FEEDING TUBES

Dr. Ahmad Jaafar

DISCLOSURES

- None

AGENDA

- Definitions
- Indication for tubes
- Types of tubes
- Types of connectors
- G-tube placement & replacement
- Post-operative care
- Daily care
- Venting G-tube
- Flushing of tubes
- Mouth care
- Common complications

DEFINITIONS

- **G-tube:** Tube inserted through the abdomen directly into the stomach
- **GJ-tube:** Tube inserted through the abdomen directly into the stomach, then threaded into the jejunum
- **Surgical J-tube:** Tube inserted SURGICALLY through the abdomen directly into the jejunum

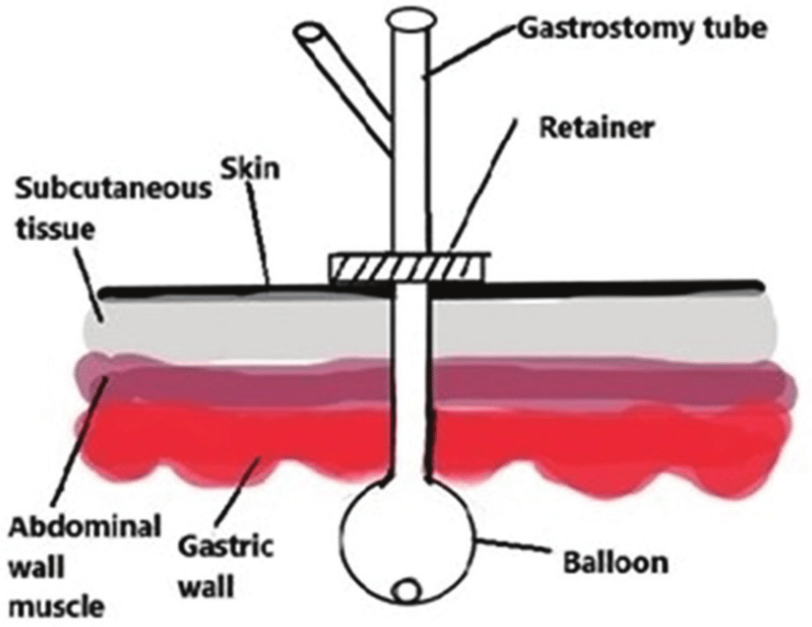
NG and NJ are temporary tubes and outside the scope of the presentation.

DEFINITIONS

- **Stoma:** Opening through the abdominal wall where the tube enters the body

DEFINITIONS

- **Tract:** Channel-like formation between the stomach (or jejunum) and skin, created from continuous opposition created by the tube



INDICATIONS

1. **Nutritional support (feeding)**
   - Can supplement oral feeds, or replace them completely
   - Feedings can be given directly into the stomach (G-tube) or small intestine (GJ-tube or surgical J-tube)
   - Usually placed when enteral feedings are needed **> 6-12 weeks** (often after a trial with NG-tube)
2. **Administering medications**
3. **Stomach decompression**

SPECIFIC INDICATIONS

Dysfunctional swallowing/risk of aspiration with PO intake ○ Example: CP	**Failure to thrive/poor growth** Inadequate oral caloric intake/high caloric needs ○ Examples: Oral-motor dysfunction, feeding aversion, GERD, specific disease processes (e.g., CF, CHD, CKD, malignancies)
Need for special diet ○ Examples: IBD, metabolic disease	**Medications necessary for health** ○ Examples: HIV meds, anti-seizure meds
Cranio-facial abnormalities ○ Example: Pierre Robin	

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

Low profile

Mic-Key

GJ-tube

Surgical J-tube

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

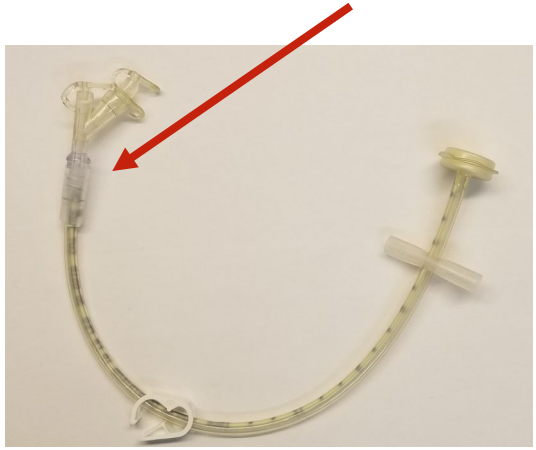
Low profile

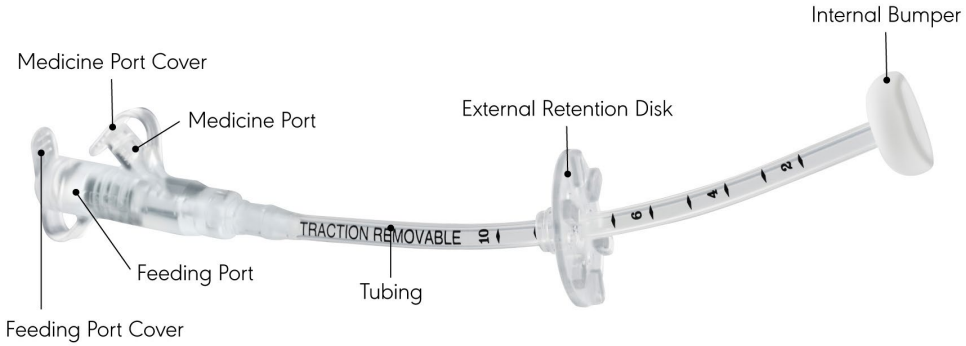
Mic-Key

GJ-tube

Surgical J-tube

Y-connector





2 Ports: Feeding port, medication port

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

- **Percutaneous endoscopic gastrostomy tube**
- **High-profile** feeding tube
- Placed by **Pediatric Surgery in the OR** at MUMC
- **Duration:** Usually lasts for **2-3 years**; can last > 3 years
- **Multiple sizes:** 12, 14, 18, 20, 24 F (diameter)
- Has a **bar** to prevent migration into the abdomen
- **Y-connectors** replaceable

