East of England Neonatal ODN
(Hosted by Cambridge University Hospitals)

Clinical Guideline: Gastric tube feeding Guideline for Staff on Neonatal units

Author: East of England Benchmarking group
For use in: EoE Neonatal Units
Guidance specific to the care of neonatal patients.

Used by:

Key Words:

Date of Ratification: March 2025

Review due: March 2028

Registration No: NEO-ODN-2025-2

Approved by:

Neonatal Clinical Oversight Group	
Clinical Lead Sajeev Job	S Job

Ratified by ODN Board:

Date of meeting	**March 2025**

Audit Standards:

- There is an evidence-based guideline to support clinical practice
- Care of gastric tubes including documentation
- Staff Education
- Parental/Carer education and involvement

Audit points

Audit will be through annual benchmarking activity and consequent action planning using infant's records to assess quality outcomes and guideline adherence. Poor scores may necessitate more frequent audits to ensure progress is being made.

Purpose:

To provide guidance on insertion, testing and feeding of infants on neonatal units and ensure patient safety for all infants fed with gastric tubes, either via the nasogastric or orogastric insertion method.

Target Population:

Nurses, nursery nurse, health care assistants and medical staff; students, under direct supervision of a competent person, undertaking practice placements caring for infants on neonatal units.

Background:

Historically incidents have been recorded relating to the use of misplaced nasogastric tubes[1] and inappropriate use of medical equipment[2]. Even after alerts were sent out to highlight these issues, incidents still occurred in significant numbers to necessitate a further alert,[6,7] to highlight the dangers surrounding the use of enteral tubes.

Recommendations were also given relating to training of staff and the safe use of gastric tubes[7]. Implementing a guideline to be used throughout the network ensures care practices are standardised and monitored for compliance to best practice throughout the region.

Introduction:

Within the neonatal environment passing & using gastric tubes is an integral part of care and daily routine for many of the babies. It provides a vital method of delivering nutrients to the infant, with minimal energy expenditure, thus supporting growth and development. It is a blind procedure, meaning that we cannot visually confirm the exact placement of the tube when in use. Therefore, the need to follow a clinical procedure (Appendix 1) to confirm the position of the tube on insertion or prior to use, is essential to minimise the risk of using a misplaced gastric tube. Documentation of competency to perform this vital skill for staff is necessary for units to be able to evidence adherence to quality and safety through auditing/ benchmarking processes.

Objectives

- To provide guidance on insertion of gastric tubes
- To provide guidance on how to test gastric tubes for correct tube position

- To provide guidance on the administration of gastric feeds and medicines
- To provide guidance on how to vent air from the stomach for patients that;
    I. have had bag and mask ventilation
    II. are on nasal CPAP
    III. have abdominal distension

Contraindications

There is an increased risk of causing trauma or misplacing a gastric tube in patients who have the following contraindications. The competent practitioner passing the tube should determine the safest method of placement. If there is any doubt, this should be highlighted to the nurse in charge or medical team for clarification.

- anatomical deformity
- trauma
- recent oral, nasal or oesophageal surgery (caution should be used if enteral tube is dislodged)

Exclusion of congenital anomalies [8]

The inability to pass a nasogastric tube beyond the nares is indicative of choanal atresia and is a medical emergency and should be escalated to a senior paediatrician.
Resistance to passage of a gastric tube beyond the oropharynx is indicative of oesophageal atresia.
A gastric tube should be inserted prior to chest or abdominal x-ray to facilitate differential diagnosis.

Equipment

- radio opaque NG tube with externally visible length markings
- an enteral safe [1, 10] syringe 5mls[10] for aspiration depending on the size of the infant.
- pH Indicator strips CE marked reflecting 0.5 increments
- hydrocolloid skin protection and adhesive to secure the tube
- gloves
- oxygen, bag and mask and suction should be checked, working and accessible throughout the procedure

