Yorkshire and Humber Neonatal Operational Delivery Network Clinical Guideline

PAN

Jejunal Feeding

Author &/Or Working Group Name	**Jejunal Feeding Working Group**
Date Written/Reviewed	**March 2024**
Date Ratified	**March 2024**
Next Review due Date	**March 2029**

This clinical guideline has been developed to ensure appropriate evidence based standards of care throughout the Yorkshire and Humber Neonatal Operational Delivery Network. The appropriate use and interpretation of this guideline in providing clinical care remains the responsibility of the individual clinician. If there is any doubt discuss with a senior colleague.

Contents Page

Section	Topic	Page Number
A	**Guideline Summary**	3
1.	Aims	3
2.	Summary of Recommendations	3
3.	Areas Outside of Remit	3
B	**Full Guideline & Evidence**	**4**
1.	Background	4
2.	Evidence	5
3.	Insertion 1. Preparation 2. Procedure 3. Confirming position 4. Repeated attempts	5 5 6 9 9
4.	Ongoing management 1. Ongoing position checks 2. Suggested feeding regimes 3. Flushing and aspiration of the jejunal tube 4. Managing a blockage 5. Risks 6. Monitoring suspected displacement 7. Medications	10 10 10 11 11 11 13 13
	Transfer/repatriation with a jejunal tube	13
5.	References	14
8.	Appendices	14
9.	Version Control	21

A Guideline Summary

Aim

The aim of this guideline is to provide an evidence-based framework to support the management of neonates requiring Jejunal tube feeding in Neonatal Units within the Yorkshire and Humber Neonatal Operational Delivery Network.

Objectives

- The guideline will support staff to understand the correct procedure for bedside insertion of a jejunal tube including checking correct placement and ongoing management.
- The guideline gives all unit's access to an evidenced based guideline to support the repatriation of babies to their home unit.
- The guideline recommends areas develop local SOP's outlining the referral pathway for Jejunal tubes to be cited under direct radiological guidance if required.

This guideline does not detail the specific indications for jejunal feeding which are consultant led decisions made on an individualised basis.

Scope

This guideline will cover the practical aspects of Jejunal Tube feeding in neonates or infants >28 days and still an inpatient in a neonatal unit. It will not cover:

- Alternative jejunal feeding routes (e.g. Jejunostomy)
- Guidance for siting a Jejunal tube under radiological guidance
- It is not intended as a decision algorithm for when to start Jejunal feeds.
- Neonates requiring long term jejunal feeding after discharge into the community. These infants would require input from a Paediatrician, paediatric dietitian, speech and language therapist and community nursing teams.

Summary of recommendations

Jejunal tubes should not be placed in the fridge or freezer prior to insertion as this may increase the risk of intestinal perforation.

Jejunal tube position must be confirmed on X-ray after insertion and before the tube is used. The jejunal tube must be seen to pass across the vertebral column left to right and then pass back across the vertebral column right to left.

The external length of the tube must be measured and documented every time prior to accessing the tube.

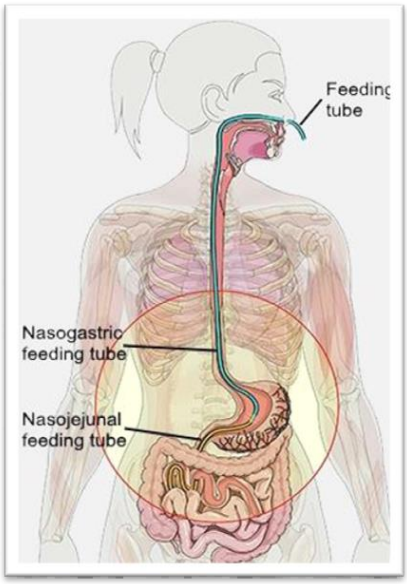
Do **NOT** give bolus feeds via a jejunal feeding tube. The jejunum is a narrow tube and bolus feeds would cause abdominal pain and diarrhoea (dumping syndrome) therefore feeds must be continuous when using this method.