Low profile

Mic-Key

GJ-tube

Surgical J-tube

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

Low profile

Mic-Key

GJ-tube

Surgical J-tube

- **Advantages:**
  1. No balloon to break
  2. Long tube provides easy access for night-time feeds
  3. Hard to dislodge (but keep tucked into clothing when not in use to prevent accidental dislodgement)
- **Disadvantages:**
  1. Long tube (needs securing)
  2. Not easily reinserted if accidental dislodgement (needs **surgical reinsertion**)

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

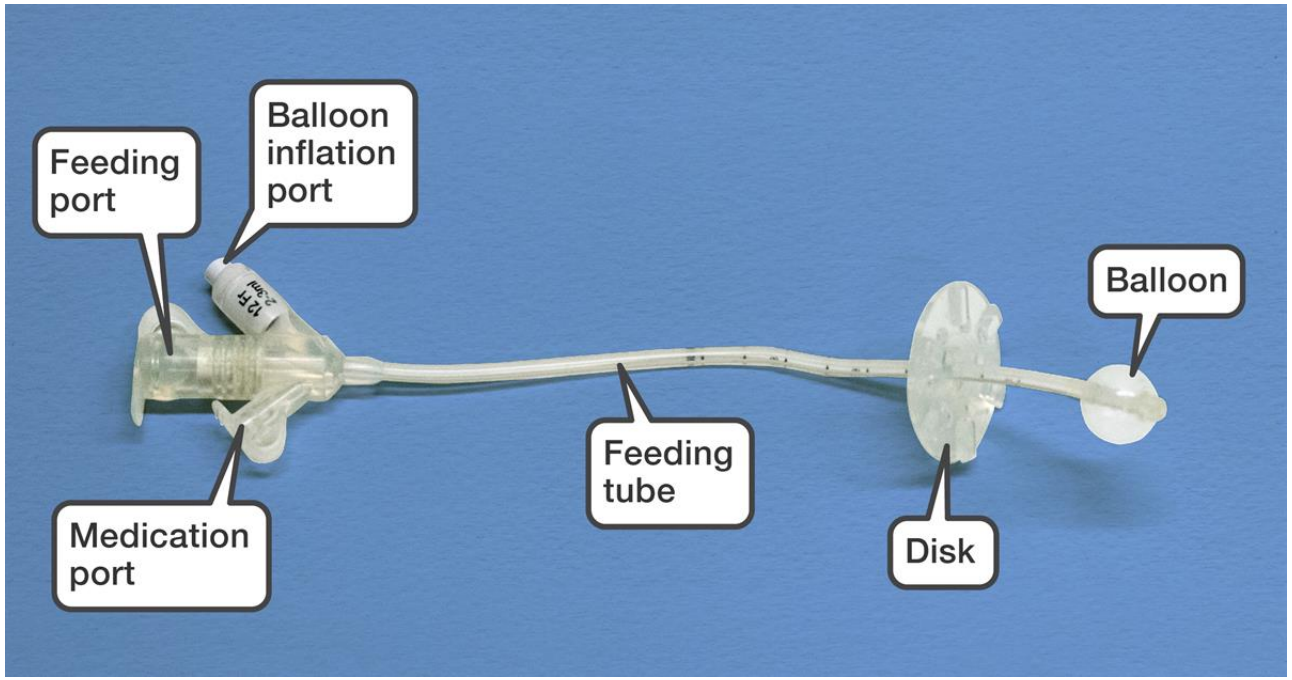
Malecot & Pezzer

Low profile

Mic-Key

GJ-tube

Surgical J-tube



3 Ports: Feeding port, medication port, balloon port

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

- **PEG + balloon**
- Placed by **Pediatric Surgery in the OR** at MUMC
- Has a **disk** to prevent migration into the abdomen
- **Balloon:**
  - Inflated with sterile water
  - To be checked once/week
    - Age < 1 Y/O: 3 mL
    - Age > 1 Y/O: 5 mL

Low profile

Mic-Key

GJ-tube

Surgical J-tube

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

Low profile

Mic-Key

GJ-tube

Surgical J-tube

- **Advantages and disadvantages are similar to PEG with the following exceptions:**
  - Balloon can break
  - Balloon → easier dislodgment
  - Easily reinserted if accidental dislodgement

TYPES OF TUBES

G-tubes:

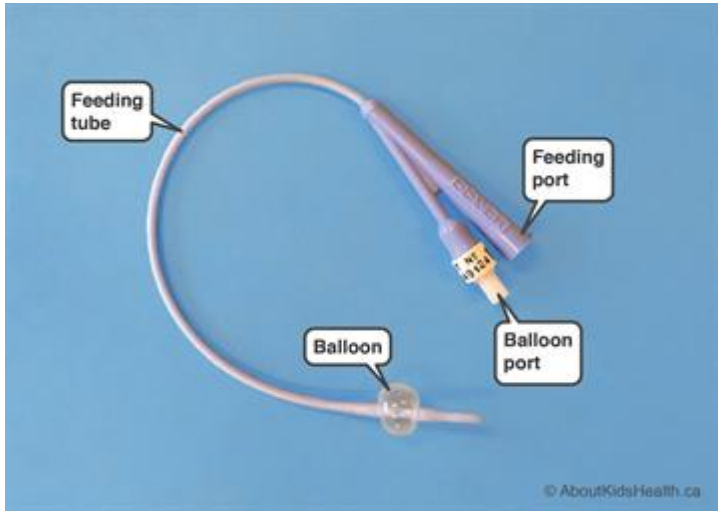
High profile

PEG

Mic-G

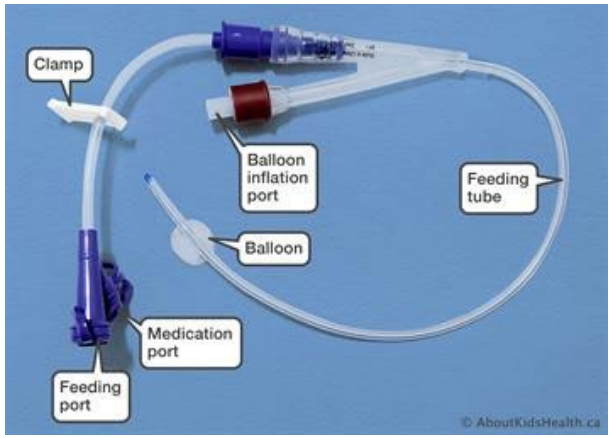
Foley

Malecot & Pezzer



Low profile

Mic-Key



GJ-tube

Surgical J-tube

Foley (2 ports):
Feeding port, balloon port

Extension (2 ports):
Feeding port, medication port

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

Low profile

Mic-Key

- Often used after **accidental dislodgment** of the G-tube to keep the tract open (can close in < 1 hr)
- Essential component of the **Emergency G-tube Kit**
- Must be secured to the abdomen with a **tape**
- **Balloon:**
  - Inflated with sterile water
    - Age < 1 Y/O: 3 mL
    - Age > 1 Y/O: 5 mL
- **Extension (Kangaroo extension):**
  - Has a clamp, and 2 ports (medication and feeding ports)

GJ-tube

Surgical J-tube

TYPES OF TUBES

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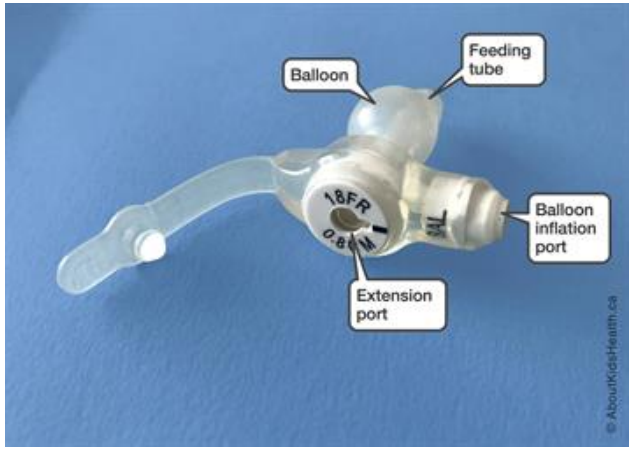

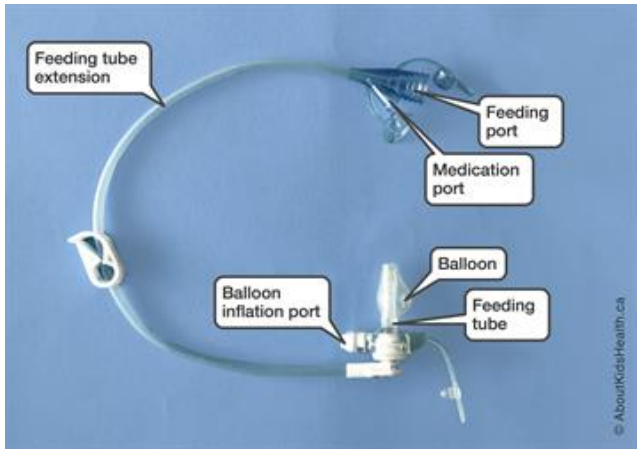

Mic-Key (2 ports):
Balloon port,
extension port

Extension (2 ports):
Feeding port,
medication port

TYPES OF TUBES

G-tube

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

Low profile

Mic-Key

GJ-tube

Surgical J-tube

- Balloon-type button G-tube
- Placed in a **mature G-tube tract** (> 3 months after PEG) – secondary device
- **Duration:** 3-6 months, sometimes longer
- **Multiple sizes:**
  - 12, 14, 18, 20, 24 F (diameter)
  - 1-5 cm (tract length)
- **Balloon:**
  - Inflated with sterile water
  - To be checked once/week
    - Age < 1 Y/O: 3 mL
    - Age > 1 Y/O: 5 mL
- **Extension:**
  - Requires a special extension to access
  - Works like a lock and a key – can only turn it just < 360°, if turned more, will break valve and tube will leak

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

Low profile

Mic-Key

- **Advantages:**
  1. Button-type G-tube (skin-level, more discrete under clothing, nothing to pull on)
  2. Easily reinserted once dislodged
- **Disadvantages:**
  1. Balloon can break
  2. Easy dislodgment
  3. More frequent changes
  4. More expensive
  5. Balloon to be checked weekly (more care)

GJ-tube

Surgical J-tube

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

Low profile

Mic-Key

- There are button G-tubes with no balloon (less commonly used at MUMC).
  - Example: **Bard G-tube**

- May last up to **5 years** (average 2 years)
- Replaced in **OR by Pediatric Surgery**