Determining length of the tube

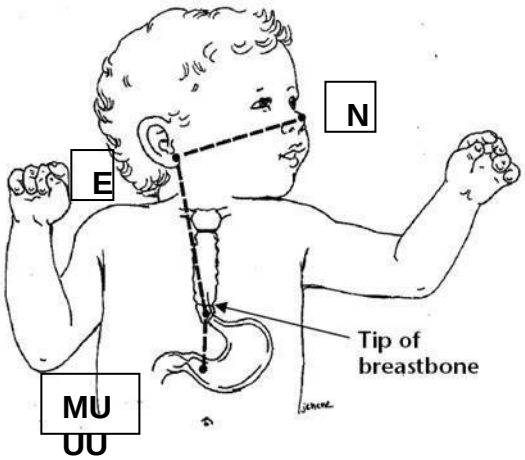
There are a range of different sized gastric tubes available on the NNU. The table below provides a weight-based guide to gastric tube size selection and should be

used alongside clinical assessment to aide decision making. Babies who are either less than 500grams or less than 26 weeks should have a size 4 gastric tube due to their physical size or the fragility of their tissues. If a baby has a surgical concern, they should have their gastric tube upsized to the next sized tube available. It is worth considering that if this upsized gastric tube is placed nasally this may be too big and cause obstruction or trauma so you may need to switch to the oral route[9].

Weight (grams)	**Gastric Tube Size (fr)**	**Surgical Babies**
<500 OR <26 weeks	4	5
500-1500	5	6
>1500	6	8

The following technique should be used to determine the length of gastric tube placement[3].

Measure the length of the gastric tube using NEMU (Nose, Ear, and Mid-Umbilicus)



If passing a nasogastric tube: Measure from the tip of the infants' nose to the earlobe and from the earlobe to the point midway between the xiphoid process (tip of breast bone) and umbilicus

If passing an orogastric tube: Measure from the midline of the infants' mouth to the earlobe and from the earlobe to the point midway between the xiphoid process (tip of breast bone) and umbilicus
Make a note of the length to be inserted.

Parental/carer inclusion

1. The procedure should be explained and rationalised for parents/carers, as partners in care, to try to alleviate stress and anxiety. Parents/carers are encouraged to be involved in the care decisions of their babies.
2. Healthcare professionals should not discourage parents frombeing present during the procedure. This ensures the families are involved in as much of their baby's care as possible, facilitating family centred care. Secondly, parental presence can minimise pain/discomfort for the infant through delivery of comfort holding, voice and positive touch etc.
3. Local practice should be inclusive of parental/carer teaching of naso/oro-gastric tube feeding, supported by a comprehensive competency as evidence. It is noted that under the FICare model parents are encouraged to be involved in all possible aspects of their infant's care, promoted through facilitation of partnership and collaboration between parents and the NICU staff and assured through teaching of skills required to care for their baby [13].

Procedure Guide

Action	Rationale
If possible, explain procedure to parents/carers and offer information leaflet prior to procedure. Ensure parents are up to date.	To ensure that parents are involved as partners in care for their babies through promoting information sharing between staff and parents
Document rationale for passing gastric tube in healthcare records. Date, time and sign including designation.	To ensure the needs of the patient requiring an enteral tube are greater than the risks of incorrect placement. Provides at glance evidence of placement and length of tube.
If a patient requires an x-ray, ensure the enteral tube is passed prior to the x-ray being taken	To avoid unnecessary x-ray exposure.

Ensure the infant, has not been fed for a minimum of 15-30 minutes prior to passing the gastric tube	To avoid the risk of vomiting and aspiration during procedure
Prepare the appropriate equipment and ensure oxygen and suction is checked and readily available	To avoid unnecessary interruptions to procedure and ensure the environment is safe to proceed
Wash and dry hands, non-sterile gloves should be worn if required by local Trust	To prevent cross infection as per local Infection Control Policies
Consider the baby's comfort during the procedure and select an appropriate care strategy to minimise discomfort. i.e., swaddling, sucrose, non-nutritive sucking.	To minimise stress and discomfort during the procedure.
Wherever possible, encourage parents to be present during the procedure.	To facilitate the involvement of families in the care of their babies as much as possible. As per pain management evidence, parental presence (comfort holding/speaking to baby etc) can minimise pain for the baby. We realise that gastric tube insertion isn't necessarily "painful" but it is certainly uncomfortable and so we would suggest that parent comfort during the procedure is beneficial. Parents find pain and discomfort the most distressing aspect of the NICU and also wish to actively participate in comforting their infant[13]. These approaches are consistent with modern family-centred care in neonatal units in which the best interests of the infant and family are put ahead of staff convenience.
Position baby in the supine position with head in neutral position.	Hyper extension of the neck can occlude the airway.
Check the tube is intact. The tube should be stretched to remove any shape retained from being packaged	Establish patency of tube

