POST-PYLORIC TUBE PLACEMENT

THEORY
Post-pyloric tube placement is a procedure that can be used to provide enteral feeding or medication to a child who cannot tolerate oral or gastric nutrition or medications. In this procedure, a feeding tube is carefully passed through the nose, down the esophagus, through the stomach, and into the small intestine.

PATIENT SELECTION

**Indications:**
- To provide enteral feeding or deliver medications to a child who will not tolerate oral or gastric feeding secondary to:
  - known or suspected risk for aspiration
  - use of non-invasive ventilation
  - severe gastric dysmotility
  - severe pancreatitis

**Contraindications:**
- Nasal, facial, or basilar skull fractures
- Disorders of the esophagus, stomach, or small intestine, including:
  - esophageal atresia
  - severe esophageal or small intestinal stricture
  - esophageal or gastric perforation
- Caution performing this procedure in patients:
  - receiving anticoagulant therapy
  - that have a bleeding disorder or thrombocytopenia (platelet count < 50,000)

EQUIPMENT

<table>
<thead>
<tr>
<th>Styletted feeding tube</th>
<th>Lubricant</th>
<th>Stethoscope</th>
<th>Clear adhesive dressing</th>
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<tbody>
<tr>
<td>Syringe</td>
<td>Tape</td>
<td>Sharps container</td>
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PROCEDURE

1. **Measurement of tube.** Using a styletted feeding tube, measure first from the patient’s nose to ear, then from ear to xiphoid process (this length is for stomach placement) and mark the tube. Next, measure from xiphoid process to mid-axillary line (this length is for duodenal placement) and make a second mark. Finally, add a few more centimeters of length to the tube to ensure that the tube reaches the jejunum, and make a third mark. (Figure 1).

- 5 cm for newborn - 1 year
- 7 cm for 1-4 years
- 10 cm for greater than 4 years

2. **Placement of post-pyloric tube.**
- Place patient on his or her right side, which will facilitate gravity movement of tube through the stomach and past the post-pyloric sphincter.
- Lubricate your tube with a water-soluble lubricating jelly.
- Attach a syringe to the end of the post-pyloric tube, which will enable you to inject a bolus of air to move the tube past the stomach, as well as to later confirm placement of the tube.
- Pass the tube through the nose to the first marking that you made on the tube; the tube should be in the stomach.
  - Confirm placement by taking a pH aspirate; a pH of 5 or less indicates successful stomach placement.
  - Inject 5 mL of air through the attached syringe, and listen over the stomach with a stethoscope for a rush of air. A rush of air often indicates that your tube has been successfully placed in the stomach (Figure 2).
- While injecting a 5mL bolus of air to open the pyloric sphincter (Figure 3), advance the tube to your second marking. The tube should move smoothly once you have gotten past the stomach.

Figure 1: Make three measurements for post-pyloric placement: (1) Nose-to-ear, then ear-to-xiphoid process, (2) xiphoid process to mid-axillary line, (3) Addition of a few more centimeters to allow tube to pass into jejunum.

Figure 2: Confirm placement into the stomach, when at the stomach marking, by injecting air and listening for a rush of air over left upper quadrant.

Figure 3: Inject air to open the pyloric sphincter.
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- If you continue to have no resistance, advance to the tube to the final marking (Figure 4). The tube should be in the jejunum.

3. Confirm tube placement. There are several tests that will help you to confirm successful post-pyloric placement:
- Snap test: Using the syringe connected to the end of the tube, instill approximately 5 mL of air into the bowel. Attempt to pull back on the syringe. If you are in the small intestine, you will not be able to remove any air, and the syringe will “snap” back into position because of a vacuum created by the mucosa being pulled into the end of the tube. This is a positive snap (Figure 5).
- Listen for sounds: Instill 5 mL of air into the tube, and listen with a stethoscope for sounds over different portions of the gastrointestinal tract. If the tube has been placed in the small intestine, you will hear:
  - Stomach: Faint gurgling
  - Esophagus: Absence of air
  - Upper right quadrant of abdomen: High-pitched crackling or gurgling noises
- Abdominal x-ray: An abdominal x-ray can confirm post-pyloric placement.

4. Remove stylet. Remove the stylet from the post-pyloric tube. Since the stylet has been pre-lubricated, it should come out of the tube easily.
- Clinical Pearl - To make removal of the stylet easier, you may consider flushing the tube with normal saline prior to removal.

5. Care and maintenance:
- Flush tube every 8 hours with 5-10 mLs of water in order to prevent any unwanted build-up of feeds.
- Flush tube with 5-10 mLs of water after each medication administered through the tube.

6. Visually confirm NG tube every time prior to using tube. Prior to using the NG tube for administration of feeds or medications, you must ensure that the NG tube is in the appropriate depth every time. Ensure that the pre-determined mark remains at the nare and has not changed in location.

Troubleshooting
- If you experience resistance while flushing the tube, before or after administrations of feeds and/or medications, flush the tube with 10 mL of water or normal saline and try to pull back on the syringe. This should help to break up any obstruction that may be present in the patient’s tube.

COMPLICATIONS
- Inadvertent placement into the lungs
- Nasal, gastric or small intestinal bleeding
- Feeding-related diarrhea
- Gastric, esophageal, or small bowel perforation

ASSESSMENT AND MONITORING
- Monitor vital signs, including oxygen saturation
- Observe for coughing
- Assess patient comfort
- Note: It is advised that you assess and monitor these clinical features before, during and after the procedure.

DOCUMENTATION
- Indication for procedure
- Date and time of procedure
- Depth of tube insertion
- Confirmation of post-pyloric placement - presence or absence of “snap” and confirmation on abdominal x-ray
- Vital signs before, during and after procedure
- Patient’s comfort during procedure
- Adverse reactions

REFERENCES

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