GJ-tube

Surgical J-tube

TYPES OF TUBES

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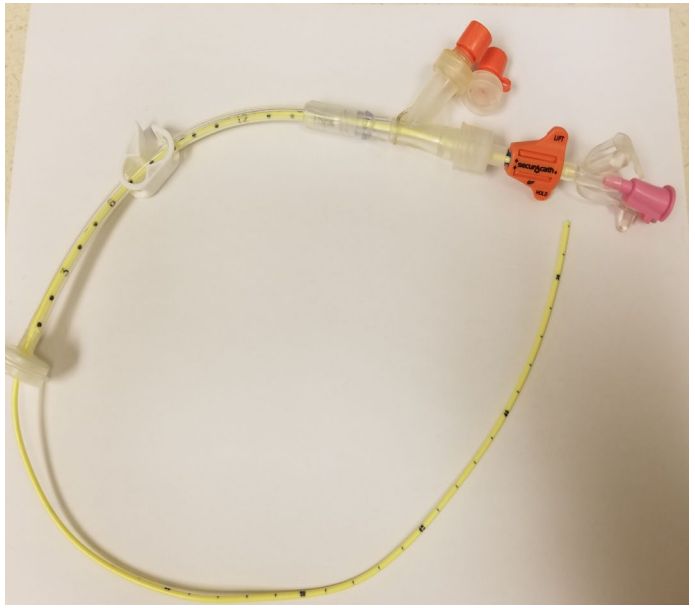
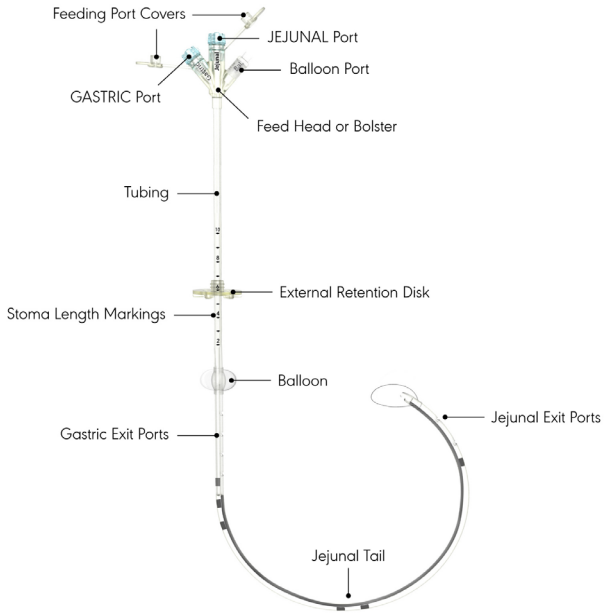
Surgical J-tube





4 ports: G port, J feeding port, J medication port, balloon port

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

Low profile

Mic-Key

GJ-tube

Surgical J-tube

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

Low profile

Mic-Key

- **Common indications:**
  1. Severe GERD
  2. Gastroparesis (slow/poor gastric emptying)
- Placed by **IR** at MUMC
- Has a **disk** to prevent migration into the abdomen
- **Balloon** (similar to G-tube)
- Must run **continuous feeds** over 18-24 hours (aim at avoiding 24 hr continuous feed for ease of care at home)
- **Gastric port uses:**
  1. Some medications
  2. Venting

GJ-tube

Surgical J-tube

TYPES OF TUBES

G-tubes:

High profile

PEG

Mic-G

Foley

Malecot & Pezzer

Low profile

Mic-Key

GJ-tube

Surgical J-tube

- **Disadvantages:**
  1. Easily **blocks** (important to flush before and after use)
  2. Easily **displaces** (important to tape and secure well)
  3. Requires **IR** for insertion and re-insertion
  4. Can cause small-small bowel **intussusception** at the tip of the tube

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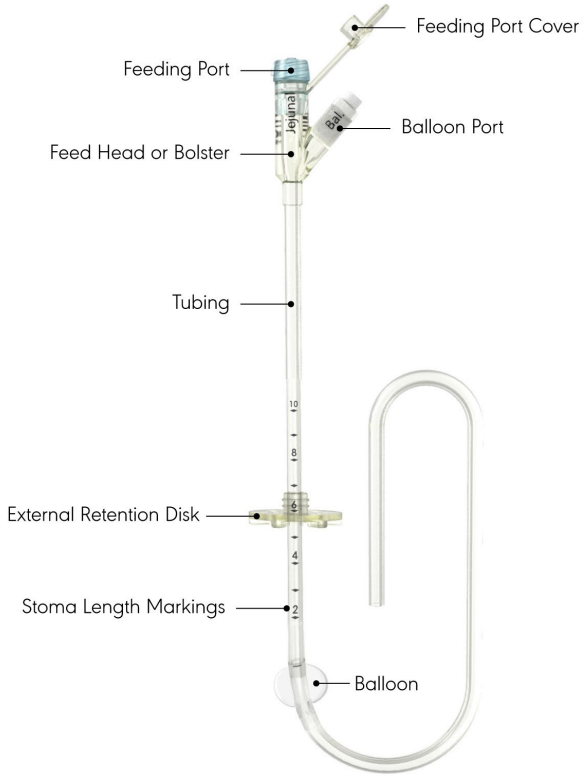
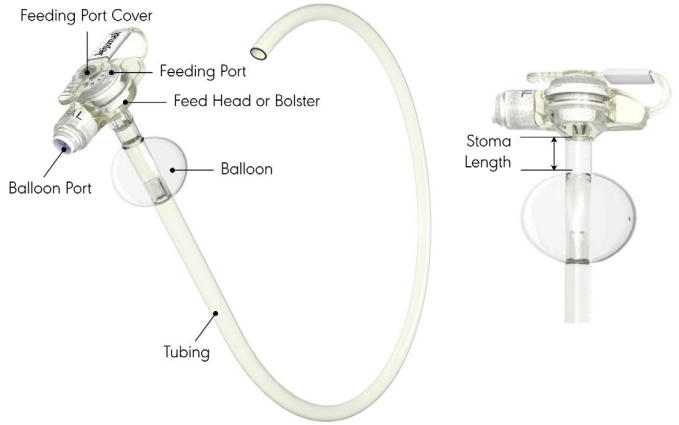
GJ-tube

Surgical J-tube





TYPES OF TUBES

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Low profile

Mic-Key

- **Common indications:**
  1. Severe GERD
  2. Gastroparesis (slow/poor gastric emptying)
- Placed by **Pediatric Surgery in the OR** at MUMC
- Has a **disk** to prevent migration into the abdomen
- **Balloon** in the jejunum
- **No gastric port**
- Must run **continuous feeds** over 18-24 hours (aim at avoiding 24 hr continuous feed for ease of care at home)
- Same **disadvantages** as GJ-tube (less risk of intussusception)

