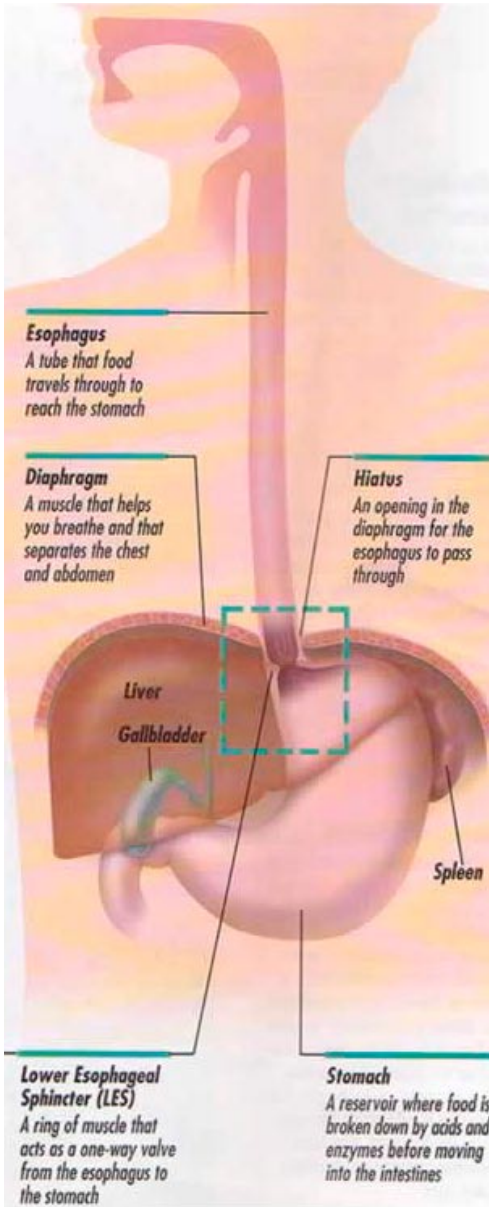


Nissen Funduplications and Feeding Tubes





The Gastrointestinal Tract:

The gastrointestinal (GI) tract goes from the mouth to the anus. In the normal GI tract, food enters the mouth where it is chewed and partially broken down by saliva. When swallowed, food then enters the esophagus. Food then passes through the lower esophageal sphincter (LES), the opening to the stomach. Normally, the LES opens when you swallow allowing food to enter the stomach, then it closes. With Gastroesophageal Reflux Disease (GERD), or reflux, the LES does not work right. It allows food and stomach acid to go back into the esophagus.

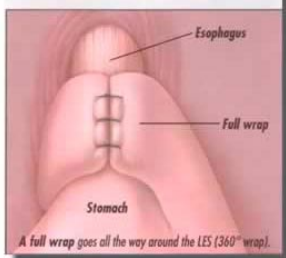
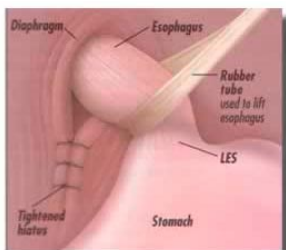
What is reflux?

Gastroesophageal reflux is the movement of food and acid from the stomach back into the esophagus. Reflux often causes gagging, vomiting, and pain or burning in the stomach and/or chest. Many children with reflux have frequent upper respiratory infections, poor weight gain, and/or pain or vomiting when lying down. Some children may even reflux and aspirate into the lungs, causing pneumonia. It is common for newborns to have some degree of reflux and most stop refluxing as they get bigger/older. There are some children whose reflux is bad enough to slow their growth. Most children are able to be treated with formula thickening, feeding in a more upright position, and/or possible medicines for reflux. When these treatments do not help, sometimes surgery is needed to fix the child's reflux. The anti-reflux procedure is called a Nissen Fundoplication.

How is reflux diagnosed?

There are many studies a doctor may order to diagnose or confirm reflux. These studies include the following:

- 1. Upper GI:** The child swallows a small amount of barium and x-rays are taken, watching the barium travel to the stomach. If barium is seen traveling back up the esophagus, the child has reflux. This study is usually done as an outpatient.
- 2. pH probe:** The child is admitted to the hospital for 24 hours. A small wire with a sensor is placed through the nose into the esophagus. This sensor measures any acid or reflux episodes.
- 3. Bronchoscopy:** This test looks for damage or irritation/swelling in the airway, which can be caused by reflux. The child is sedated (made sleepy or put to sleep) for this procedure. A small telescope is passed into the airway to look for irritation or inflammation from reflux that is aspirated (enters the airway).
- 4. Esophagoscopy -** This test looks for damage or irritation/swelling in the esophagus, which can be caused by reflux. The child is sedated for this procedure. A small telescope is passed in the esophagus to look for irritation or inflammation from reflux. A biopsy of the esophagus, or small pieces of tissue, may also be obtained to check for inflammation, or esophagitis.



What is a Nissen Fundoplication?

