



The Ins and Outs of Enteral Nutrition-Tube Feeding Basics

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Objectives

- Provide practical insight on decisions guiding formula choice, considerations in method of feeding, understanding complications and delivery of care and instruction to patients with feeding tubes.
- Discuss types of gastrostomy tubes, contraindications to the placement of feeding tubes as well as mechanical complications after placement
- Review feeding tube maintenance, water flushes, medication administration and preventative care



Indications for Enteral Nutrition

- A.S.P.E.N. recommendations:
- Patients undergoing anticancer therapies who are malnourished and anticipated to be unable to ingest adequate nutrition for a prolonged period of time.
- Patients who are moderately to severely malnourished beginning 7-14 days preoperatively weighing the risks of nutrition support and delay of surgery are weighed against the benefits



Disease-Specific Indications for Enteral Nutrition

- Head and Neck Cancer
- Esophageal Cancer
- Gastric Cancer
- Pancreatic Cancer





Selecting an Enteral Formula

- **Standard, polymeric:** Intact nutrients
- **Elemental or semi-elemental:** Partially or completely hydrolyzed protein and altered fats
- **Blenderized:** Mixture of blenderized food sources
- **Disease-specific :** Used for patients with organ dysfunction or specific metabolic needs ie short bowel syndrome, malabsorption or pancreatic exocrine insufficiency.
- **Modular:** Addition of CHO, protein, fiber to enhance nutrient content of formula or diet



Immunonutrition in GI Surgical Oncology

- Preoperative immunonutrition
- Perioperative
- Recommendations for malnourished GI surgical patients
- 5-7 days pre and postoperatively
- Limitations
- Dose
- Timing
- Cost?
- Need further studies to understand individual nutrients

August DA, Huhmann MB. JPEN. 2009; 33: 472-500
Support Line. 2010; 32: 8-13



EAL: Oncology Evidence-based Nutrition Practice Guidelines

- **Oncology (Onc) Head and Neck Cancer: Surgery and Use of EPA-Enhanced Medical Food Supplement**
- If the use of an EPA-enhanced MFS is proposed to decrease post-surgical complications (e.g., infections and weight loss) for oral and laryngeal cancer patients, advise inadequate evidence exists to show a benefit.

Weak

Conditional

Accessed www.Anevidencelibrary.com



EAL: Oncology Evidence-based Nutrition Practice Guidelines

- ***Surgery***
- **Oncology (Onc) Head and Neck Cancer: Surgery and Use of Arginine-Enhanced Medical Food Supplement or EN**
- **Onc-Head and neck cancer: Post-operative use of arginine**
- **Post-operative** use of arginine-enhanced medical food supplements (MFS) or enteral nutrition (EN) to improve outcomes for patients with head and neck cancer is not recommended.

Fair

Imperative

- **Onc-Head and neck cancer: Pre-operative use of arginine**
- **Pre-operative** use of arginine-enhanced EN to improve outcomes for patients with head and neck cancer is not recommended.

Fair

Imperative

• Accessed www.Anevidencelibrary.com



Does the patient have...

- Digestive and absorptive capabilities intact?
- Significant organ dysfunction and how is it being managed?
- Increased metabolic requirements?
- Is the patient malnourished?
- Contraindication to any of the formula components?
- Fluid restriction or increased fluid needs?
- Insurance coverage for the desired formula? If so, what documentation is required?
- Insurance that will not cover the formula, or will cover only a portion of the cost?



Insurance Considerations-Medicare

- Is the patient's medical condition one that requires the tube feedings for 90 days or longer?
- Is adequate nutrition possible by diet modification and/or oral supplements?
- Is the enteral product administered through a feeding tube?
- Will the patient require daily enteral intake of 750-2,000 calories from tube feedings?
 - *If NO, staff must obtain documentation from the prescribing physician or RD for justification of calories/day outside of the 750-2000 kcal/day range.*
- Is the patient's condition a result of an anatomic dysfunction (i.e., obstruction due to head/neck cancer or reconstructive surgery, etc.) OR due to motility disorder (i.e., severe dysphagia due to stroke, gastroparesis, malabsorption, etc)?
 - YES List qualifying diagnosis / condition
 - *Include supporting documentation*
 - No *If NO, coverage will be denied*

Know who to talk with and cover all bases with documentation



Other Insurance Considerations

- Medicaid
- Medicaid pending
- Oral supplementation
- Private insurers
- May dictate formula choice
- May specify home care vendor
- Medical supply coverage may not include formula
- May not cover anything-then what?
 - Oley Foundation
 - Donated product



Home Blended Formulas

- Nutritionally adequate?
- Care Provider support and time at home?
- Food safety considerations
- Blender or food processor
- Volume matters-Calorically dense?
- Fluid estimation
- Insurance provision of supplies



Delivery Methods-What is the best method for your patient?