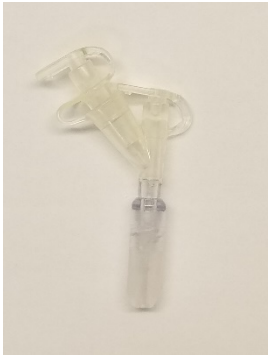
GJ-tube

Surgical J-tube

TYPES OF CONNECTORS

Kangaroo extension

- Changed every 72 hours in hospital
- Changed every 7 days at home



Y-connector

- Can crack and cause tube leakage
- Easily replaced

Mic-Key extension

- Changed every 1 month
- Works like a lock and a key – can only turn it just < 360°, if turned more, will break valve and tube will leak

TUBE PLACEMENT

- **Endoscopic:**
    1. Pull method
    2. Push method
- **Surgical:** Open or laparoscopic
- **Radiologic:** Under fluoroscopy in IR

At MUMC:

- PEG & Mic-G tubes by Pediatric Surgery
- GJ-tube by IR
- Surgical J-tube by Pediatric Surgery

TUBE REPLACEMENT

- **Balloon G-tubes can be easily reinserted:**
  1. Mic-Key
  2. Mic-G
  3. Foley

Equipment:

1. Syringes
   - Two 5 cc syringes: 1 empty & 1 filled with sterile water
   - Two 10 cc syringes: 1 empty & 1 filled with sterile water
2. Proper size tube +/– kangaroo extension
3. Washcloth, towel or gauze
4. Water-soluble lubricant
5. Tape (for Foley and Mic-G) – example: Flexi-Trak
6. pH strips + pH reference guide
7. Instruction card

POST-OPERATIVE CARE

1. Admitted for **~3-4 days**
2. First 6-8 hours post-op → **straight drainage**
3. After 6-8 hours post-op → **clear fluids** (gradually increased to target) → **formula feeds** (usually continuous then switched to bolus or patient's goal feeds) – RD helps guide feeds
4. Daily **site care** while admitted (normal for the site to be slightly red and draining post-op)
5. Parental **training** of the feeding pump/using the tube
6. Meet with **surgical NP** – care, management, and anticipatory guidance
7. D/C with **emergency dislodgement kit** – provided by surgical NP

POST-OPERATIVE G-TUBE CARE

First 6-8 hours post-op → **straight drainage**

DAILY CARE

1. Cleanse with mild soap and warm water OR NS
2. Keep stoma dry
3. Avoid daily use of creams, powders and dressings
4. Check tightness of crossbar/disk/Mic-Key daily to prevent ulcers
5. Turn crossbar/disk/Mic-Key **at least 180° daily**
6. Use dressings only when needed – if fresh tube or stoma draining
7. Change dressings when soiled
8. Assess site for abnormalities
    - Mild redness & drainage are OK in the 1st week post-op

G-TUBE VENTING

Indications:

- Often done **before feeds** to prevent bloating/fullness
- May be done **after feeds** if the child develops symptoms of bloating/fullness

Methods:

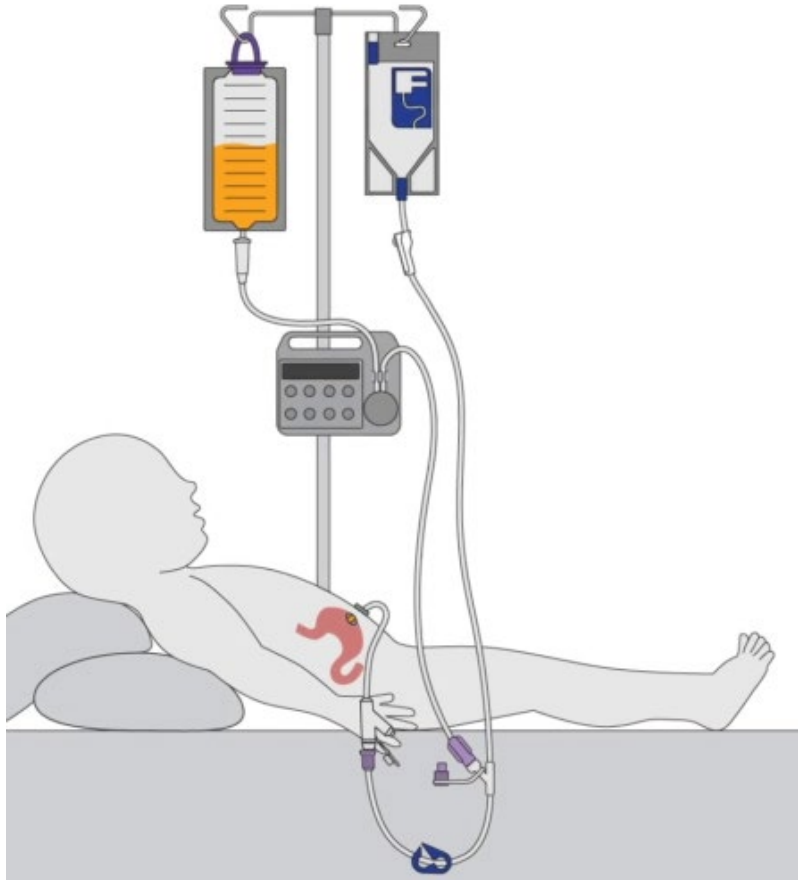
NEVER J

1. Leaving the end of the tube open
2. Using a syringe to vent (without manually venting)
3. Manually venting with a syringe
4. Farrell Valve System

G-TUBE VENTING

Farrell Valve System:

- Closed enteral decompression system
- Intended for continuous gastric pressure relief
- Any nutrition/meds in the Farrell bag→ gravity fed to the patient



FLUSHING OF TUBES

- **To prevent obstruction**
  - 5 mL NS after each feed
  - 5 mL NS after meds
  - If continuous feeds, 5 ml NS Q4-6hr
  - If not in use, 5 ml NS once daily

    - 5 ml is the MIN amount

FLUSHING OF TUBES

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  - 5 mL NS after each feed
  - 5 mL NS after meds
  - If continuous feeds, 5 ml NS Q4-6hr
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MOUTH CARE

