nasogastric tube safely.
Plan of Care
Check the 'Nasogastric Tube Insertion Record' for details of the tube including size and length **Procedure for passing the tube:** • Ensure all appropriate equipment is readily available • Discuss and explain procedure to child • Ensure child is in a comfortable position • Wash hands or apply alcohol gel hand rub and allow to dry for 30 seconds • Put on non-sterile gloves and apron • Determine length of tube ("NEX or NEMU measurement") • Note mark on tube or keep fingers on the point measured and document external length • Ensure guidewire is in place as appropriate – do not pre-lubricate the guidewire • Lubricate tip of tube using water • Insert tip of tube into nostril and slide backwards along the floor of the nose • If there is an obstruction pull back tube, turn it slightly and advance again • As the tube passes through the nose encourage the child to drink or swallow (if appropriate) • Offer an infant a dummy if they usually have one • If child/infant is unable to swallow just continue to advance tube until you have reached the point at which the tube was measured • Secure tube with recommended tape or one which will not irritate the child's skin

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- Dispose of equipment
- Remove the guidewire if used, wash, dry and store in sealed container for re-use
- Wash and dry hands
- Document tube change on the 'Nasogastric Tube Insertion Record'

If you have any concerns or difficulty passing the tube – contact a senior nursing colleague

- **If child starts to cough or they have a colour change, remove the tube – stop procedure – contact a senior nursing colleague or Robin Ward for advice**
- **DIAL 999**
  - **If child stops breathing**
  - **If child becomes blue/pale**
  - **If the child's usual respiratory rate is increased or decreased**
  - **If child becomes agitated and becomes hot and sweaty**

Correct initial placement must now be confirmed (see relevant care plan) Nasogastric tubes are not flushed, nor are guidewires pre-lubricated, nor is anything introduced through the tube until initial placement has been confirmed

Signature of Nurse: ..... Signature of Parent: .....

Date: …… Review Date: ……

Signatures indicate that the care has been negotiated

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APPENDIX 4 – Care Plan for Nasogastric Tube Placement Checks

Name:.....

D.O.B:.....

Aim of identified care need:

..... has feeds via a naso-gastric tube. This aim of this care plan is to confirm the correct position of the nasogastric tube in accordance with current best practice to ensure feed goes directly to the child's stomach and not into their lungs.

Plan of Care

Check the 'Nasogastric Tube Insertion Record' for details of the external tube length and normal pH range.

How to check the nasogastric tube position:

- Gather all required equipment (50 ml purple syringe, pH strip)
- Wash and dry hands
- Family Nursing & Home Care staff to wear apron and gloves
- Explain to child what you are going to do.
- Check for signs of displacement including measuring external tube length.
- Reposition or re-pass tube if required
- Remove the cap or spigot from the nasogastric tube
- Attach a 50 ml purple syringe to the end of the tube and aspirate (by gently pulling back plunger of syringe) 0.5ml – 1 ml of stomach contents
- Take a pH strip and place a few drops of aspirate onto it. Wait appropriate time before reading result.
- Match the colour change of the pH strip with the pH colour code to identify the pH of the stomach contents
- pH 1 – pH 5 indicates an acid reaction, which is reliable confirmation that the tube is not in the lung (NPSA, 2016).
- pH 5 – pH 6 re-test – seek advice from a senior nursing colleague or Robin Ward if pH remains at this level
- Ensure pH level is within child's usual levels
- Proceed to feed when safe
- Remember to keep pH strips clean and dry in a sealed container.
- If you are unsure, contact a senior nursing colleague or contact Robin ward for advice
- Discard all waste
- Wash and dry hands

What to do if you have a pH of above 5.

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If child has just had a feed or is on continuous feeds, the milk in the stomach can increase the pH of stomach contents.

- If child is on medicines which reduce the acid in the stomach, such as: Ranitidine, Omeprazole, Gaviscon, Sodium Bicarbonate, you may get a reading higher than pH 5. Discuss this with a senior nursing colleague or paediatrician to find out if this is normal for the child.
- For continuous feeds, stop the feed and test again in 15-30 minutes time.
- For bolus feeds, wait and test again in 15-30 minutes time.
- Do not commence feed if pH remains above 5.
- Contact a senior nursing colleague or Robin Ward for advice.

If it is not possible to obtain fluid for checking pH:

- Check external length is correct
- If possible turn child on to left hand side
- Try aspirating again
- If no aspirate **do not feed**
- Advance or retract (gently push) tube by 1-2 cm
- Try aspirating again
- If aspirate obtained is between pH1 and 5 proceed to feed
- If no aspirate, **do not feed**, contact a senior nursing colleague or Robin ward for advice.

Signature of Nurse: ..... Signature of Parent: .....

Date: ……. Review Date: ……...

Signatures indicate that the care has been negotiated

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APPENDIX 5 – Parent/Patient Information – Nasogastric Tubes

See separate document found in central filing

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APPENDIX 6 – Nasogastric Tube Insertion Record

Name: .....

D.O.B: .....

URN/EMIS No: .....

Or Affix Patient Label

*This document should be completed for all patients requiring nasogastric tube placement, on **initial insertion** and on **all subsequent insertions**. N.B The 'Nasogastric Tube Position Confirmation Record' should be used for all other placement checks e.g. prior to feeding, giving medication etc*

Date & Time of Insertion / Reinsertion	Tube Type	Size	NEX Measurement	External Length (once secure)	Nostril Used (left or right)	Aspirate Obtained (yes/no)	pH of Aspirate (if obtained)	X-Ray Required (yes/no)	Inserted By

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APPENDIX 7 – Nasogastric Tube Position Confirmation Record

Name: .....

D.O.B: .....

URN/EMIS No: .....

Or Affix Patient Label

Child's normal pH range:

If unable to confirm that the tube is in the stomach despite following the recommended procedures, remove and reinsert. This should be documented in the 'Nasogastric Tube Insertion Record'

Date	Time	Aspirate Obtained Yes/no	pH of Aspirate	External Tube Length	Checked by

If any new or unexplained respiratory symptoms occur, stop feed and summon help immediately.

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APPENDIX 8- Southampton Children's Hospital- Nasogastric Tube Placement and Care in Paediatrics- Volume 7.

Please find document in central filing