- Continuous infusion
- Cyclic feeding
- Intermittent feeding
- Bolus or gravity drip feeding
- Transitional feeding
- Insurance considerations





Initiation and Advancement

- Use within 1-4 hours after placement
- Full strength –avoid dilution
- Initiate at 20-50mL/h and increased by 10-25mL/hr every 4-24 hours.
- Intermittent feedings (infusion pump or gravity drip) at 240-720mL over 20-60 minutes provided 4-6 times a day
- Bolus or gravity drip 240mL over 4-10 minutes infused 3-6 times a day



Complications of Enteral Nutrition-why blame the formula?

- Formula tolerance often associated with
- severity of illness
- comorbid conditions
- Enteric pathogens
- Concomitant use of medications administered through the enteral access device



...Why blame the formula?

- Gastrointestinal Complications
 - Nausea and Vomiting
 - Abdominal Distention
 - Maldigestion vs malabsorption
 - Diarrhea
 - Bacterial overgrowth of the intestinal tract
 - Contamination of the enteral feeding formula
 - GI Diseases
 - Constipation
- Metabolic
 - Electrolyte imbalance
 - Hyperglycemia
- Dehydration
- Aspiration



Diarrhea

- Etiologies
 - Drug induced
 - Hyertonic feeding
 - Lactose intolerance

- Management



Transition to Oral Intake

- Once patient is consuming 50% of needs orally, tube feeding can be decreased
- Nocturnal or cyclic (8-12 hours) tube feedings are encouraged during transition feedings
- Tube feedings discontinued when patient is meeting 75% of nutrition needs orally.
- Feeding tube removed if patient maintains weight over 2-3 weeks without use of tube



Building a Team

- Who places the order?
- Templates for recommendations and orders- where does this live in the chart?
- Who teaches care of tube?
- Who teaches method of feeding?
- What patient education materials are used in GI, IR, inpatient, outpatient?
- Is there communication between inpatient and outpatient team?
- Who does the patient call for help?



BELLY UP!

Management of Feeding Tubes

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1) Gastrostomy Tubes (GT)

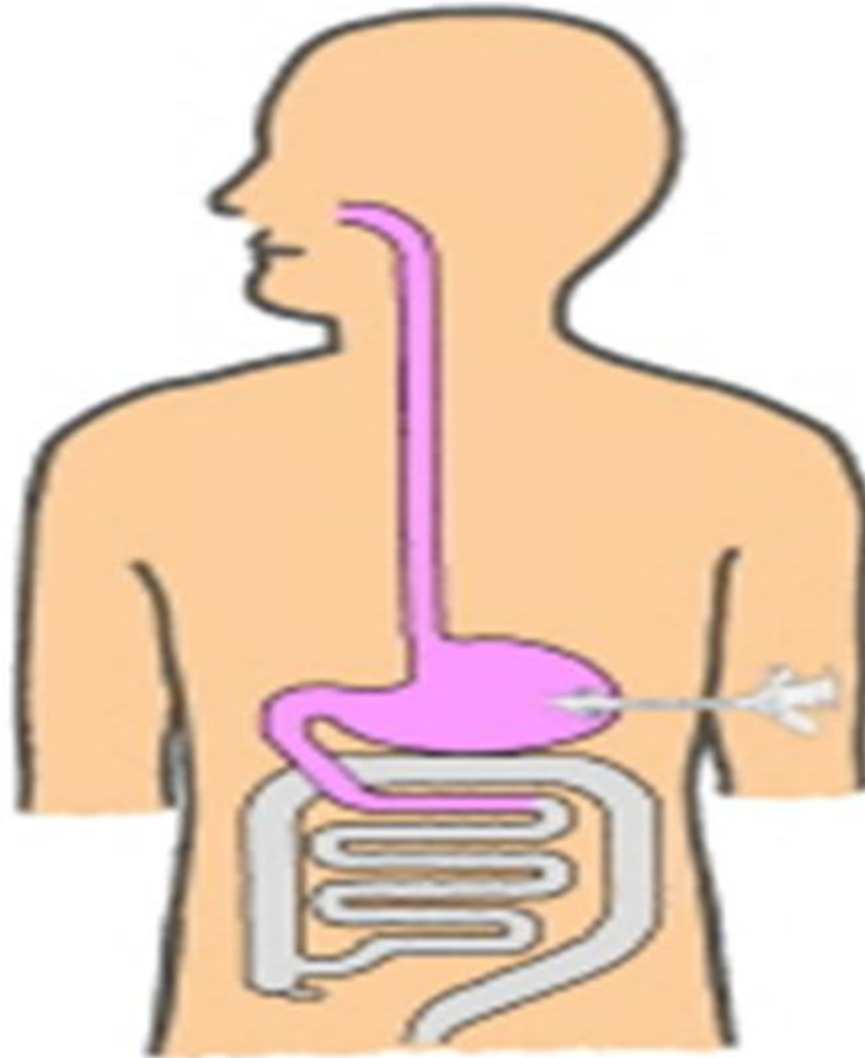
2) Gastrojejunostomy Tubes (GJ)