When accessing an NJ/OJ there is an increased risk of infection due to it bypassing the stomach acid and its antimicrobial defence, so it is important to use an aseptic technique.

B Full Guideline & Evidence

Background

A Jejunal tube (JT) is a method of feeding directly into the small bowel (jejunum). The tube is normally passed nasally but can also be passed orally in certain situations. The tube passes through the nose (or mouth), oesophagus, stomach, pylorus, duodenum and into the jejunum. This type of feeding is also known as post pyloric, trans-pyloric and trans-gastric feeding Unlike the stomach, the small bowel has no storage capacity therefore feeds must be continuous when using this method.



(Picture used with permission from Leeds Teaching Hospitals)

Indications

- GORD that has not responded to conservative management and standard medications.
- Infants with increased risk of feed aspiration (either structural or neurological)
- Any surgery and gastric abnormality that contraindicates gastric feeding.

Contraindications

- Nonfunctioning gastrointestinal tract, ileus, necrotising enterocolitis
- Proximal small bowel stoma or fistula distal to the position of the jejunal tube.
- There can be some counterindications for passing a NJ on a surgical neonate. The NJ should be passed as per local policy for such babies.

Evidence

Insertion of a Jejunal Tube (JT)

The decision for JT insertion and feeding should be taken by a consultant as part of a wider Neonatal MDT discussion and documented in the medical notes and nursing care plan.

There is an increased risk of infection due to it bypassing the stomach acid and its antimicrobial defence, so it is important to use an aseptic technique when inserting and managing an N/OJT.

Preparation

Consent and parent/carer information

Verbal consent for placement of a jejunal feeding tube should be sought from parents/carers.

- Explain to parents or carer the need for the Jejunal tube, the proposed method and the procedure for insertion and on-going care.
- Assess parent/carers understanding of the procedure
- Support parents/carers to be present and comfort their baby during the procedure if they wish. Yorkshire & Humber Neonatal Families - NHS Networks
- Refer to local developmental care guidelines in order to keep baby as comfortable as possible during the procedure. Utilise items such as nests, a dummy (if appropriate and parental consent given), expressed breast milk or sucrose and swaddle patient if appropriate to do so.

Assemble and prepare required equipment

- Jejunal tube of appropriate size

Familiarise yourself with your local equipment and follow manufacturer guidance.

Tubes without guidewires are used in neonates due to the increased risk of perforation.

The tubes should not be stored in a fridge or freezer as this also has the potential to increase the risk of perforation due to the tube becoming firmer.

- A 6Fr (75cm length) is most commonly used and is recommended for neonates and infants less than 8kg.
- A 5Fr may be used in smaller infants with smaller nostrils.
- Occasionally an 8Fr is used in larger infants on the surgical units but this should be at the request of the consultant in charge of the patients care.

Equipment list

- Gastric tube – size 6.0FG (unless larger size indicated by size/clinical condition of the baby) follow manufacturers guidance for size.
- 3 x Enfit syringes (20mL syringe - smaller sizes have increased risk of gastric ulceration due to increase pressures.)
- PH strips
- Tape/tegaderm
- Duoderm
- Scissors
- Tape measure (the tube should not be used to measure the insertion length)
- Sterile water
- Sterile gloves and apron
- Check oxygen attached to Neopuff system and suction is available and working (bag and mask if no Neopuff available)
- Pain/comfort care in line with local procedural pain guidelines.
- Method of hanging feeding bottle or giving set
- Dedicated enteral feeding pump/Enteral syringe driver for smaller volumes*

*(note that if breast milk is being given via an enteral syringe driver an angle clamp should be used to enable full delivery of the fat component of the breast milk) (See appendix 5)

Procedure

(See appendix 1 for Quick reference guide)

During placement of the jejunal tube the baby should be nursed attached to a cardiac and saturation monitor as vagal stimulation by the passage of the tube may cause bradycardia.

If at any time during the procedure the baby becomes cyanosed, apnoeic, bradycardic or distressed, remove the jejunal tube summon help and provide appropriate treatment.