- **Oral consequences of tube feeding**
  - Oral stasis produces a shift in oral microflora
  - Manifestations:
    - Atrophic oral mucosa
    - Tartar/calculus accretion
  - Risks:
    - Pneumonia of increased severity with aspirated oral secretions

MOUTH CARE

- If dependent only on tube feeding → after each feed mouth care or Q4hr for continuous feeds

COMMON COMPLICATIONS

Stoma	**Tubbing/connectors**
Leakage	Broken Y-connector
Bleeding	Loose tube
Skin	Dislodgment
Contact dermatitis/irritation	Migration/malposition
Infection (bacterial, fungal)	Buried Bumper Syndrome
Ulceration	Obstruction
Granulation tissue	

STOMA – LEAKAGE

Causes:

1. Increased intra-abdominal pressure:
   - constipation, vomiting, coughing, heavy breathing, ventilation, crying, weight change
2. Improper tube stabilization
3. Tube displacement
4. Poor wound healing
5. Body structure (e.g., scoliosis)
6. Underlying disorder (e.g., slow motility)
7. Positioning

Causes **skin irritation**, **granuloma formation** and **crusting** around the tube

STOMA – BLEEDING

- **Bleeding around the tube:**
  - Small amount of bleeding around the tube can be normal.
  - Large amount of bleeding is NOT NORMAL.

- **Bleeding from the tube:**
  - Any amount is NOT NORMAL and requires emergency treatment.

SKIN – IRRITATION

Causes:

- Leakage of gastric contents
- Overuse of topical agents

Treatment:

- Anti-acid meds
- Barrier products (e.g., Triad, stoma powder, Cavilon spray)
- Stabilize the tube: Correct tube size, balloon inflated, no extensions when not in use, secure the tube to the skin
- May require admission for NPO and IVF until it heals

SKIN – BACTERIAL INFECTION

Clinical features:

- Erythema, gradually spreading
- Tenderness
- Warmth
- Foul, green/purulent discharge
- +/- fever
- Development of furuncle

Causes:

- Staph aureus and GAS are common
- Poor hygiene
- Tension on stoma

Ask about risk factors for MRSA

SKIN – BACTERIAL INFECTION

Diagnosis:

Drainage → send swab Cx if in doubt about MRSA

Ask about risk factors for MRSA

Treatment:

- Antibiotics – Keflex
- Clean with saline QID
- Silver dressings PRN
- Can consult wound nurse

SKIN – FUNGAL INFECTION

Symptoms:

Red, popular rash, often with satellite lesions

Causes:

- Moisture
- Hot, humid environment
- G-tube deep in skin fold
- Immuno-suppression

Treatment:

1. Dry + clean skin
2. Nystatin powder + Proshield

SKIN – ULCERATION

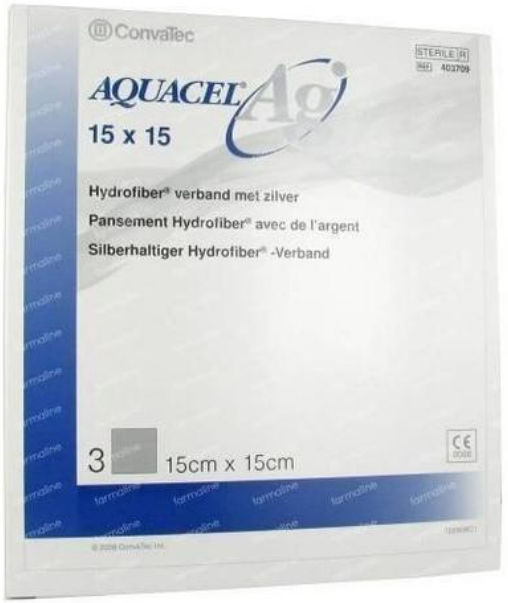
Usually seen in the first few days/weeks post-op

Causes:

- Cross-bar/disk too tight on stoma
- Mic-key too tight on stoma

Treatment:

- Loosen cross-bar
- Change Mic-key
- Apply **Aquacel Silver** dressing; change daily (can keep on for 3 days but good to examine skin daily)



SKIN – GRANULATION TISSUE

Causes:

- Body trying to heal
- Loose tube
- Excessive moisture/occlusive dressings

Clinical features:

- Pink-red, cauliflower-like, beefy tissue
- Grows around tube
- Friable – easily bleeds
- Drainage – yellow and/or brown
- May be painful

SKIN – GRANULATION TISSUE

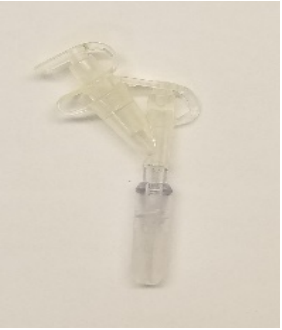
Treatment:

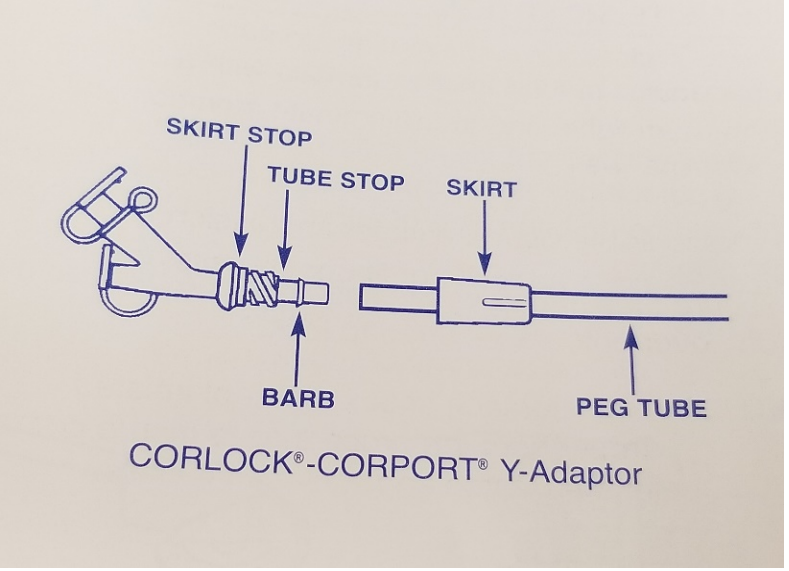
1. Saline soaks QID x5min
2. Silver nitrate sticks q2-3 days (may cause burning sensation)
3. Stabilize the tube, change the size of Mic-Key, do NOT leave extensions on when not in use
4. Barrier powder (stoma powder) – moisture control
5. Flovent 50 mcg 1 puff BID