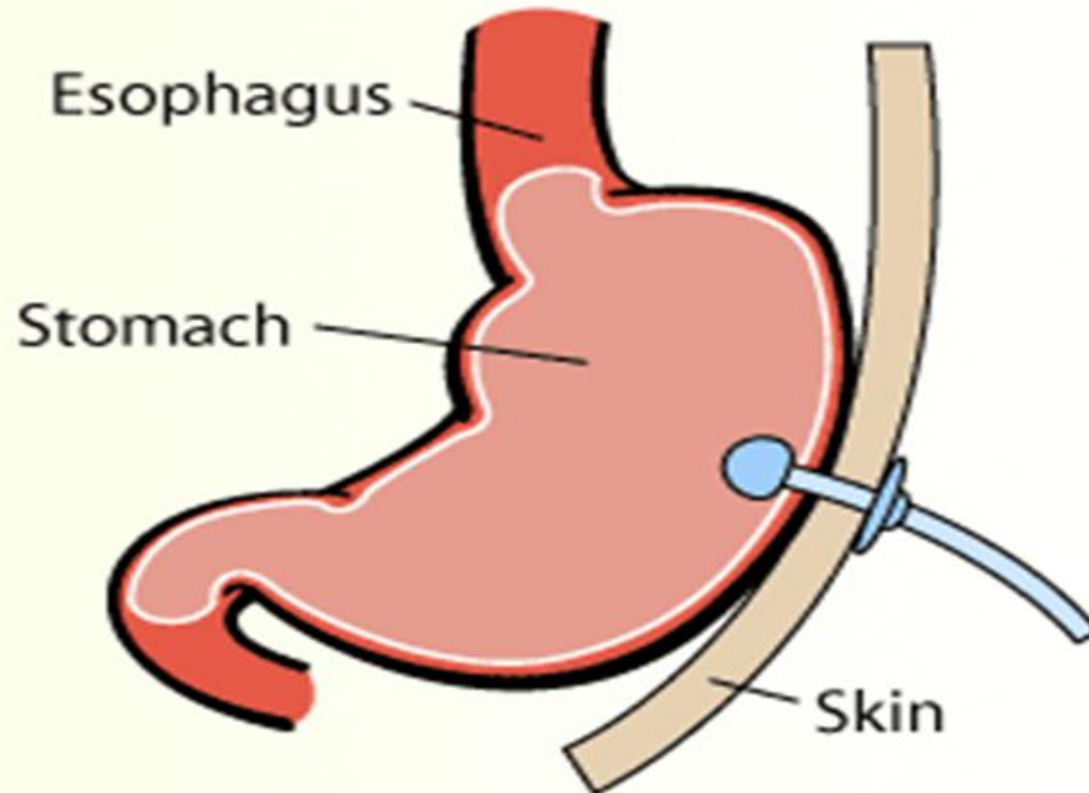
3) Jejunostomy Tubes (JT)