Ideally nurses are expected to stay at the baby's bedside throughout this procedure.

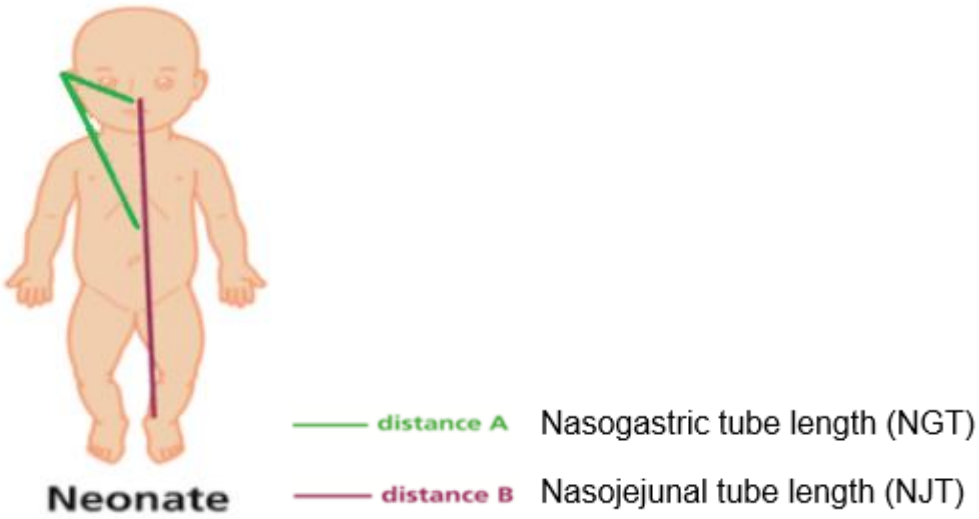
Gastric tubes

Some babies may require an orogastric tube to remain insitu in addition to the Jejunal tube, reasons for this may include the need for respiratory support or certain medications that need to be administered into the stomach. The need for this should be discussed with the medical/surgical team caring for the baby.

Measuring the tube length

The jejunal tube is usually passed nasally (NJT) but occasionally there may be a need to pass the tube orally (OJT) in infants with maxillofacial abnormalities and nasopharyngeal abnormalities. This should be discussed with the consultant caring for the baby.

When measuring the naso jejunal tube length you will need to take 2 measurements. These are a nasogastric length (distance A) and a Naso jejunal length (distance B) outlined below. Orojejunal measurements are discussed in more detail below. Additional measurement options for infants <1 year are available in **appendix 2**.



Nasogastric Tube (NGT) length: 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 **(NEMU)**

Nasojejunal Tube (NJT) Length: Measure the distance from the bridge of the nose down to the ankle with the leg fully extended.

Oro jejunal measurements

Orogastric Tube (OGT)length (Distance A): 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.

Oro jejunal measurement (Distance B): Measure the distance from the midpoint of the mouth to the heel of the outstretched leg.

As the majority of jejunal tubes are passed nasally the term NJT will be used in the rest of the guideline with OJT alterations when relevant in brackets

Preparation

- Wash/Gel hands
- Position baby on the right side and elevate the head end of the incubator/cot (maximum 15 degrees) to assist the tube along the natural line of the gastrointestinal tract.
- Swaddle the baby if appropriate and keep baby comfortable by allowing them to suck on a dummy if able/parental consent obtained.
- Wash and dry hands
- Put on gloves and an apron
- Attach the Duoderm to the baby's cheek, ensuring the edge is in close proximity to the nostril so the infant cannot put their fingers in the gap and pull the tube out.
- If needed and not already in place insert an oro-gastric feeding tube and aspirate gastric contents as per local guidance.
- If the baby has a naso-gastric feeding tube in place, aspirate the gastric contents and then remove. Replace with an oro-gastric feeding tube if needed

