Gastric vs. Jejunal Feeding Tube: Why the Distinction Matters

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Disclosure

Michael Liu has no actual financial interest/arrangement or other potential conflict of interest associated with the presentation.

Learning Objectives

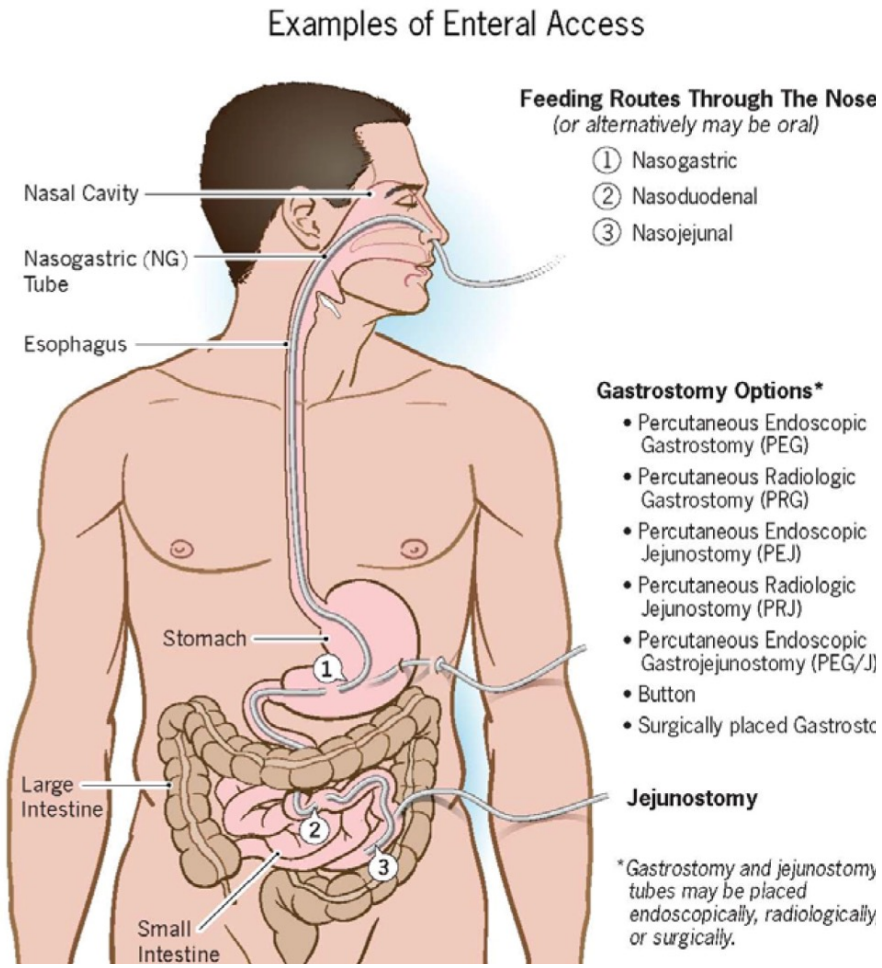
Pharmacists:

- Describe the indication for the different enteral administration routes
- Explain why certain medications and types of enteral nutrition that should not be administer via the jejunal routes

Pharmacy Technicians:

- Identify the different enteral administration routes
- List certain medications and types of enteral nutrition that should not be administer via the jejunal routes

Enteral Feeding Tubes



Gohel TD, Kirby DF (2016) Access and Complications of Enteral Nutrition Support for Critically Ill Patients. In: Seres D., Van Way, III C. (eds) Nutrition Support for the Critically Ill. Nutrition and Health. Humana Press, Cham.