A Nissen fundoplication is a procedure done to prevent reflux. This procedure can help a child with reflux and does not stop the ability to swallow or eat by mouth. A Nissen is done by wrapping the top part of the stomach (the fundus) around the outside of the esophagus. The wrap is stitched in place. This procedure can be performed through either a single cut or with the help of a laparoscope, (a special instrument similar to a telescope). The procedure is permanent and is not undone later.

What is a Gastrostomy Tube (G-tube)?

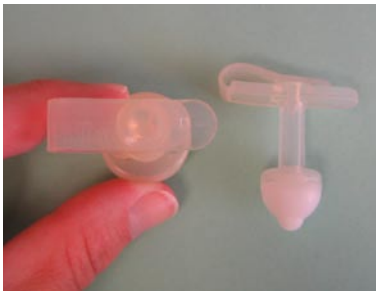


A Gastrostomy Tube (G-tube) is either a tube or button (skin-level device) placed into the stomach through the

abdominal (belly) wall. This is usually done during the same operation as a Nissen fundoplication if the child also has reflux. A gastrostomy tube is needed when the child cannot take enough nutrition by mouth for proper growth and development, and also to "burp" a baby who has had an anti-reflux procedure (Nissen Fundoplication). The type of tube used will depend on the size and needs of the child. The different devices are: Malecot tube, MIC-Key, or Bard button.

What is a PEG tube?

Another type of gastrostomy tube is the Percutaneous Endoscopic Gastrostomy tube, or PEG tube. This means the tube is placed with the help of a scope. In the operating room, the scope is passed into the mouth and down to the stomach. A small opening is made in the stomach and a tube is placed. No other cuts are made. This procedure is usually for children who do not need an anti-reflux procedure.



Many children require both a Nissen fundoplication and a G-tube.

However, depending on their needs, some children only require a fundoplication, while others only require a G-tube.

Expected Hospital Stay

Generally, the child will come to the hospital the day of the surgery and will be admitted after the procedure. Most children stay in the hospital about three to five days after surgery. If the child only receives a feeding tube (no anti-reflux procedure), the hospital stay may be less. The time spent in the hospital will include slowly advancing feedings, teaching family members how to feed the child, and general care for the gastrostomy tube. Arrangements will be made for delivery of feeding supplies by a home care company.

Feeding through a G-tube

There are many ways to feed through a gastrostomy tube. A feeding plan that meets the child's needs will be created. The two most common types of feedings are:

1. **Bolus:** a specific amount of formula is given at a set time. The formula runs in the tube by gravity. For example, 5 ounces every 3 hours.
2. **Continuous/Pump:** Formula is given over an extended amount of time by using a pump. For example, 1 ounce per hour for 24 hours.

Care of G-tubes

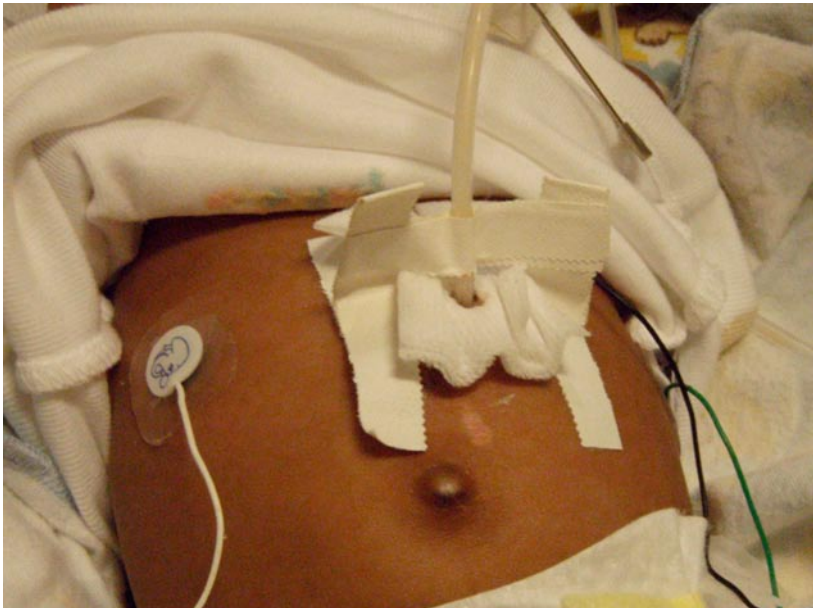
1. **Securing the tube:** This depends on the type of tube that is placed. All tubes/buttons have a balloon or mushroom-shaped part on the inside of the stomach. It is important that the tube stay in good position to keep from having problems with leakage. If your child has a MIC-Key button, the water should be checked once a week, once you have been shown how to do this. If your child has a Malecot tube, tape is used to secure the tube. (See "Taping the G-tube")
2. **Cleaning around the tube:** Skin care should be done with soap and water once a day. No daily antibiotic creams or ointments are needed, unless you are told to do so by a doctor.
3. **Bathing:** Keep the area dry for the first 3 days. After 3 days, sponge baths or showers are allowed. Do NOT soak the area in a tub or pool for the first 2 weeks.