Insertion

- Use sterile water to lubricate the tip of the tube /up to 2/3 of the tube.
- Pass the jejunal tube via the nostril into the stomach and check PH (distance A)
- Then using a clean technique flush the NJT tube with 0.5ml of sterile water
- Advance NJT further to required length of NJT placement (distance B):
    - Whilst slowly advancing NJT, continuously rotate the NJT a quarter turn to the right and then left, holding the NJT as close to the nostril as possible. This helps the tip of the NJ pass through the pylorus.
    - If NJT backs out when released, it may be kinked or coiled. Pull NJT back to stomach and repeat steps to confirm gastric position and retry advance to jejunum.
    - Ensure NJT is safely secured with marker showing external to nose.
- All NJT's must be labelled to ensure they are easily identified and not confused with gastric tubes.
- Once procedure is complete reposition infant
- Remove and dispose of gloves and apron
- Wash and dry hands

- Document in the nursing records and on the baby's observation chart that the jejunal tube has been inserted, document size of the tube and which nostril was utilised and the length of tube including external length.
- Jejunal tubes require less frequent changing than nasogastric tubes. Refer to manufacturer's guidance.

Confirming Position of a Jejunal Tube

The NJT position **MUST** be confirmed by X-ray before using the tube.

The X-ray must be checked and NJT position confirmed by a competent practitioner before the tube can be used (see **Appendix 4** for Example, X-ray images.)

On X-ray the NJ tube must be seen to pass across the vertebral column left to right and then pass back across the vertebral column right to left.

The length of the tube at time of X-ray (external length and marking at nose) must be documented in the patients notes and checked routinely including every time the tube is accessed.

Repeated attempts

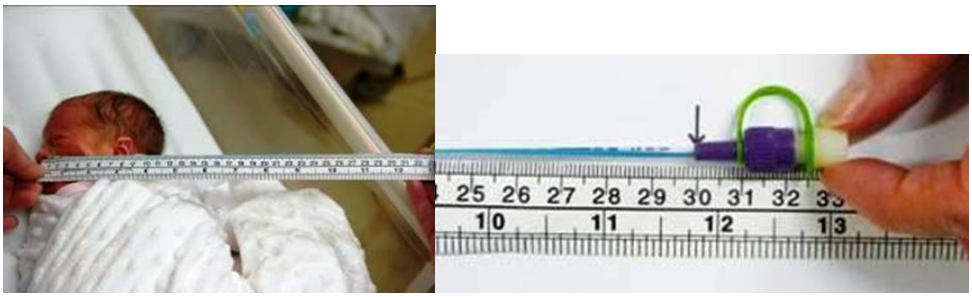
If NJ placement is unsuccessful on the ward (following 2 attempts) this should be discussed with the consultant in charge of the babies care and the local SOP should be followed. The SOP should include the process and criteria for referral for insertion under radiological guidance.

Ongoing NJT position checks: external length

Do NOT Aspirate NJ tubes.

Aspiration of nasojejunal tubes is not a viable method to identify on-going tube position and may cause collapse and recoil of the tube. Aspirate may be difficult to obtain and when it is measured the pH is likely to be variable. An acidic pH is only useful when feeding into the acid environment of the stomach. As the jejunum is more alkaline a pH level will provide no guidance as to whether or not it is safe to feed.

The external length of NJT is measured after insertion. It must also be measured and documented every time the NJT is accessed or hourly in babies receiving continuous feeds. This is the distance from the nose to the end of the tube, before the start of the ridged feed port (see images below)



Document external length on the nursing observation chart/appropriate area of nursing paper or electronic notes.