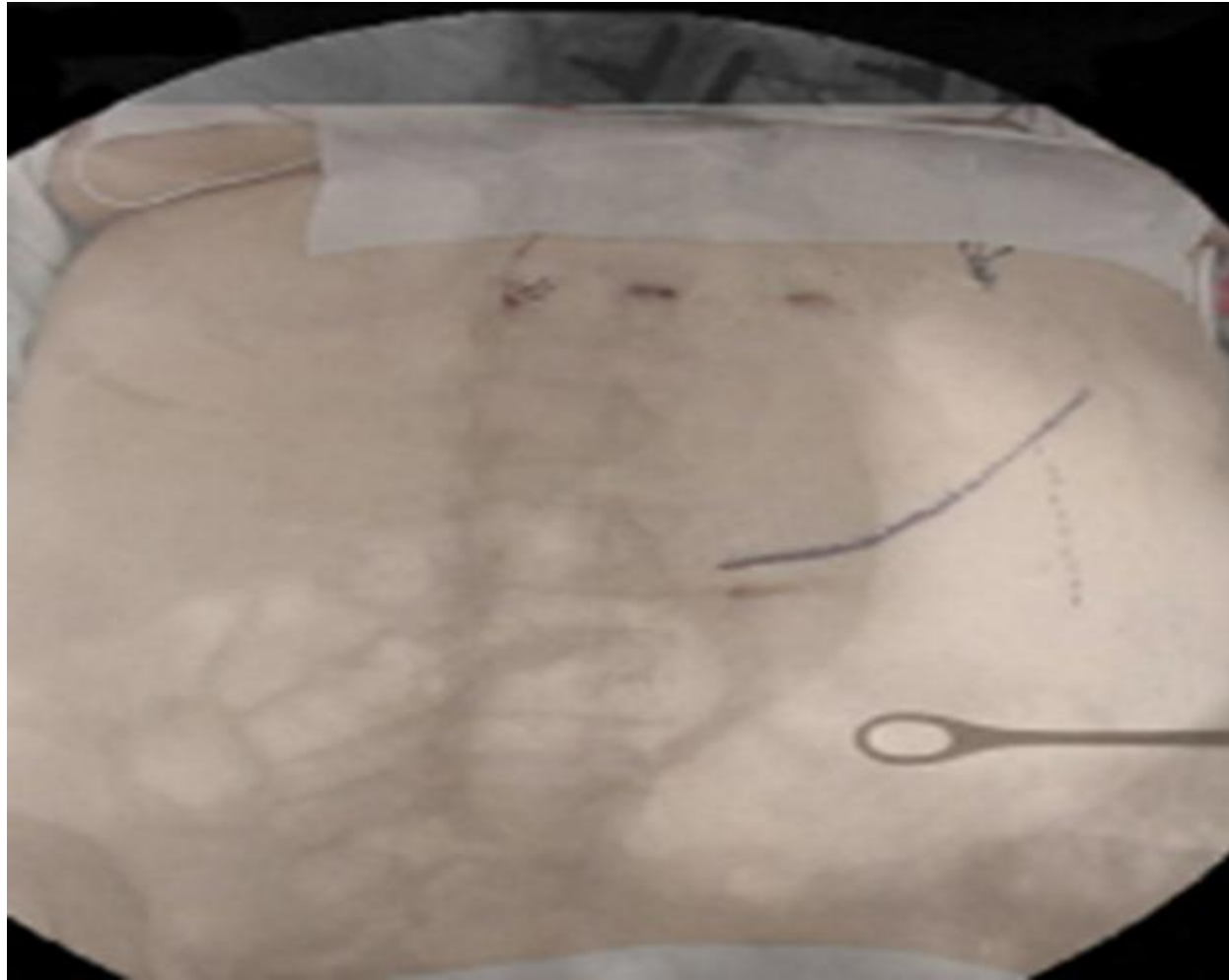
Gastrostomy Tubes

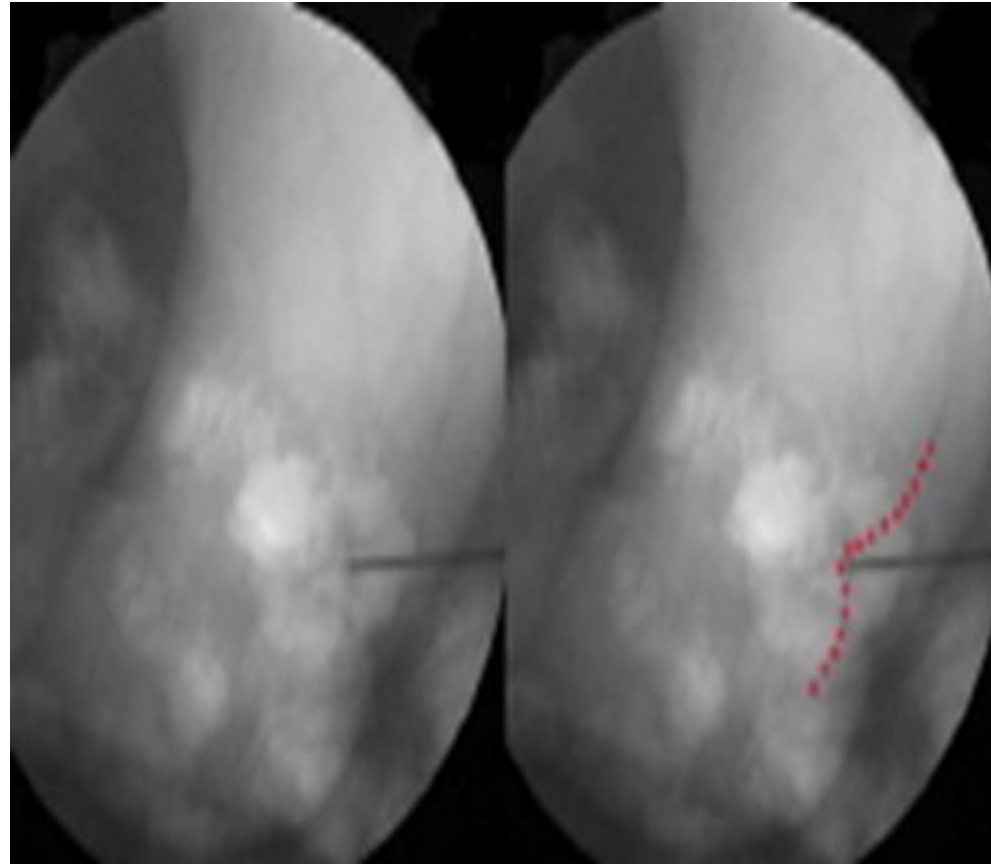
- GTs are placed percutaneously (IR), endoscopically (aka PEG) and surgically.
- GTs are used for feeding, as well as decompression for patient with intestinal blockage.
- When patient has a GJ tube, the gastric portion is best for delivering medications.