Select nostril that is clear, if replacing tube use alternative nostril from which the tube was originally placed-if appropriate.	To prevent long term irritation and skin damage
Determine the length of the tube to be inserted. **For Nasogastric tube placement**: (see above picture) Select a clear nostril, insert the tip of the tube into the nostril and slide backwards and downwards along the floor of the nose. Advance the tube steadily* to the predetermined length. **For Orogastric tube placement:** Insert the tip of the tube into the mouth and slide it backwards and inwards along the tongue to the oropharynx and advance steadily* to the predetermined length. *Insertion of tube should take around 15 seconds to minimise stimulation of vagal nerve. During OGT insertion there is an increased possibility of apnoea and bradycardia due to vagal stimulation[5].	To estimate accurate placement in the stomach following normal anatomical structures.
If at any time the baby shows signs of bradycardia, apnoea, vomiting or respiratory difficulties such as tachypnoea, increased work of breathing, or becomes cyanotic: stop the procedure immediately and remove the tube.	To prevent the deterioration of the infant
If there is any resistance/ obstruction on insertion, pull back, turn the tube slightly and advance again. If obstruction occurs again try the other nostril. If resistance is still felt, stop the procedure and seek senior help. Do not force the tube.	To avoid causing perforation of the oropharynx, pneumothorax or damage to delicate mucosa[1] Consider choanal atresia, tracheal oesophageal fistula / atresia if a tube has not been previously successfully passed.[8]
To assess tube position, aspirate 0.2 to 1ml stomach contents using a 2.5ml to 5ml syringe.[10] Check contents are gastric by using pH strips. The pH should be less	To ensure accurate placement of the tube prior to feeding The NPSA has highlighted the potential difficulty experienced by some staff in differentiating pH readings using

than 5.5[3] If pH range falls between 5 and 6, the tube position should be assessed with a second competent person.	currently available pH indicator strips between pH range of 5 and 6.
If pH is ≥6, it is not deemed safe to feed, without undertaking a full risk assessment with another competent nurse following the guidance in Appendix 2	A pH 6 and above. There are many factors in neonates that affect the results from pH indicator strips or paper including: • gestation; • postnatal age; • small volumes of aspirate; • medications that affect the gastric pH; Continuous and frequent feeding. Staff should consider the factors for each patient that may contribute to a high gastric pH (pH 6 or above) when risk assessing. Any decision made must ensure the safety of the patient using the best information available
When securing an orogastric tube, care should be taken not to damage the lips or gums or obstruct the use of the tongue.	This can occur if the tube is pulled too tightly when securing the tube.

Documentation of Procedure

Document gastric tube size and length on the appropriate documentation kept in either the health care records or the bedside nursing notes each time a new tube is passed.	To minimise risk, in accordance with the Professional Standards for Nurses and Midwives.[2] A reference measurement will provide a benchmark for the risk assessment of tube position and movement.
If the length of tube is advanced, retracted or repositioned, alterations should be clearly documented in the healthcare / nursing records	To ensure patient safety with correctly documented changes.
Every time a gastric tube is inserted, or on subsequent reinsertions, complete	To keep a documented record of all tube insertions and subsequent reinsertions. [1]

the local trust gastric placement checklist record.	
Manufacturers guidance should be followed to determine routine tube changes.	To avoid irritation to the baby's mucosal lining within the stomach

Free Drainage of Gastric Tube

If a child requires a gastric tube for abdominal distension due to paralytic ileus, gastrointestinal disease or following gut surgery, leave the tube on free drainage. Aspirate the tube as indicated and requested and check tube position. Large bore gastric tubes should be used for babies requiring gastric drainage.	To allow drainage of gastric contents and facilitate early gastric motility. To avoid aspiration of gastric contents.
If a child is on nasal Continuous Positive Airway Pressure (nCPAP) or has received bag valve mask ventilation, the gastric tube can be left on free drainage if NBM. The open end of the tube should be raised above the level of the stomach. If not on free drainage, aspirate stomach contents 4-6hrly and check tube position. In units that practice continuous venting following administration of feeds: this can be facilitated by securing the end of the tube above the head of the infant, with an enteral syringe attached to create a reservoir should gastric contents reflux. 11 Documentation should be kept up to date including the aspirate	To prevent accumulation of air in the stomach. To avoid aspiration of gastric contents.