Assess the nasal area for signs of pressure damage and reposition if required

Suggested Feeding Regimes via Jejunal Tube

- As soon as the jejunal tube position has been confirmed on X-ray, feeds can be commenced.
- All jejunal feeds should be given continuously over a 24 hr period. There is no evidence for feeding “breaks”.
- Bolus feeds of ANY volume into the jejunal tube are contraindicated due to the risk of bowel perforation and diarrhoea (due to dumping syndrome).
- Observe for signs of **dumping syndrome**, symptoms include diarrhoea, stomach cramps, weakness, light headed, palpitations and sweating.
- Follow medical/dietetic advice regarding frequency of feed rate increase, target volume and fluid balance management
- Record fluid balance accurately and include feed, flushes given, vomits, gastric losses, urine & stools/stoma losses.
- If recommended by the MDT a small volume (such as 10mLs/kg) of milk may continue to be given via the orogastric feeding tube in order to provide gastric protection although again, there this is a theoretical intervention rather than evidence based and this must only be commenced following discussion with the MDT due to potential risk of aspiration in some babies.

Flushing

The tube should be flushed with sterile water 4 hourly when not in use or when continuous feeds are running and should also be flushed before, between and after medications.

When flushing clean the port with a chlorhexidine wipe (use locally available wipes) and flush 0.5 ml of sterile water slowly over 20 seconds using a 20ml syringe.

When accessing an NJ/OJ there is an increased risk of infection due to it bypassing the stomach acid and its antimicrobial defence, so it is important to use an aseptic technique.

Aspiration

Do NOT aspirate an N/OJT see ongoing position checks above for further guidance on checking the position of the NJT and **appendix 3** position check pathway.

Care of Gastric Tube (if required)

The gastric tube should remain on free drainage (if not in use) and should be aspirated and tested with PH strips ash per local guidance.

Ensure the tube is clearly labelled to prevent incorrect use

If milk is aspirated from the OGT, this could mean the NJT has moved. Stop feeds and seek medical advice.

Any oro-gastric aspirates should be replaced down the jejunal tube, especially if they contain bile, this is important to prevent malabsorption of fats. These should be replaced with the milk infusion ***(but must not be as a bolus due to the risk of bowel perforation and dumping syndrome).***

Blockage

As the tubes have a small lumen they may become blocked or kinked – indicated by the occlusion of the enteral feeding pump/enteral syringe driver.

If occlusion occurs flush the jejunal tube with 1mL sterile water.

If the occlusion remains follow local guidance if available and ***escalate your concerns*** to senior medical/nursing team who may consider the following to attempt to unblock the tube but consideration must also be taken for the potential to burst the NJ tube with excessive pressure and the risk/benefits of replacing the tube.

- If the initial 1ml flush doesn't clear the blockage or the tube remains stiff to flush, Warm sterile water may dissolve fatty deposits, flush with 5-10ml of warm sterile water.
- Massage the external part of NJT and then repeat flush
- If Omeprazole or Lansoprazole blockage flush NJT with sodium bicarbonate solution

- If unsuccessful prescribe Creon capsule (10,000units) or 1 scoop of Creon micro dissolve granules in 10ml Sodium Bicarbonate 8.4%. Ensure granules have fully dissolved (takes 3-5minutes) and then flush 5-10mls into tube. Leave for 15-20 minutes and flush with sterile water.

If the occlusion cannot be cleared re-pass the jejunal tube

Risks

There are some risks associated with jejunal feeding; these are mostly associated with misplaced or migrated tubes or non-adherence to the guideline. During feeding via jejunal tube observe for the following and seek immediate medical advice and consider stopping feed while awaiting review.

- Bowel/gastric perforation-clinical deterioration, abdominal distension, discomfort, blood stained aspirates or stools.
- Dumping syndrome – abdominal discomfort, distension, diarrhoea, tachycardia and pallor induced by the rapid passage of food directly into the small intestine
- Necrotising enterocolitis – visible bowel loops, abdominal distention, discomfort and blood stained stools
- Diarrhoea – malabsorption due to the jejunal tube having passed too far through the jejunum

Monitoring suspected NJT displacement

Observe for signs of misplacement of NJT e.g

- Breathing difficulties
- Retching or vomiting and/or feed in the mouth or nostrils
- Observe for sudden increases in NGT/OGT losses/aspirates

The above may indicate the NJT is in the stomach

- Stop feed and measure external length
- Request medical review prior to re commencing feed

(See **appendix 3** for Nasojejunal tube position check pathway)

Medications via a Jejunal Tube

Depending on absorption properties some drugs may be unsuitable for administration via the jejunal tube. Check in the neonatal formulary prior to the administration of any

medications via the jejunal tube. If information is not available, please check with the neonatal/local pharmacist.