TUBE – BROKEN Y-CONNECTOR

Replacement instructions:

- Remove old Y-connector:
  - Untwist skirt from Y-connector
  - Pull connector out of PEG tube
  - Remove old skirt
- Insert new skirt over PEG tube; may need to cut fresh end on PEG (cut small amount from PEG tube if necessary)
- Push PEG tube onto end of Y-connector until tube stop is reached
- Twist and push skirt on until skirt stop is reached





TUBE – LOOSE TUBE

Clinical features: Leakage

Treatment:

- Tighten cross bar if loose (PEG tube)
- Add more sterile water to the balloon (Mic-Key or Mic-G tubes)
  - 3 mL if < 1 year old
  - 5 mL if > 1 year old

TUBE – DISLODGEMENT

Causes:

- Balloon deflates
- Accidentally gets pulled out

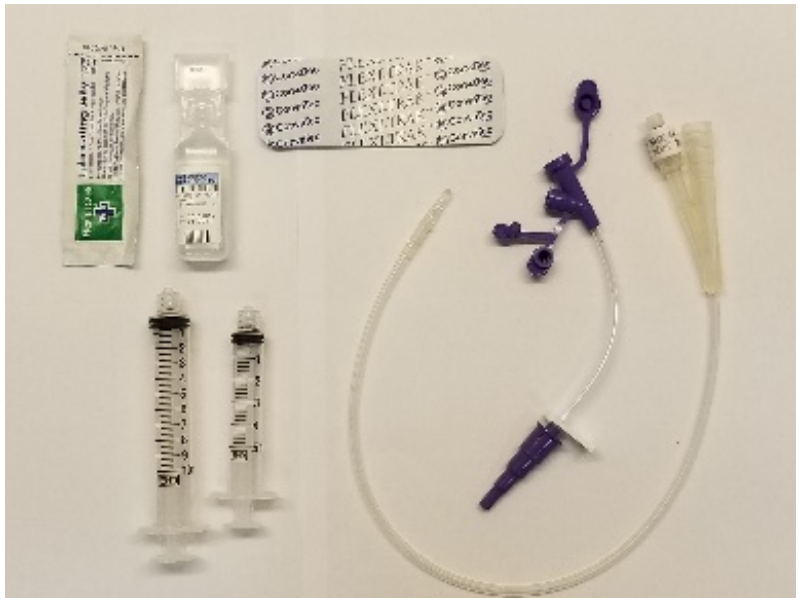
Stomas can start to close in < 1 hour!

Treatment:

Early (placed < 12 weeks): Cover the stoma with a gauze and come to ER, risk of peritonitis, needs a tube contrast study

Late (placed > 12 weeks): Place a Foley's catheter (provided in the emergency dislodgement kit), inflate the balloon, restart feeds after aspirating gastric contents, call the surgeon or surgical NP in case of difficulties and to arrange tube insertion

TUBE – DISLODGEMENT



PLUS washcloth/towel/gauze, pH strips + pH reference guide, instruction card

McMaster Children's Hospital

Emergency kit: Replacing a dislodged g-tube

Redraft – May 14/15

Always have your emergency kit readily available in case the g-tube becomes dislodged. Ensure that it is always with your child, even when he or she leaves the home.

The supplies you need include:

- 2 foley catheters, (one the same size as your child's g-tube,and one a size smaller)
- Kangaroo extension set
- Water-soluble lubricant
- 5-cc and 10-cc syringe
- Medical tape or flexi-track
- Sterile or distilled water
- Instruction card

Follow these instructions ONLY if:

✓ **It has been MORE than 3 months since the g-tube was first inserted**

If it has been LESS than 3 months, cover the opening with gauze or a clean cloth. Call the clinic nurse. If you cannot reach the nurse within 30 minutes, come to McMaster Children's Hospital's Emergency Department. Bring your emergency kit and the dislodged g-tube with you.

✓ **You feel comfortable doing this**

Date tube inserted: _____ **Date able to use kit:** _____

Instructions (Use the foley catheter that is the same-size as your child's g-tube)

1. Wash your hands with soap and water.
2. Seek help of another person to help hold your child, if needed.
3. Attach the kangaroo extension to the open end of the catheter.
4. Fill the 5-cc syringe with 5 cc of sterile water (3 cc for babies less than 1 year).
5. Lubricate the tip of the catheter with the water-soluble lubricant.
6. Insert the catheter 2.5 to 3 inches into the opening. Do NOT force the catheter into the stoma.
7. Connect the 5-cc syringe filled with sterile water to the balloon port of the catheter. Inflate the balloon with water (use 3 cc for babies less than 1 year). Hold down the plunger of the syringe, twist and pull off.
8. Gently pull up on the catheter until you feel resistance. Secure the catheter to the abdomen with tape or the flexi-track. Use a marker to make a mark on the catheter exactly where the tube exits your child's stomach. This will help you know if the catheter moves.
9. Check the placement of the catheter by attaching the 10-cc syringe to a port on the kangaroo extension. Gently pull back on the syringe until you see stomach contents (formula, mucous, green drainage). Seeing stomach contents confirms that you are in the stomach.
10. Flush the Kangaroo extension with 10 to 15 cc of warm water (5 to 10 cc for babies).
11. You are now able to use the tube for feeding or giving medication.