Post-pyloric Feeding Medication Considerations

- Render ineffective: sucralfate, antacids, bismuth
  - Sodium bicarbonate and citrate may be use for RTA
  - Bismuth may be use for *H. pylori* and traveler's diarrhea by *E. coli*
- ↓ absorption of drugs that are primarily absorbed in the stomach and duodenum:
  - Rivaroxaban (AUC ↓ by 29-56% in duodenum)
  - Ciprofloxacin (AUC ↓ by 40-63% in jejunum)
- ↓ absorption drugs that required prolonged acid dissolution:
  - Carbamazepine (AUC ↓ by ~31% post-pyloric)
  - Itraconazole
  - Tetracycline

Types of Enteral Feeding Formulas

- Polymeric
  - Balanced macronutrients and micronutrients
  - For normal digestive capability
  - May be consume orally
- Specialty
  - Balanced but altered ratios of macronutrients and micronutrients
  - For normal digestive capability and specific-disease states
  - May be consume orally

Types of Enteral Feeding Formulas

- Oligomeric/Elemental
  - Balanced macronutrients and micronutrients
  - Predigested: for normal* or impaired digestive capability (e.g., impaired or bypass pancreatic enzymes)
  - Poor palatability: rarely consumed orally
  - FYI: semi-elemental: partially pre-digested

  *Most expensive type of EN, therefore not recommended in normal digestive capability
- Modular
  - A single macronutrient
  - For enhancement; must use with polymeric, elemental, or specialty
  - For normal or impaired digestive capability
  - May be consume orally

Cost of Elemental and Semi-Elemental

Table 1
Cost Comparison of Elemental and Standard Formulas

Product	*Company*	*Cost $/1000 kcal*+*	*Product*	*Company*	*Cost $/1000 kcal*+*
Elemental /Semi-elemental			*Standard, Polymeric*		
AlitraQ (E)	Ross	29.17	Fibersource HN	Novartis	3.73
f.a.a. (E)	Nestle	28.00	Isocal	Novartis	7.60
Optimental (SE)	Ross	24.30	Isosource 1.5	Novartis	4.44
Peptamen (SE)	Nestle	24.06	Jevity 1.0	Ross	6.60
Peptamen 1.5 (SE)	Nestle	24.22	Jevity 1.5	Ross	6.60
Peptinex (SE)	Novartis	21.60	Novasource 2.0	Novartis	3.04
Peptinex DT (SE)	Novartis	18.58	Nutren 1.5	Nestle	3.72
Perative (SE)	Ross	8.68	Nutren 2.0	Nestle	2.99
Subdue (SE)	Novartis	19.79	Osmolite 1.0	Ross	6.94
Subdue Plus (SE)	Novartis	13.19	Osmolite 1.2	Ross	6.08
Tolerex (E)	Novartis	16.70	Probalance	Nestle	6.84
Vital HN (SE)	Ross	20.28	Promote	Ross	6.60
Vivonex T.E.N. (E)	Novartis	18.33	Replete	Nestle	7.35
Vivonex Plus (E)	Novartis	31.30	TwoCal HN	Ross	3.21

Ross Consumer Relations
1-800-227-5767
Monday–Friday 8:30 A.M.–65:00 P.M. EST
www.ross.com

Nestlé InfoLink Product and Nutrition Information Services
1-800-422-2752
Pricing: 1-877-463-7853
Monday– Friday 8:30 A.M.–65 P.M. CST
www.nestleclinicalnutrition.com

Novartis Medical Nutrition Consumer and Product Support
1-800-333-3785 (choose Option 3)
Monday–Friday 9:00 A.M.–6:00 P.M. EST
http://www.novartisnutrition.com/us/home

*Except for Nestle products, price does not include shipping and handling; +Per 800# on 11/7/05; E = elemental; SE = Semi-elemental; Note: Lipisorb, Criticare HN and Reabilan are no longer available; Used with permission from the University of Virginia Health System Nutrition Support Traineeship Syllabus (Parrish '05)

