UCSF Health

NEONATAL PEDIATRIC NURSING PROCEDURE

TRANSPYLORIC FEEDING TUBES: INSERTION, PLACEMENT VERIFICATION, MAINTENANCE AND REMOVAL

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Critical Points

1. Enteral feedings are the preferred source of nutrition for critically ill patients. Enteral (transpyloric) nutrition is physiologic and may reduce the incidence of bacterial translocation. Transpyloric feeds are safe and may be better tolerated than gastric feedings due to impaired gastric motility during illness.
2. Radiographic verification of small bowel placement in the duodenum or jejunum must be completed prior to use of the transpyloric feeding tube.
3. Only continuous feeds are given into the small bowel and never bolus feeds.
4. A provider order is needed for insertion, reinsertion, and removal of a transpyloric feeding tube.
5. RNs cannot insert/reinsert a transpyloric feeding tube in any patient who has:
   a. Esophageal or gastric bleeding or known gastric perforation
   b. Nasal abnormalities
   c. Recent nasal/facial trauma or surgery
   d. Recent basal skull fracture
   e. Recent surgical procedures such as:
      i. Cleft lip or palate repair
      ii. Esophageal or gastric surgery
      iii. Alveolar bone graft
      iv. Pharyngoplasty
      v. Nasal revision
      vi. Transphenoidal surgery
      vii. Midface advancement

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6. In event of accidental dislodgement or occlusion, contact a provider.
7. If patient experiences persistent respiratory distress or a sudden onset of severe respiratory distress during or after tube insertion, immediately remove the tube. Notify provider.
8. Use of motility agents, such as Metoclopramide or Erythromycin, may be ordered prior to tube placement. The literature is controversial as to whether motility drugs assist in placement.
1. Only oral syringes and enteral feeding systems manufactured specifically for feeding tubes are used with transpyloric feeding tubes. See ENFit guide in See Care and Maintenance of Nasogastric and Nasoenteric Feeding Tubes (Neonatal/Pediatric).
9. Sterile water for oral use should be used to flush the tube.
10. Medications given via the transpyloric tube should be ordered specifically for transpyloric administration vs. another route such as oral or gastric.
11. Clog Zapper is a natural enzyme that assist with dissolving a clog in a NG/NJ feeding tube if clog is organic matter such as a feeding. If the clog is due to medication(s), clog zapper will not dissolve it, so replace tube and ensure adequate flushing as per flush recommendations. Clog Zapper is not to be used on any altered tube, i.e., feeding tube inserted in J tube arm of a G-Tube. Clog Zapper should not be used with force and if tube visually bulges stop intervention as it may lead to dissection of the tube.
12. Tube replacement is generally recommended every 30 days. Tubes may be used for a longer period and should be reviewed each week after 30 days of dwell by the primary provider team and unit CNS/APN. Document review/plan of use as comment in LDA.
13. Report damaged or dissected tube(s) & save product and package if possible.

Supplies

- Non- weighted naso-intestinal feeding tube (e.g., Corflo) (as appropriate for size of patient and purpose)

Age	NG Tube Size (French)	PMM
Neonate/Infant	6-8 French	6 French PMM 228832 8 French PMM 88842 10 French PMM 124157 12 French PMM 435334 weighted
Child/Young Adult	6-10 French	
Adult	8-12 French	

- Securement:
  - Cavilon No Sting Barrier Film
  - Coloplast for use as a skin barrier
  - 3M Medipore H tape or cloth adhesive tape (½ inch or narrower)
  - Tegaderm
  - OR Nasal Strip-Appendix E
  - OR Bridle
- Scissors
- Clean gloves
- Cup of water and a straw for older children, when appropriate.

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- Oral sucrose for infants
- Pacifier for infants
- Permanent marker
- 60 mL syringe
- Suction system, available and functional