The tube should be flushed with 0.5 ml of sterile water before, between and after administration of medications to prevent blockages.

Transfer/repatriation with a jejunal tube.

Where appropriate, and indicated, attempts should be made to transition the baby back to gastric feeds prior to transfer to an LNU or SCU. However, should jejunal feeding be required longer term this should not be a contraindication to repatriation.

For babies transferred on jejunal feeds the discharging unit should:

- Ensure that the discharge summary clearly details the rational for NJ placement, the current NJT length at the nostrils and external length and the feeding regimen.
- Ensure where possible there is a plan of action if the tube comes out and is unable to be repassed following attempts by the local unit.
- Send 2 x jejunal tubes (of diameter equal to the tube that the baby is currently using) with the baby.

The receiving unit should check the tube is in the correct position on admission and prior to using. Check previous x-ray, length at nose and external length and that the baby is not exhibiting any behaviours suggesting the tube may be displaced (see monitoring suspected NJ displacement/risks).

All areas should have an SOP covering the escalation process for a baby with a Jejunal tube that comes out and is unable to be repassed on the unit. The SOP should include the process and criteria for referral for insertion under radiological guidance.

NasoJejunal Tubes are a short-term feeding route:

The need for ongoing feeding >30 days should be reviewed by the MDT.

Training

Training needs identified locally to support the implementation of this guideline should be supported by clinical education teams within local units.

References

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Appendices

Appendix 1 Insertion procedure
Appendix 2 Additional methods for NJT measurement infants <1year
Appendix 3 SOP's
Appendix 4 X-Ray examples
Appendix 5 Enteral Syringe driver angle clamp for small volumes of EBM.

Appendix 1: Insertion procedure quick guide

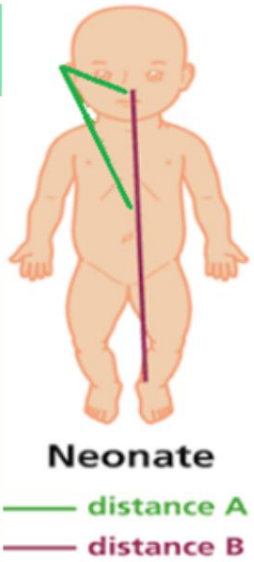
Give parental Information and gain consent

Collect equipment

Ensure cardiac and saturation monitoring is in place

Follow relevant developmental care guidance

Measure the length of the NJT using a tape measure, you will need 2 measurements:
Measurement 1 distance A to stomach: This is the same measurement as for passing an NGT.
Measurement 2: Distance B to Jejunum. Measure from the bridge of the nose to the ankle of an outstretched leg



Attach Duoderm to baby's cheek ensuring edge is a as close to nostril as possible

Position baby on the right side and elevate the head of the cot/incubator

lubricate tube and insert tube via nostril

Advance until in stomach (measurement 1)

