Enteral Feeding Access:
Your BFF or Frenemy?

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Disclosure Information
• No disclosures to report

Objectives
• The audience will be able to identify common reasons children require alternative feeding access.

• The audience will be able to identify common surgical procedures to place gastrostomy tubes.

• The audience will be able to discuss common complications or issues with gastrostomy tubes and identify solutions.
Why would a patient need enteral access?

The patient cannot maintain adequate growth and development by oral nutrition alone.

**Reasons include:**

- Failure to thrive
- Aspiration or swallowing dysfunction (failed OPM study)
- Chromosomal or genetic abnormalities
- Oral aversion
- Cystic fibrosis
- Prematurity

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**Workup for Enteral Access**

- Complete history and physical examination
- Consider nutrition labs
- Obtain nutrition consult
- Review of symptoms, reason for access
- Upper GI study to rule out malrotation
- Possible pH probe to evaluate for significant reflux
- Possible nuclear medicine gastric emptying study
- Decision about kind of access required

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**Temporary Feeding Access**

- Should generally only be used for 12 weeks, but can be used for months at a time
- NG: nasogastric tube
  - Placement length can be determined by calculation or measurement: 3x weight (kg) + 13 cm
- OG: orogastric tube
  - 3x weight (kg) + 12 cm for OG tubes
- NJ: nasojugal tube (typically placed under fluoroscopy)
- EBP: pH measurement of aspirate for OG/NG to confirm placement
Permanent Enteral Access

- Choice of gastrostomy (G-tube), jejunostomy (J-tube) or gastrojejunostomy (G-J tube).
- G-tube: PEG, open G-tube placement with STAMM procedure, or laparoscopically placed G-tube

PEG placement

- Utilizes endoscopy to place the PEG tube
- Typically, scope transilluminates the abdominal wall through the stomach where the needle should be placed
- Then the guide wire is passed through the catheter into the stomach
- The scope pulls the guide wire out through the mouth, and the gastrostomy is attached and then pulled through the esophagus, stomach and the external tube is pulled through the abdominal wall
- Then placement of the bumper is confirmed again via endoscopy


Open Gastrostomy

- Requires general anesthesia
- Stab incision is placed in the LUG, stomach is pulled up to the abdominal wall via Stamm sutures
- Tube is introduced and incisions are closed around the gastrostomy
- Can be primary button or long gastrostomy tube placement

Laparoscopic Gastrostomy

- Requires general anesthesia
- Camera is placed at umbilicus
- Three other port incisions are placed for graspers including the gastrostomy site
- U sutures are placed through the stomach and then through the abdominal wall
- Needle is introduced into the stomach, and then the incision is dilated up to appropriate gastrostomy size
- Then the gastrostomy is placed over a guidewire into the stomach, and the balloon is inflated
- The camera confirms that the gastrostomy is in the stomach, and the U sutures are tied over the gastrostomy button (removed 48-72 hrs later)

Permanent Enteral Access

Laparoscopic Jejunostomy
• Can be chosen for patients with reflux or a suture line proximal to the stomach
• Usually will be a Roux-en-Y jejunostomy for permanent access
• Requires general anesthesia, 4 ports are placed
• Proximal jejunum is divided, and an end to side anastomosis is created. Then the tube is introduced into the Roux limb and the incisions are closed.


Types of Tubes

Long balloon gastrostomy tube
• Long gastrostomy, no extra access device required
• Balloon gastrostomy

Low profile balloon gastrostomy tube
• Smaller, closer to the abdomen
• Requires additional access device attachment prior to feeding
• Can be easier for patients to do “tummy time.”

PEG tube
• No balloon, requires removal either using traction or endoscopy

Non-Balloon Low Profile Gastrostomy
• Has smaller bolster than PEG
• Typically placed/removed in clinic
Post-operative Feeding Protocols

- Immediate post-operative protocols not standardized; most include some period of NPO, followed by clear liquids and advancing to continuous formula feedings.
- Monitor labs for refeeding syndrome PRN.
- Most teams proceed from continuous feeds to bolus feedings, although impact of timing is not well understood.

Post-operative Skin Care

- Most primary buttons just need gentle washing with soap and water.
- If gauze is used for drainage, should use a 2x2.
- Long tubes may require stabilization depending on presence of flange.
- Some providers also stabilize the tube by using a foam dressing with a key-hole shape cut out of it.

Changing the Gastrostomy

- Balloon gastrostomies are changed every 3-6 months.
- Stoma sizes can change with growth, weight gain and post-operative swelling.
- Measurement devices are used to determine appropriate length.
- Water is removed from the old gastrostomy, the stoma is measured, and then the new gastrostomy is placed.
- How to confirm placement? **New EBP:** Aspirate gastric contents to determine appropriate placement; it is a test that is both sensitive and specific.
Troubleshooting

- Granulation tissue: the enemy
- Thought to be caused by friction, moisture or trauma and is the result of abnormal wound remodeling
- Tissue is very vascular and can ooze a thin, greenish discharge
- Treatment: Make sure the tube is secure and stable, fits appropriately, reduce friction by removing feeding access device, treat if needed with silver nitrate, triamcinolone or GranuLotion
  
  Abdelhadi, RA, et. Al

Troubleshooting

- Leaking gastrostomy: the enemy
- Check sizing of the gastrostomy but beware: a larger French size will not fix this problem!
- Protect the skin: zinc oxide cream, or foam dressing that wicks away moisture can work well
- Infection is rare, but can be present. Can use systemic antibiotics but studies suggest that silver impregnated dressings have also been proven effective and antibiotic resistance is rare.
  

What if the gastrostomy falls out?

- If new gastrostomy tube, be very gentle with replacement; stomach wall dehiscence can happen.
- Have a replacement tube available at the bedside (12 and 14 FR). If G-tube not available may use foley catheter and stabilizer dressing
- If tube has been out for a long time (>1-2 hours) and the gastrostomy opening looks to be closed down, dilate up the tract using 8Fr→10Fr→12Fr→red rubber catheters or feeding tubes with goal of placing a low profile balloon gastrostomy.
- If new g-tube or dilation of tract required, do not feed through tube until fluoroscopy study obtained to confirm placement in the stomach (with no evidence of extravasation)
- Study suggests ultrasound may be used to confirm gastric tube placement
  
Thank you!