Procedure

PREPARING FOR TUBE INSERTION

1. Obtain and review provider order for placement of transpyloric enteral feeding tube.
2. Explain procedure to parents and child (as appropriate for age/condition) including rationale for tube placement.
3. Contact Child Life for procedural support as appropriate.
4. Ensure NPO 30 minutes prior to tube insertion, or re-insertion, to decrease the likelihood of vomiting and aspiration.
5. Gather supplies, select smallest french size possible to promote comfort.
6. Perform hand hygiene and don clean gloves.
7. Select nares for insertion, if using nasal route. As age appropriate, evaluate patency by occluding each nares.
    a. If tube is being replaced, select opposite nares, if patent.
    b. If nares is contraindicated, may insert orally per order.
8. Depending on securement technique:
    a. Apply Cavilon to upper lip and cheek of selected nare. Cut skin barrier and apply to patient's cheek.
    b. Prepare tape. Cut Tegaderm to size.
9. Administer motility agent if ordered, 30 minutes prior to insertion. (Note: The literature is controversial as to whether this assist in placement.)
10. Position patient as appropriate.
    - Supine with head of bed elevated 30-45° as condition permits.
    - Small child: may need to be held for placement.
    - Neonate: use swaddling.
11. Determine depth of tube insertion for small bowel placement (gastric placement then small bowel placement):
    a. **1st mark:** Gastric placement - use the "Nose-Ear-Mid-Xiphoid-Umbilicus" span method, measuring from tip of nose to the inferior attachment of the ear or earlobe, to the mid-point between the xiphoid process and umbilicus.
        i. Mark tube at this measurement (Figure A).
        ii. Use same process of measurement for oral insertion.
    b. **2nd mark:** Pyloric mark - measure from xiphoid to the right lateral costal margin (the medial margin formed by the false ribs and one true rib).
        i. Mark tube at this measurement (Figure B).
    c. **3rd Mark:** Small Bowel - add 10 cm and mark tube (Figure C).
        i. This is the mark that will be visible at the nare once tube inserted.
12. If using a tube with a stylet, instill 10 mL of water into stylet connector to activate the internal lubricant and aid safe removal of the stylet per package instructions.

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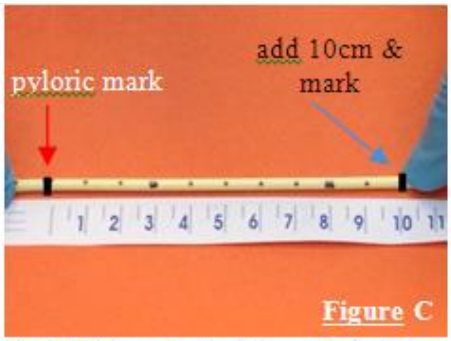
13. Lubrication:
    - For pre-lubricated tubes, activate lubricant by submersing tip of tube in water for 5 seconds.
    - If the tube does not have pre-lubricated coating, lubricate the end of the tube sparingly with water-soluble lubricant prior to insertion. (See package insert to confirm type of lubricant.)



**Add 10cm to the 2nd mark (pyloric mark). This will be the final mark visible from the nares **

TUBE INSERTION

1. For comfort and safety:
    a. If developmentally appropriate, and patient is not NPO for clinical reasons other than tube placement —
        i. Give child a cup of water with instructions to sip on the straw and swallow during tube passage. Ask him/her to tip head forward to facilitate tube passage.
        ii. If appropriate, pre-arrange a child's signal (e.g., raising a hand) to indicate the child feels s/he is about to gag or cough. You may pause advancing tube.
    b. An infant can be offered a pacifier dipped in oral sucrose during insertion.
2. B. To insert: gently but steadily thread tube through selected nares, aiming posterior and parallel to the nasal septum. Advance tube to the 1st mark.
3. Instill 2-5 mL of air. Listen for audible swoosh over epigastric area. Aspirate for gastric contents and/or air.
    a. An audible swoosh, and easy return of air and gastric fluid suggests gastric placement and must be completed before moving to the next step.
4. If resistance is met consider one or more of the following:
    a. Reposition the angle of insertion
    b. Reposition patient's head
    c. Use alternate nares
    d. Use smaller diameter tube, if appropriate.
5. If patient experiences persistent respiratory distress or a sudden onset of severe respiratory distress during or after insertion, immediately remove tube.