The following methods should NOT be used to confirm feeding tube placement

Absence of respiratory distress	Small bore tubes can enter the respiratory tract with few, if any, symptoms, and large bore tubes can enter a patient's respiratory tract without any symptoms being shown, particularly if the patient is unconscious.
Appearance of feeding tube aspirate	Research and anecdotal evidence indicate that relying on the appearance of feeding tube aspirate is unreliable as a primary testing method as gastric contents can look similar to respiratory secretions
Radiography - should NOT be used routinely but should be used if the baby is being x-rayed for another reason. However, if all other attempts to confirm tube position fail, then X-ray should be undertaken. Tubes with markings should be used for all babies to enable accurate measurement of depth and length and the position of the tube documented. All tubes used should be radio-opaque.	Routine radiography for feeding tube placement would result in excessive and unnecessary exposure to radiation, loss of feeding time, increased handling of the baby, and would not be cost effective.
Observe the infant until the feed is complete.	To be present to take prompt action to ensure no adverse event occurs during the feed or minimise the effects of a tube becoming dislodged by responding promptly.

Securing and skin care

- Once the gastric tube is deemed as safe to use, secure the tube with the appropriate tape. Maintaining the skin integrity is essential as damage to the skin can occur. The more preterm the baby the more damage that can be inflicted on the superficial cell layer as it is torn away when the tape is later removed.
- Use hydrocolloid dressing (extra thin) on the skin; then secure the feeding tube to the hydrocolloid dressing with adhesive tape Adhesive tape should not be

shared amongst patients to comply with local infection control guidance. Reassess the baby's condition and make the baby comfortable.

- If using a non-adhesive remover to remove tape, ensure manufacturer's instructions are followed and product is suitable to be used on the face.
- When the tape is removed, clean area with water and dry thoroughly.

When to check the tube position

- Following initial insertion;
- Before administering each feed;
- Before giving oral medication (please check with your local pharmacist that that the medication is a suitable formulation to be administered via gastric tube);
- Following vomiting, retching or coughing;
- If there is evidence of displacement. For example, if the tape is loose or the tube appears longer or kinked;
- If the baby is on continuous feeds, tube checking should be synchronised with syringe changes. When continuous feeding has stopped, wait 15 – 30 minutes to allow the stomach to empty and the pH level to fall.

Complications

- Vagal stimulation – bradycardias and apnoea's 5
- Increased work of breathing
- Aspiration, perforation of the oesophagus, posterior pharynx, stomach, duodenum;
- Small bowel perforation;
- Necrotising enterocolitis