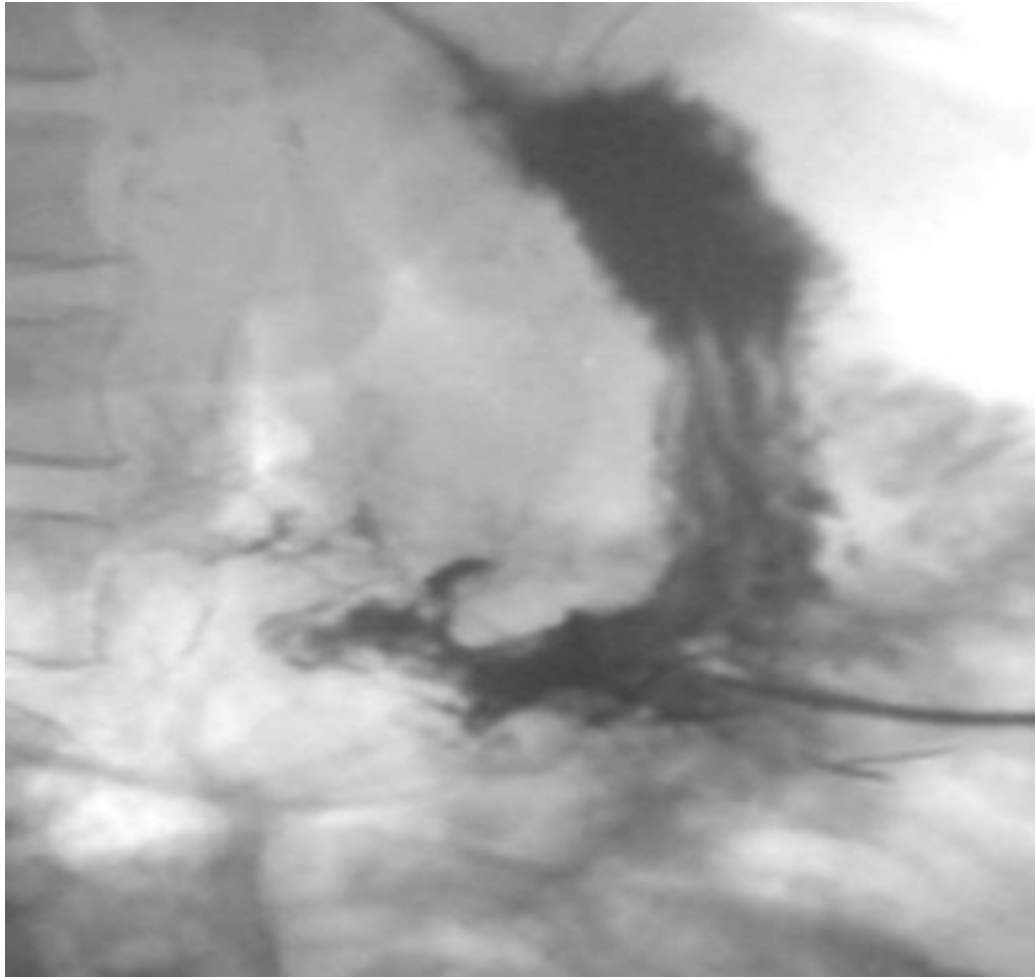
Gastrostomy Tube Placement

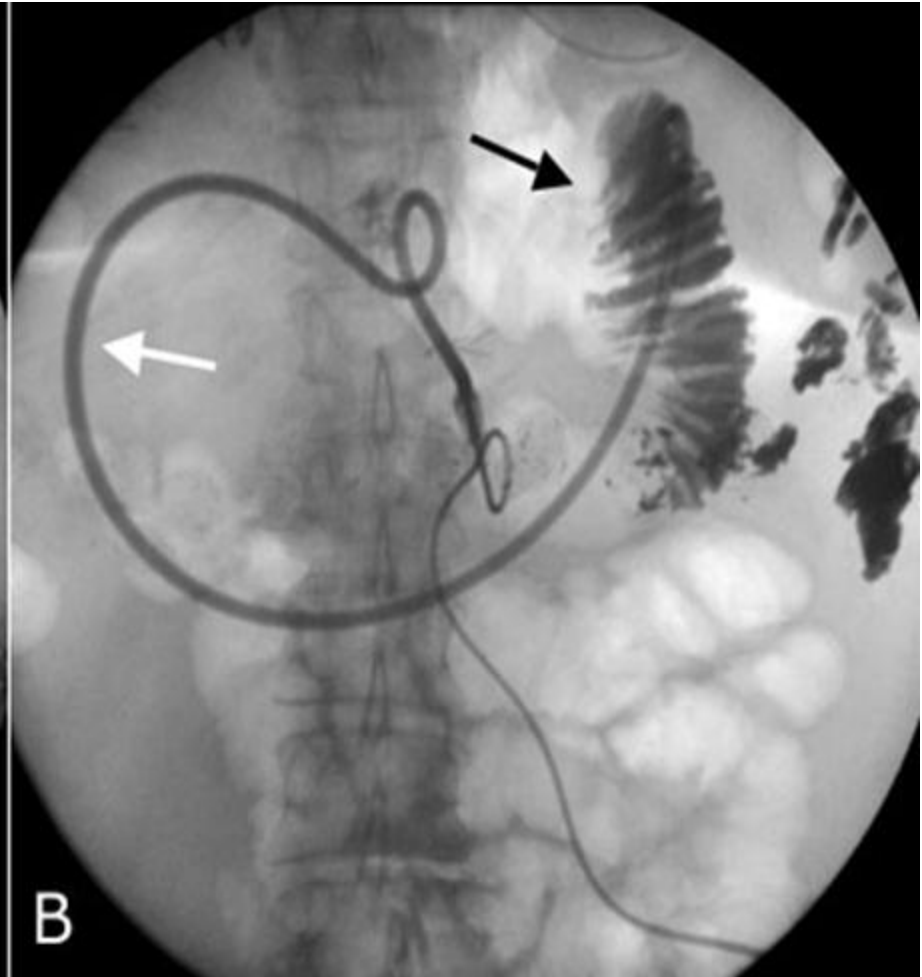
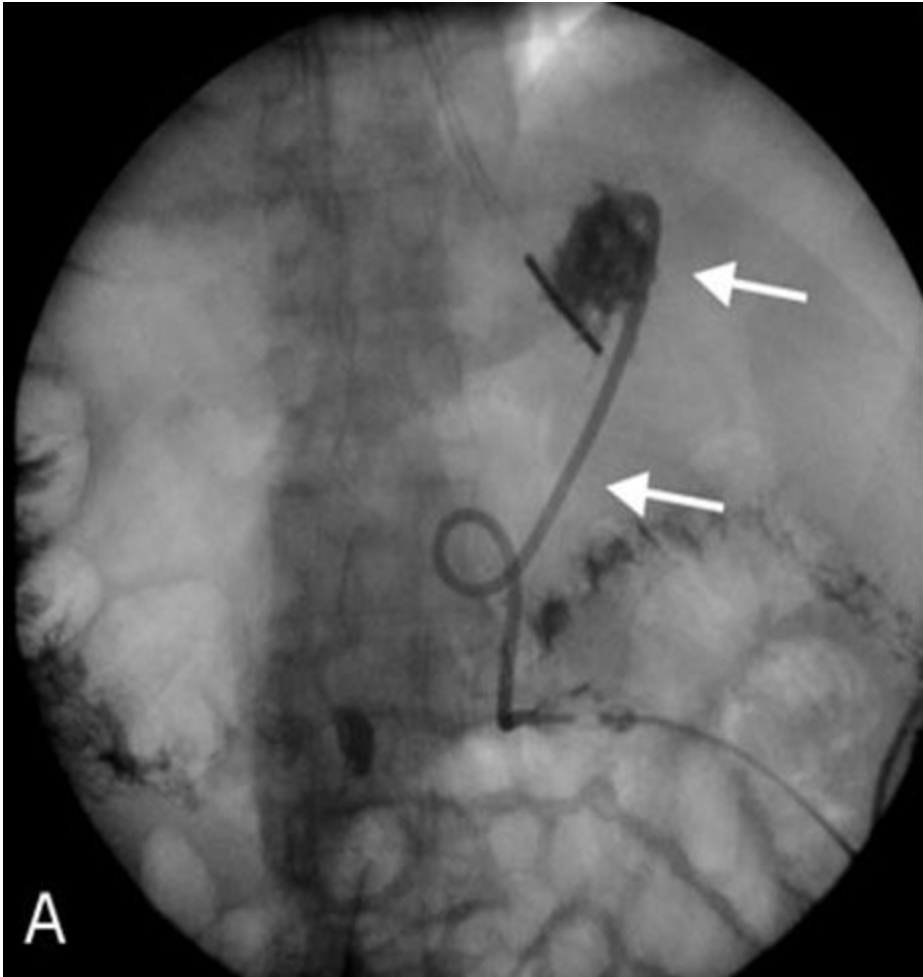






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What Do You Mean *NO*?

Contraindications to feeding tubes

- *Interposition of colon and or liver between stomach and anterior abdominal wall
- *Intrathoracic position of stomach
- *Previous gastrectomy
- *Massive ascites (relative..can do LVP first)
- *Gastric malignancy(consider surgical placed) or varices



Contraindications to Enteral Nutrition

- Nonoperative mechanical GI obstruction
- Intractable vomiting and diarrhea refractory to medical management
- Severe short bowel syndrome (<100cm small bowel remaining)
- Paralytic ileus
- Severe GI bleeding
- Severe GI malabsorption (failed EN)
- Inability to gain access to GI tract
- Distal high-output fistulas (too distal to bypass with feeding tube)
- Intestinal ischemia
- Need is expected for less than 5-7 days for malnourished adult patients or 7-9 days if adequately nourished
- Prognosis not consistent with aggressive nutrition



Candidates for Surgically Placed (Open or Laparoscopic) Feeding Tubes

- Obstructing tumors of the upper GI Tract
- Previous upper abdominal surgery
- Inaccessible stomach due to high location
- Hepatomegaly
- Coverage by the transverse colon
- Complications include emesis, high residual volumes, diarrhea, ileus, nausea, pain at the site, and increased morbidity and mortality (compared to PEG)



Gastrojejunostomy and Direct Jejunostomy tubes

- Tube management identical to GTs
- If patient has a GJ, use the “G” portion for all medications, and the “J” portion for feeds
- If patient has a JT, but is not swallowing medications, ensure the medications are adequately crushed/diluted. When possible, have Provider order medications in liquid form.