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6. After gastric placement, position patient on the right lateral decubitus (left side up) to take advantage of gravity and peristalsis. Ideally, head of bed should be at 15 to 30°.
7. Connect 60 mL syringe to stylet port and ensure other port is capped, adjust plunger to allow for instilling of air.
8. Advance tube about 1 cm at a time, instilling 2-5 mL air each advancement until the 2nd mark is at nares. Advance tube slowly to take advantage of peristaltic waves.
9. Once at 2nd mark (pyloric mark), slowly advance tube 1 cm at a time while insufflating with 5-10 mL of air. (Slow advancement and air insufflation assists with passing tube through the pyloric sphincter.)
    a. If resistance is met or air is not easily insufflated, suspect kinking; or if very easy to advance suspect coiling. Withdraw tube several centimeters and repeat insertion attempt.
    b. If resistance is met right at the 2nd mark when trying to advance tube, the tip is probably right at the pylorus. Have patient cough, gently massage abdomen at the pylorus site, or "tickle" the pylorus by instilling small puffs of air to open it.
10. Once through the pylorus, advance tube slowly to 3rd mark while still instilling 2-5mL of air and auscultating over the right costal margin to assist with ensuring location of tube tip.
    a. In some patients, sounds of instilling air will change from resonant low-pitched gurgles to a higher pitch as tube is advanced into duodenum.
    b. If no sound is heard in this area, tube is probably not transpyloric.
11. Return patient to supine position.
12. Tube is considered to be transpyloric when less than 2 mL of air can be aspirated after instillation of 5-10 mL of air, or if syringe plunger snaps back to 0 mL upon aspiration attempt (snap test).
    a. Temporarily secure and leave stylet in place (if present) in tube until abdominal x-ray (KUB) is completed and correct placement is confirmed.
13. If tube placement is unsuccessful, notify ordering provider.
14. When tube is confirmed to be in the small bowel, remove stylet if present and discard, and secure tube to face while ensuring tube is not placing pressure on any part of the nares. See NG procedure or Bridle for securement instructions.
    a. Stylets may not be reinserted once removed on these types of tubes.
15. Document.

INITIAL VERIFICATION

1. Obtain KUB to confirm tube placement. **Correct placement is confirmed radiographically.**
2. After verification of correct tube placement, clearly identify the centimeter marking at nares with a permanent marker. The exit point mark must remain visible at all times.
3. If tube is in the airway, and patient is not in distress, notify provider and make a plan for removal.
    a. Removal of a tube in the airway may result in pneumothorax and respiratory insufficiency.
4. Provider will place a written order, following x-ray verification by a radiologist, of enteric placement stating "may use feeding tube".

ON-GOING VERIFICATION

1. RN will verify tube placement by confirming mark is visible at nares:
    a. At the beginning of each nursing shift and q 6 hours.
    b. Before instilling fluids or medication.

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2. Radiographic re-verification of placement is required when:
    a. Mark is not visible at nares.
    b. Patient has severe vomiting.
    c. Patient is admitted with existing tube.
    d. Patient's condition changes acutely, even if mark remains visible at nares. Symptoms may include:
        i. Coughing or cyanosis (aspiration is suspected)
        ii. Signs of acute respiratory distress
        iii. Any changes in color, behavior, cry or voice
        iv. Decreased oxygen saturation (when monitored by pulse oximetry)
3. When x-ray is obtained for verification of placement, as read by a radiologist, provider must place an order stating "OK to use tube".

FLUSHING

2. See Care and Maintenance of Nasogastric and Nasoenteric Feeding Tubes (Neonatal/Pediatric).

MEDICATION ADMINISTRATION

1. Medications given via transpyloric tubes must be ordered specifically for transpyloric administration vs. another route, such as oral or gastric.
2. Pause feeding pump while giving medication(s).
3. Flush tube with recommended amount of water prior to and following medication administration.
    a. *Exception:* ICN patients – flush after medication administration only.
4. When giving more than one medication at a time, flush at each of these intervals:
    a. Prior to first medication.
    b. Between each medication.
    c. Following the final medication administered.
5. Resume pump feed.
6. Do not mix medications together or add medications to formula or breast milk.
    a. Liquid medications should be administered when available and appropriate.
    b. IV medications may be needed when liquid medications are not available or appropriate.
    c. Consult a pediatric pharmacist for questions.

HANG TIME FOR FEEDS

1. See Breastfeeding and Breastmilk Procedures (Neonatal-Pediatric)

CHANGING ADMINISTRATION SETS

1. If present see Care and Maintenance of Nasogastric and Nasoenteric Feeding Tubes (Neonatal/Pediatric).

DOCUMENTATION / EDUCATION

1. Document placement:

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a. Time of tube insertion
b. French size of tube
c. Insertion depth (cm marking at nare)
d. How patient tolerated procedure
e. Any problems associated with the insertion procedure
f. Clinician who placed tube
g. Comfort measures used

2. Document at the beginning of each shift placement assessment (visualization of mark at nare).
3. Document any troubleshooting.
4. Provide patient/family education.