Monitoring and Audit

Audited annually, in line with the East of England Benchmarking standards

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APPENDIX ONE

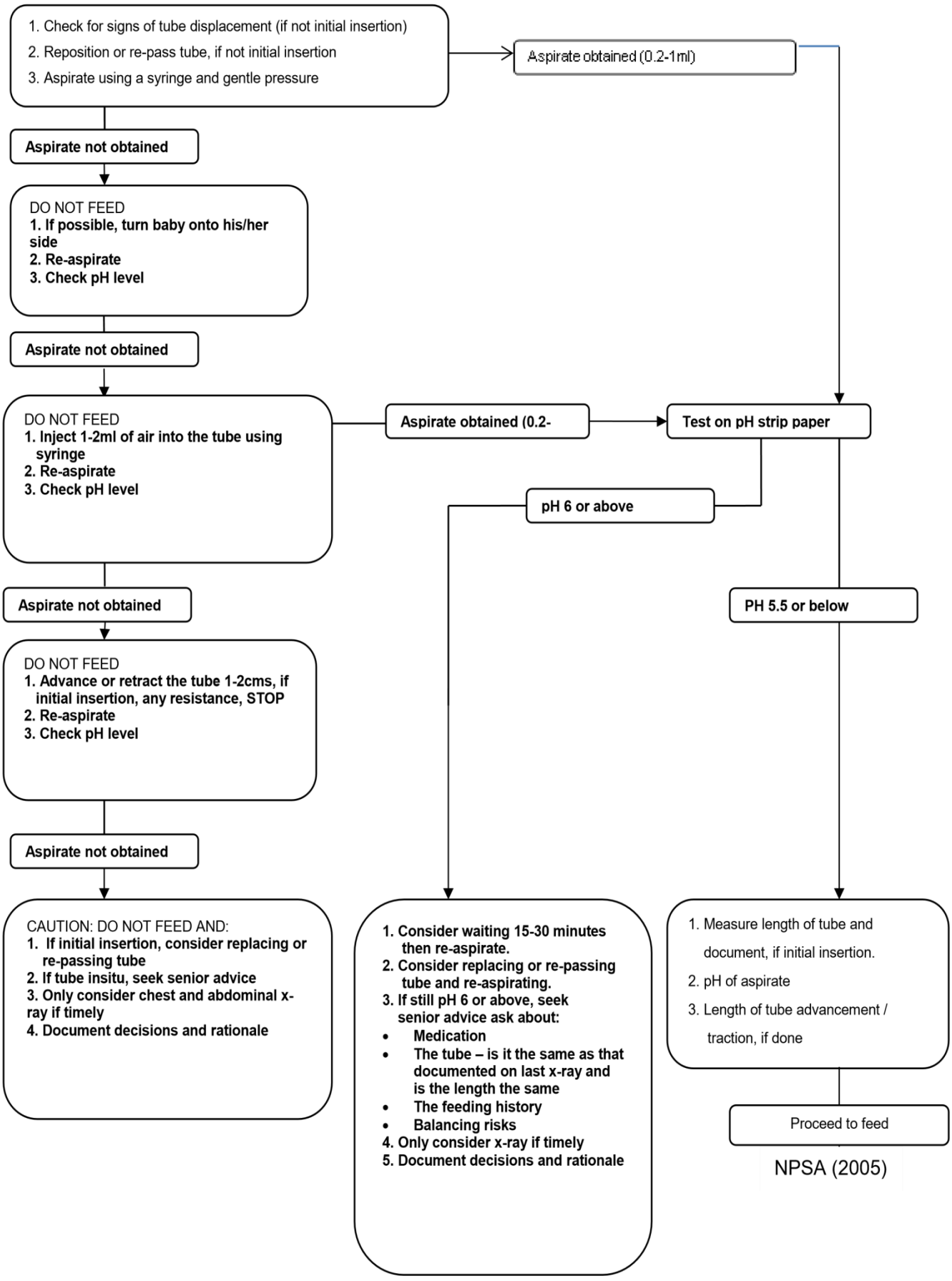
The recommended procedure for checking the position of the naso and orogastric feeding tube in babies under the care of neonatal units Use this flow chart as a basis for decision making:

Action	Rationale
Check for signs of tube displacement (if not initial insertion)	The tube may have coiled up in the mouth or if there is more tube visible than previously documented, the tube may have kinked. Loose tape may indicate movement. If tube has been displaced, it will need repositioning or re-passing before feeding.
Aspirate 0.2-1ml gastric fluid and allow ten to fifteen seconds for any colour change	0.2 to 1ml of aspirate will cover an adequate on single, double or triple reagent panels of pH testing strips or paper.
Aspirate using an enteral syringe	It is safe practice to use gastric tubes and enteral syringes that have non luer lock connectors (Building a Safer NHS for Patients: Improving Medication Safety published 22/01/2004 available at www.dh.gov.uk)
Aspirate is pH 5.5 or below PROCEED TO FEED	Aspirates testing pH 5.5 and below should indicate correct placement in most babies (including the majority of those receiving acid suppressants) and rule out the possibility of respiratory tract placement. Always match the pH indicator strip or paper colour change with the colour code chart on the booklet or box. If there is ANY doubt about the position and/or clarity of the colour change on the pH indicator strip or paper, particularly between pH5 or 6, DO NOT commence feeding.
Aspirate is pH6 or above CAUTION – STOP FEED: If clinically safe, consider waiting 15-30 minutes before aspirating again. Consider replacing and/or re-passing the tube and re-aspirating If still pH 6 or above, seek advice IT IS IMPORTANT THAT STAFF FOLLOW THE FLOWCHART, RECORD THE	The most likely reason for failure to obtain gastric aspirate pH 5.5 or below is the dilution of gastric acid by enteral feed. Waiting gives time for the stomach to empty and the pH value to fall. If pH is still 6 and above after waiting and replacing or re-passing the tube, seek advice and consider the following questions: • Is the baby on medication? • Is the baby only 24 t0 48 hours old?