Check pH of aspirate (pH 1-5.5) and flush with 0.5ml water

Slowly advance NJT to required length: Measurement 2

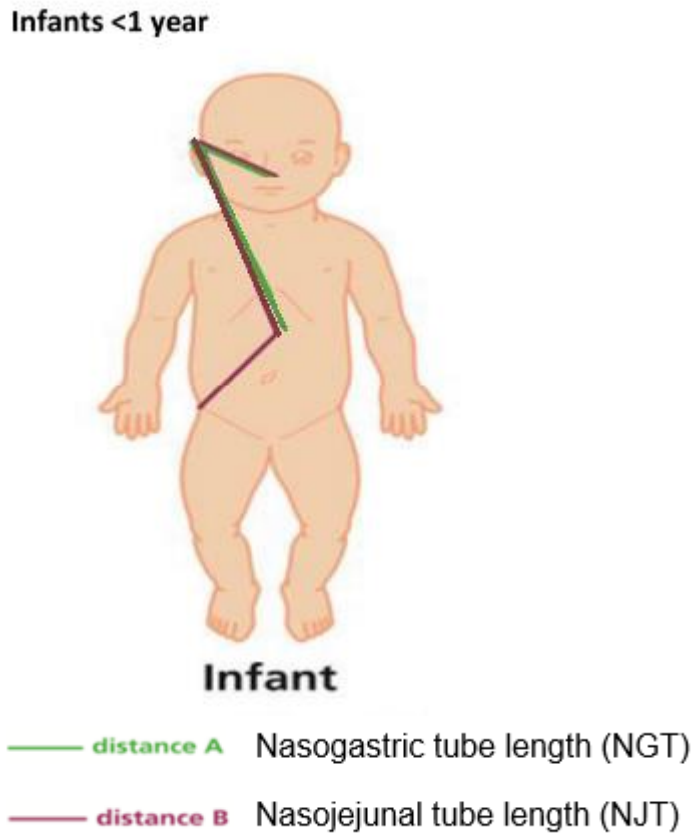
- Using 1/4 turns to the left then right as advancing
- Hold NJT as close to nostril as possible

Secure NJT, label as NJT

Confirm position on X-ray before using tube

Measure and document external length

Appendix 2: NJT measurement infants >28 days and <1 year



Nasogastric Tube (NGT) length: 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 **(NEMU)**

Nasojejunal Tube (NJT) Length: Measure the distance from the tip of the nose to the ear, from the ear to the point midway between the xiphoid process (tip of breast bone) and umbilicus and continue to the right iliac crest.

The Yorkshire and Humber Neonatal Operational Delivery Network

Appendix 3: Nasojejunal tube position check pathway

Adapted from PIER (2021) Bedside Placement and Care of a Nasojejunal Tube

Appendix 4: Example X-Rays

On X-ray the NJ tube must be seen to pass across the vertebral column left to right and then pass back across the vertebral column right to left.

Please note – the jejunal tube may be reported as being in the duodenum a and not the jejunum, the tube is considered to be in an acceptable position as long as it is demonstrated to be through the pylorus.

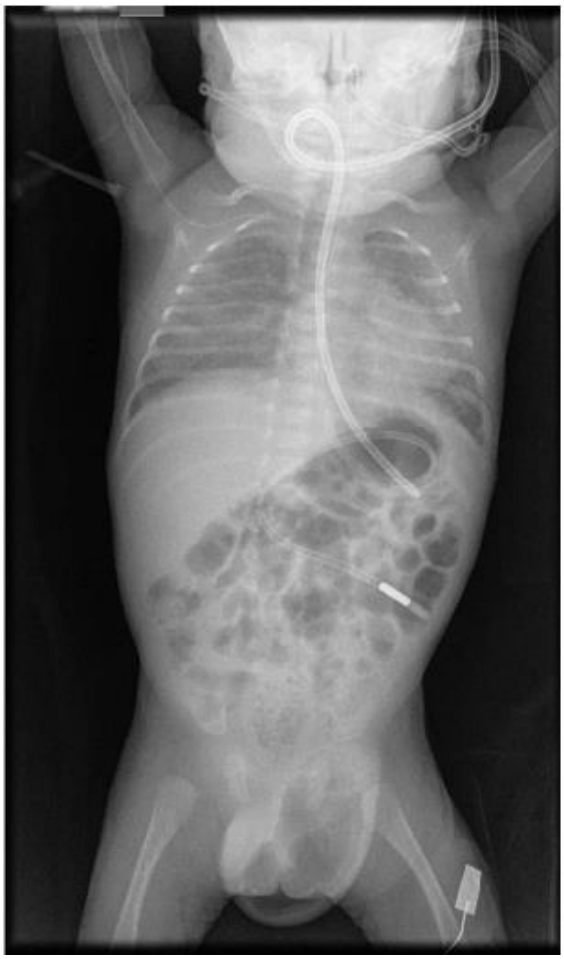


Figure 1.A

Tip of the jejunal tube is projected over the junction of the 2nd and 3rd part of the duodenum.