If patient has a Foley catheter in the small bowel being used as a feeding tube, DO NOT INFLATE THE BALLOON. This will lead to intestinal blockage.



What Could *POSSIBLY* Go Wrong?

- Cellulitis
 - *Procedural
 - *Leaking gastric contents
- Leaking
 - *Expansion of tube entry site r/t excessive external motion
- Peritonitis
- Occlusion
- Malposition



.....*POSSIBLY* Go Wrong?

- Aspiration
- Gastric Outlet Obstruction
 - *antegrade migration of balloon GT
- Tube dislodgement
 - *tracts usually mature in ~2 weeks
 - *RRC/Foley; then call IR! If tract is “mature”, may not need placement confirmation
 - *consider larger tube, or balloon-retained tube
- Tumor Seeding



Other causes of feeding tube issues

- *Incomplete flushing
 - -clogging
- *Bulking agents
 - -clogging
- *Yeast
 - -clogging
- *Malposition
 - -leak, vomiting (also=TF rate too high)
- *Balloon
 - -under/overinflated, or not snug against stomach wall
- *Tube is kinked within bowel



Tube feeding maintenance

- ~GTs should be flushed with at **least** *30ml* water before and after tube feeds, every 4 hours **during** feeds, and before and after medication administration. Manual flush, not via tube
- ~**Use clear, white, sugar free solutions such as water, seltzer water and DIET Ginger Ale. NO COCA COLA!!! Acidic fluids will promote clogging.**
- ~If flushing becomes difficult, contact Provider to head off complete occlusion. Use small syringes to help resolve partial occlusion.
- **DO NOT FORCEFULLY FLUSH=RUPTURE**
- ~ Use soap and water to cleanse peritubal area. NO Hydrogen Peroxide.
- *this amount may vary between providers*



A.S.P.E.N. Enteral Nutrition Practice Recommendations: Related to Water

- EN Administration: flushes
- Flush feeding tube with 30ml water every four hours during continuous and before/after intermittent feedings
- Sterile water for tube flushes in immune compromised or critically ill or infants
- Water and EN formula safety
- Use a purified water or sterile water supply for formula reconstitution and medication dilution



Medication Administration

- “Grind simple compressed tablets to a fine powder and mix with sterile water. Open hard gelatin capsules and mix powder with sterile water”
- Flush tube with at least 15 ml water. Dilute solid or liquid medications as needed and administer. Flush tube with at least 15 ml water.



Patient Resources

- Oley Foundation www.oley.org
- SPOHNC www.spohnc.org
- Seattle's Children Hospital for making home made blenderized formulas
- University of Virginia Health System:
www.GInutrition.virginia.edu
- Vitamixer www.vitamix.com
- Lucy's home made formulas
www.lucyrealfood.com



Professional Resources

- A.S.P.E.N. www.nutritioncare.org and The A.S.P.E.N. Adult Nutrition Support Core Curriculum 2nd Edition
- Dietitians in Nutrition Support www.dnsdpg.org
- Huhmann MB, August DA, **Review of American Society for Parenteral and Enteral Nutrition (ASPEN) Clinical Guidelines for Nutrition Support in Cancer Patients: nutrition screening and assessment.** Nut Clin Prac. 2008 Apr-May;23(2):182-8
- August DA, Huhmann MB, American Society for Parenteral and Enteral Nutrition(ASPEN) Board of Directors. **ASPEN clinical guidelines: nutrition support therapy during adult and anticancer treatment and in hematopoietic cell transportation.** JPEN J Parenter Enteral Nutr. 2009; 33: 472-500
- **Evidence Analysis Library : www.andevidencelibrary.com**
- **The Complete Resource Kit for Oncology Nutrition**
- Templates for Home EN
- **Oncology Evidence-Based Practice Toolkit (Electronic format)**
- Feeding Tube Use and Care
 - Bolus/Syringe Feedings
 - Gravity Tube Feedings
 - Pump Feedings