Troubleshooting

Problem	Suspected issue	Action
Preventing accidental dislodgement	• Dislocation	• See procedure Nasogastric Enteral Feeding Tubes: Insertion, Verification of Placement and Removal (Neonatal/Pediatric) for method of securement. • Ensure adequate tube securement. • Consider covering hands of neonates with mittens or socks.
Unclogging	• Organic matter clog	• Notify provider if tube is clogged. • Use Clog Zapper to unclog feeding tubes. See instructions in Critical points & Appendix. ○ This system works by loosening, breaking down, and dislodging tube feeding organic matter clogs. ○ Order from Materiel Services. ○ Does not require a provider order. ○ Is safe for all ages and approved by the Food and Drug Administration • Replace feeding tubes that cannot be declogged

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References

Level of Evidence (FAME*)	Level*	Reference
	E4	Clog Zapper by Corpak Medsystems on 2/26/2014 found at: http://www.corpakmedsystems.com/Supplement_Material/SupplementPages/Enteral/ClogZapper/ClogZap_Brochu
	E2	Harrison, A. M., et al (1997). Nonradiographic assessment of enteral feeding tube position. *Critical Care Medicine* (12).
	E2	Spalding, H.K., et al (2000). Bedside placement of transpyloric feeding tubes in the pediatric intensive care unit us gastric insufflation, *Critical Care Medicine:* 28 (6).
	E2	Phipps, L.M., et al (2005). A randomized controlled trial comparing three different techniques of nasojejunal feedin placement in critically ill children. *Journal of Parenteral and Enteral Nutrition*, 29(6) 420-424.
	E2	Meyer, R. et al, (2007) Successful blind placement of nasojejunal tubes in paediatric intensive care:impact of train audit. *Journal of Advanced Nursing. 402-408.*
	E2	Silva, C.C., et al, (2015) Metoclopramide for post-pyloric placement of naso-enteral feeding tubes. *Cochrane Data System Review: Jan 7;1*

* FAME Scale details: See nursing policy *Policy, Procedure, & Competency Development, Review, & Approval*

Procedure History

Author:	Shelley Diane, RN, MS, CNS
Originated:	03/14
Resources:	BCHSF Unit CNS/APN
Reviewed:	3/14 Approved by the Patient Care Standards Committee
Reviewed / Revised:	9/16 Shelley Diane, RN, MS, CNS
	3/22 Jeannie Chan, RN, MS, CNS, Shelley Diane, RN, MS, CNS

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Appendix A: CLOG ZAPPER

Clog Zapper is a natural enzyme that assist with dissolving a clog in a NG/NJ feeding tube if clog is organic matter such as a feeding. If the clog is due to medication(s), clog zapper will not dissolve it, so replace tube and ensure adequate flushing as per flush recommendations. Clog Zapper is not to be used on any altered tube, i.e., Feeding tube inserted in J tube arm of a G-Tube. Clog Zapper should not be used with force and if tube visually bulges stop intervention as it may lead to dissection of the tube.

Use sterile or bottled water when directions say “water”. Instructions are included in the clog zapper package.

Instructional video:

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- CLOG ZAPPER is a patented, food-grade powder, designed to break up formula clogs in most enteral feeding devices.
- CLOG ZAPPER combines an "enzyme cocktail," acids, buffers, anti-bacterial agents, and metal inhibitors in an all-inclusive, ready-to-use system.
- CLOG ZAPPER ingredients all work together to loosen, break down and dislodge formula clogs.
- In clinical trials* CLOG ZAPPER was 100% successful in restoring patency to feeding tubes clogged with enteral formulas.

INGREDIENTS AND BENEFITS

Ingredient	Benefit
Maltodextrin*	Density enhancer
Papain	Breaks down proteins
Alpha-Amylase	Breaks down starches
Cellulase	Breaks down cellulose (fiber)
Citric Acid*	Lowers pH, helps enzymes, antibacterial agent
Disodium Phosphate	Enzyme enhancer
Ascorbic Acid	Keeps enzymes fighting
Potassium Sorbate*	Antibacterial agent
Sodium Lauryl Sulfate	Helps enzyme mixture penetrate clogs
Disodium Edta	Keeps minerals from damaging enzymes in Clog Zapper

All ingredients are food grade.
*G.R.A.S. Generally Recognized As Safe by the Food and Drug Administration