OUTCOMES AND MAKE DECISIONS BASED ON THIS INFORMATION	• Is the tube in the same position as previously documented on an x-ray? • Is the visible length of the tube the same as previously documented? • What is the trend in pH values? • What is the volume of aspirate? It is important that actions and their rationale are documented. Clinical staff should balance the risks of not feeding a baby in the short term with feeding when there is the possibility of the tube being in the lungs. Only consider x-ray if timely e.g. if the baby is due for an x-ray for other reasons, and/or it is clinically safe to do so. If an x-ray is done, the radiographer should know this advice has been followed and the reason for the request should be documented.
Document all information	Documenting helps the clinical decision-making process. The tube size and length should be recorded each time the tube is passed. A record should also be made each time measurements of the pH level of the aspirate and the length of the tube's advancement or retraction are done.
Problems obtaining aspirate: suggest using larger size tubes with multiple ports. Turn baby onto his/her side	This may facilitate the tip of the nasogastric tube entering the gastric fluid pool.
Inject 1-2ml of air using a syringe	Injecting air through the tube may dislodge the exit port of the feeding tube from the gastric mucosa. Care must be taken when using large syringes on neonates to ensure that the correct amount of air is inserted, i.e. no more than 2ml.
Advance or retract the tube 1-2cm Stop if there is any resistance or obstruction	If the tube is in the oesophagus, advancing it may allow it to pass into the stomach. If the tube has been inserted too far, it may be in the duodenum. Consider withdrawing a few centimetres and re-aspirating. The position of the tube at the nose should already have been recorded and marked, if the tube is in situ. If the mark has not moved then advancing or retracting may not make a difference. Document the length of tube if moved.

If you still cannot obtain aspirate	If this is an initial insertion then consider replacing or re-passing the tube. If the tube has been in situ already, seek advice. Consider whether the length of the tube has changed and discuss options as outlined under the action point on aspirate of pH 6 and above. Record all decision and their rationale.

APPENDIX 2


1. Check for signs of tube displacement (if not initial insertion)
2. Reposition or re-pass tube, if not initial insertion
3. Aspirate using a syringe and gentle pressure
Aspirate obtained (0.2-1ml)
Aspirate not obtained
DO NOT FEED
1. If possible, turn baby onto his/her side
2. Re-aspirate
3. Check pH level
Aspirate not obtained
DO NOT FEED
1. Inject 1-2ml of air into the tube using syringe
2. Re-aspirate
3. Check pH level
Aspirate obtained (0.2-
Test on pH strip paper
pH 6 or above
Aspirate not obtained
PH 5.5 or below
DO NOT FEED
1. Advance or retract the tube 1-2cms, if initial insertion, any resistance, STOP
2. Re-aspirate
3. Check pH level
Aspirate not obtained
CAUTION: DO NOT FEED AND:
1. If initial insertion, consider replacing or re-passing tube
2. If tube insitu, seek senior advice
3. Only consider chest and abdominal x-ray if timely
4. Document decisions and rationale
1. Consider waiting 15-30 minutes then re-aspirate.
2. Consider replacing or re-passing tube and re-aspirating.
3. If still pH 6 or above, seek senior advice ask about:
• Medication
• The tube – is it the same as that documented on last x-ray and is the length the same
• The feeding history
• Balancing risks
4. Only consider x-ray if timely
5. Document decisions and rationale
1. Measure length of tube and document, if initial insertion.
2. pH of aspirate
3. Length of tube advancement / traction, if done
Proceed to feed
NPSA (2005)

Exceptional Circumstances Form

Form to be completed in the **exceptional** circumstances that the Trust is not able to follow ODN approved guidelines.

Details of person completing the form:	
Title:	Organisation:
First name:	Email contact address:
Surname:	Telephone contact number:
Title of document to be excepted from:	
Rationale why Trust is unable to adhere to the document:	
Signature of speciality Clinical Lead: Date:	Signature of Trust Nursing / Medical Director: Date:
Hard Copy Received by ODN (date and sign):	Date acknowledgement receipt sent out:

Please email form to: mandybaker6@nhs.net requesting receipt.

Send hard signed copy to: Mandy Baker
EOE ODN Executive Administrator

APPENDIX 1 – VERSION CONTROL SUMMARY

Document Title: Gastric tube feeding Guideline for Staff on Neonatal units

Version Number	Purpose / Changes	Author	Date Changed
1	New document	East of England neonatal Benchmarking group	26TH March 2018
2	Updated document	East of England Benchmarking Group	August 2021
3	Updated document	East of England benchmarking group	March 2025