Call the Clinic Nurse Practitioner, Julia Yole at 905-521-2100 ext. 73618 if you have any questions or concerns, and to schedule a tube change.

TUBE – MIGRATION/MALPOSITION

Clinical features:

- Vomiting → Balloon obstructing the duodenum
- Diarrhea → Gastrocolocutaneous fistula – contrast study required
- Pain/inability to flush tube → Buried Bumper Syndrome
  - Incidence: 1.5-2.4%
  - Days to years after placement
  - Needs urgent surgical consultation

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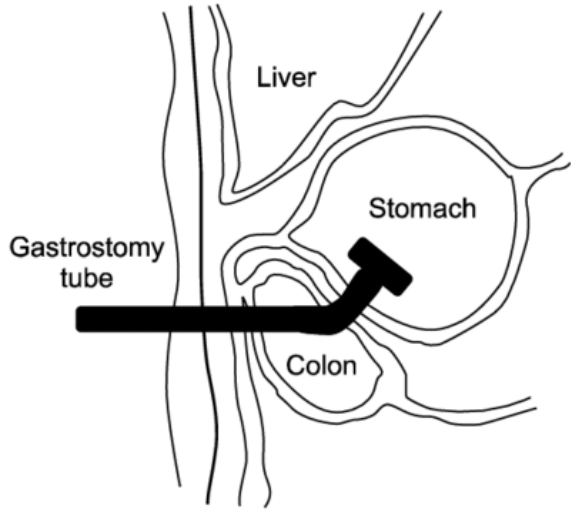

TUBE – MIGRATION/MALPOSITION

Clinical features:

- Vomiting → Balloon obstructing the duodenum
- Diarrhea → Gastrocolocutaneous fistula – contrast study required
- **Pain/inability to flush the tube → Buried Bumper Syndrome**
  - Incidence: 1.5-2.4%
  - Days to years after placement
  - Diagnosis: Upper GI endoscopy or CT
  - Needs urgent surgical consultation

TUBE – MIGRATION/MALPOSITION

Treatment:

- Measure the length of the tube from the skin outwards
  - May need to be pulled back
- Secure the tube to the skin (e.g., Flexi-Trak)
- Check tube placement
  - May require contrast study, especially with diarrhea
  - May require upper GI endoscopy or CT, especially with pain/inability to flush the tube
- Complications require surgical consultation

TUBE – OBSTRUCTION

Causes:

- Thick liquid medications (e.g., Nexium)
- Pill fragments
- Thick liquid diets/formulas
- Failure to flush
- Defective tubing
- GJ or surgical J tubes

TUBE – OBSTRUCTION

Prevention:

- Flush after each feed/medication
- Ensure only water, juice, electrolyte solutions, thin liquid diets/formulas and thin liquid medications are given
  - Caution with blenderized diets

TUBE – OBSTRUCTION

Treatment:

- Check for kinks; make sure clamp is open
- Change extension
- Milk tubing
- Syringe method
- Enzyme method
- May need tube replacement

McMaster Children's Hospital

Procedure for Unblocking Occluded Feeding Tubes

Various practices have been employed for unblocking occluded feeding tubes, whether it be due to medication or enteral feeds. Flushing the tube before and after medication administration with water can help to prevent clogging from occurring. A variety of other fluids, including cola or cranberry juice, have been used for unblocking occluded tubes. However, these products are acidic and may actually contribute to the problem. To date, water has been shown to be the best flush solution. A combination of sodium bicarbonate and pancrelipase capsules have also been employed with success as described below.

1. Using a 20-60 mL syringe, aspirate as much liquid as possible from the feeding tube and discard the fluid.
2. Instill 5-10 mL warm water with the same syringe under manual pressure over one minute and use a back and forth motion to help dissolve the blockage.
3. Clamp tube for 5-15 minutes.
4. Attempt to aspirate and flush with warm water.
5. You may need to clamp the tube a few times to allow the blockage to break up.
6. If tube is still occluded, repeats steps 2 to 4 using the following mixture:
   a. 1 x Sodium bicarbonate 500mg tab, crushed
   b. 1 x Cotazym® (pancreatic enzymes), empty powder-filled capsule
   c. 10 mL of warm water
7. Take care not to flush this enzyme solution through the tube once the blockage breaks up. Aspirate the blockage and the enzyme solution and discard.
8. Flush the tube with 5 mL (*for patients less than 1 year of age*) or 10mL (*for patients greater than 1 year of age or patients with G-J tubes*) of warm water.

"Blocked Feeding Tube Kits" containing Sodium bicarbonate 500mg and Cotazym® (pancrelipase) capsules are available in Acudoses

Original reference: Pharmacy Connection, The Ontario College of Pharmacists, Vol 8, No 6, Nov/Dec 2001

Original - Patty McEwen, 3C Pharmacist - July 2004
Reviewed - Stephanie Carlin, 3C Pharmacist - Sept 2011
Updated - Leanne Patel, ED Pharmacist / Julia Yole, Surgery NP – August 2019

TUBE – OBSTRUCTION

Treatment:

- Syringe method:
  - 20-60 mL syringe
  - Aspirate as much liquid as possible from the tube and discard the fluid
  - Instill 5-10 mL warm water/carbonated drink under manual pressure over one minute, using a back and forth motion
  - Clamp tube for 5-15 minutes
  - Attempt to aspirate and flush with warm water/carbonated drink
  - You may need repeat a few times

TUBE – OBSTRUCTION

Treatment:

- Enzyme method:
  - Same steps as the syringe method
  - Enzyme mixture:
    1. **1 x Sodium bicarbonate 500 mg tab, crushed**
    2. **1 x Cotazym (pancreatic enzymes), empty powder-filled capsule**
    3. **10 mL of warm water**
  - Don't flush the enzyme solution through the tube once the blockage breaks up
  - Aspirate the blockage and the enzyme solution and discard
  - Flush the tube with 5 mL (<1 year) or 10 mL (>1 year or GJ) of warm water

Thank You!

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