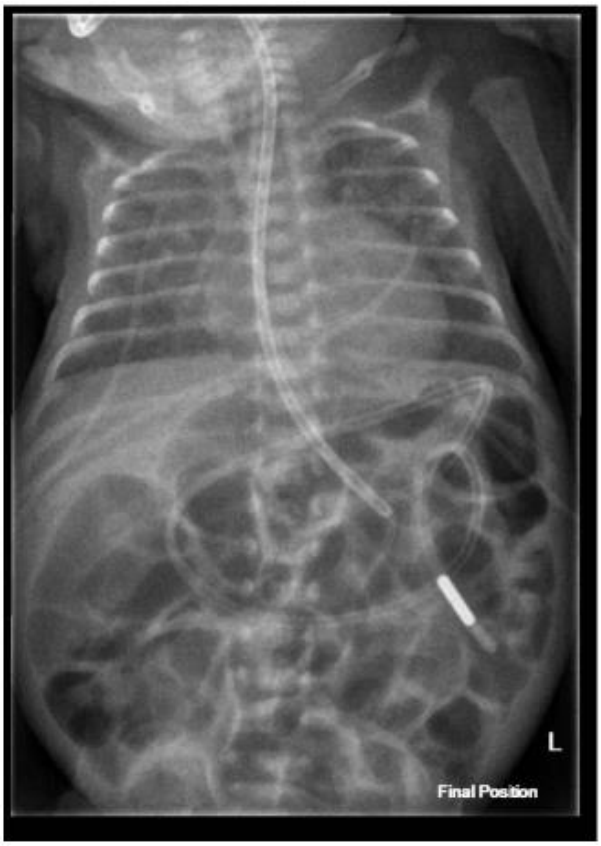


Figure 1.B.

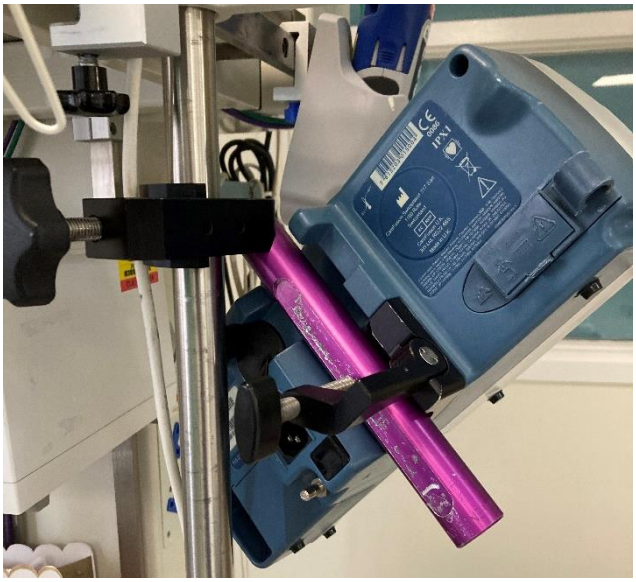
Naso-gastric tube and jejunal tube insitu. Jejunal is projected over the expected position of the jejunal loops

Figure 1.C

Naso-gastric tube seen with the tip projecting over the stomach. Jejunal tube lies with the tip at the junction of the 2nd and 3rd parts of the duodenum.

Pictures used with permission of the Jessop Wing, Sheffield Teaching Hospitals and taken from the STH (2019) *Jejunal feeding guideline*

Appendix 5: Enteral feeding syringe driver angle clamp



9. Version Control Table

Version Control Table - Document History			
Date *(of amendment/ review)*	**Issue No.** *(e.g V1)*	**Author** *(Person/s making the amendment or reviewing the Guideline)*	**Detail** *(of amendment/misc notes)*
March 2024	V1	Marie-Anne Kelly and working group	New guideline