Taping the G-tube:

This is also called “H-taping” or “goal post taping:”

Need: Three pieces of tape 1/2 inch wide and about 3 inches long, 2x2 gauze, gray plug

1. Fold one piece of tape in half, leaving two tabs for sticking to the skin.
2. Do the same with another piece of tape.
3. Place the pieces of tape on the opposite sides of the gastrostomy tube, about 1/2 inch from the tube. (This makes the legs of the “H” or posts of the goal post).
4. Take the last piece of tape and wrap around the top part of the tape sticking up and the gastrostomy tube, about 1/2 inch above the skin. (This makes the cross-bar of the “H”)
5. Take a 2x2 gauze rolled up and place around the gastrostomy tube and under the last tape (the cross-bar of the “H”). This will help protect the child’s skin and help keep the area dry.
6. The tape should be changed every couple days, unless it starts to peel off sooner.



What happens if the G-tube comes out?

1. Stay calm. The site may bleed or ooze a little.
2. The site may begin to close over after a couple hours. You must do one of the following as soon as possible.
 - a. Place a foley catheter in site (see "How to place a foley catheter") or change the button if you know how.
 - b. If you cannot place a foley catheter, or have not been shown how,
 1. Go to nearest hospital Emergency room (if you live in the Grand Rapids area, go to Helen DeVos Children's Hospital)
 - 1.1. If you have a spare MIC-Key or Bard button at home, bring that with you to the Emergency Room
3. Notify the Pediatric Surgeons' Office at (616) 458-1722 during business hours

How to place a foley catheter:

*** Do this ONLY if you have been shown how**

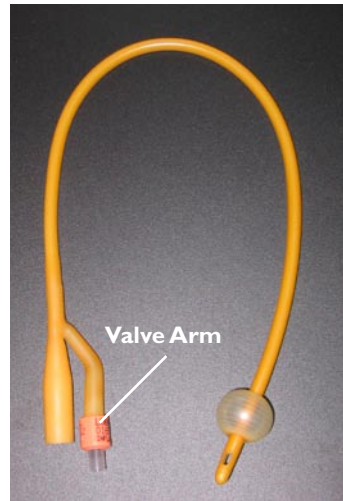
1. Find your emergency kit and lay out the following supplies:
 - a. Foley Catheter (spare tube)
 - b. A 6ml or 12ml syringe with 5ml water
2. Wash your hands with soap and water
3. Lubricate the end of the catheter with water, KY jelly, or surgilube. Do not use Vaseline or petroleum products.
4. Insert the catheter into the opening on the child's stomach about one inch past the deflated balloon area on the catheter.
5. Inflate the balloon with 5ml of water by connecting the water-filled syringe to the valve arm (see picture). After pushing all the water into valve arm, hold the plunger of the syringe down and twist/pull the syringe off.

6. Gently pull back on the tube until resistance is met. This means the inflated balloon is resting inside against the stomach opening.
7. Cap the end of the new tube with the gray plug provided.
8. Tape the tube to the child's skin so the tube is secure. (see "Taping the g-tube")

Troubleshooting for Gastrostomy Tubes

If there is:

- 1) Leakage or drainage around the tube
 - Drainage may be whitish, yellowish, greenish, or slightly bloody
 - Drainage may increase if your child is sick with a cold or flu
 - Clean and protect the skin with gauze
 - If skin around gastrostomy tube becomes irritated/red, you may use Sensicare, Magic Butt Cream, or diaper rash cream on the area for a couple days. Do not use antibiotic ointments.
 - If your child has a MIC-Key button, check the water in the balloon if you have been shown how (there should be about 5ml of water).
 - Call the Pediatric Surgeons' office if leaking does not improve, or if formula is pouring out around the tube/button.
- 2) Pink/bumpy tissue around the tube/button (granulation tissue)
 - If it is not causing increased leaking/drainage, your child may not need treatment
 - There may be some bloody drainage with movement of the gastrostomy tube or button.
 - Call the Pediatric Surgeons' office (during business hours) for treatment options or wait until your next scheduled appointment.



3) Redness around Gastrostomy tube/button

- a. It is normal to have a small rim around the button/tube.
- b. If your child has a lot of drainage/leakage, protect the skin with SensitiveCare, or a diaper rash cream for a couple days.
- c. If the area of redness is spreading, area is warm/hot to touch, and/or your child has a fever; call the Pediatric Surgeons' office

Questions?

Pediatric Surgeons of West Michigan

330 Barclay, Suite 202

Grand Rapids, MI 49503

(616) 458-1722

Important Information and Follow-up Appointments

Size and Type of Gastrostomy Tube:

Home Care Company:

Feeding Schedule:

Pediatric Surgeon and Follow-up Appointment:

Dr. _____

Location: 330 Barclay Suite 202, Grand Rapids, MI 49503

phone: (616) 458-1722

Pediatrician Follow-up:

Other:

References:

<http://bardaccess.com/feed-peg.php>

Gastroesophageal Reflux Disease: A Look at Medical Treatment and Laparoscopic Surgery.

University of Michigan Section of Pediatric Surgery website: "Gastrostomy Tube Placement," and "Gastroesophageal Reflux and Fundoplication."