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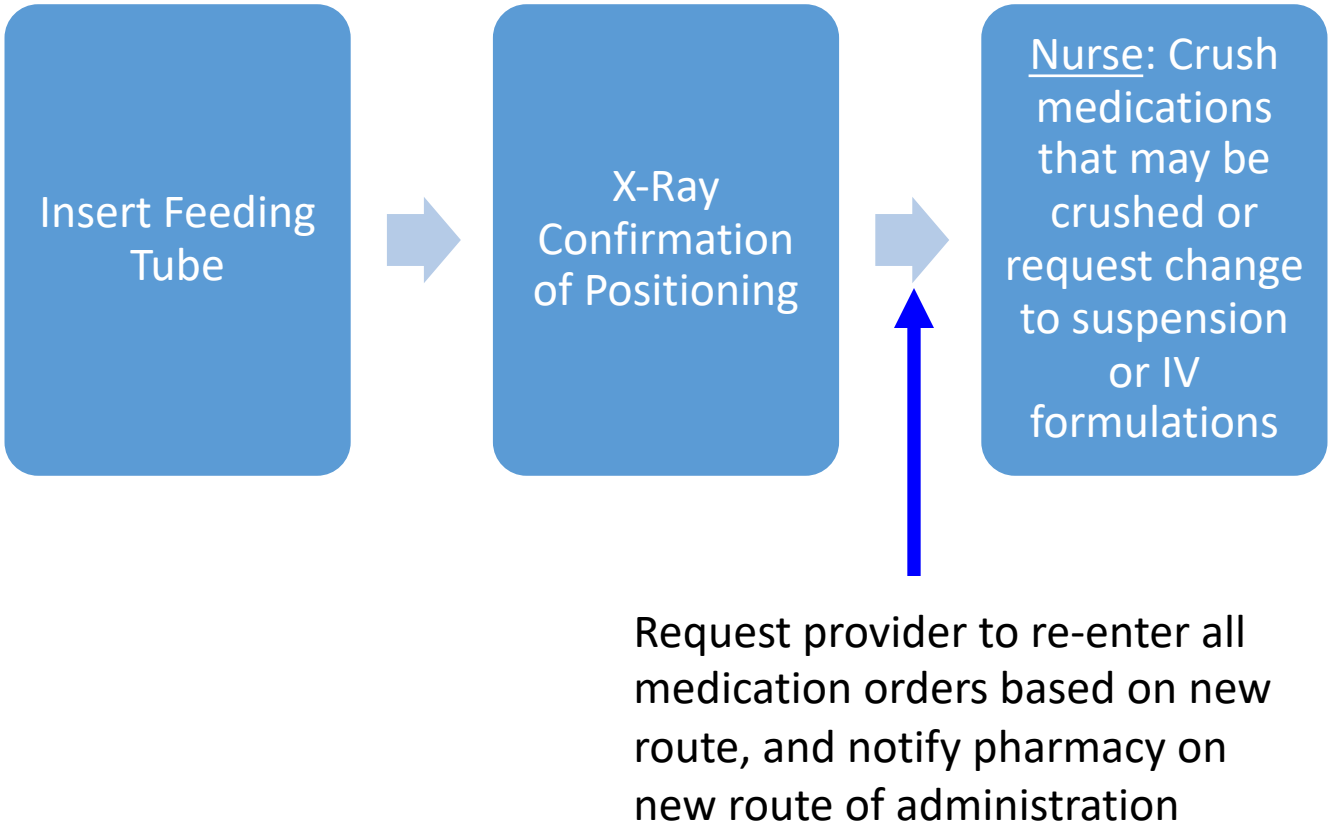
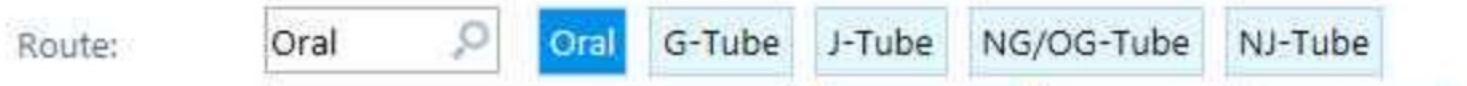
Common Workflow of Feeding Tube



Questions to Consider

- Are these routes available in the electronic health record (EHR)?
- Are these routes optimized for specific medication in the EHR?
  - If route not orderable, will providers still order the medication?
- Are these routes optimized for post-pyloric?



- Are health care professionals aware of potential implications of post-pyloric feeding on medication and enteral nutrition administration?
- Is the workflow conducive to timely captured of change in route?

Patient Case: Pre-Op CABG

DM is a 69 year old male (65kg) transferred by helicopter for direct admission to operating room for emergent on-pump CABG s/p STEMI with hemodynamic instability secondary to confirm thrombosis of a previously inserted left anterior descending (LAD) artery stent.

PMH: Chronic nonvalvular afib, mitral stenosis, type-II diabetes mellitus, diabetic gastroparesis, hypertension, and systolic CHF.

Admission Medication Reconciliation

Medication From Home	Continue/Hold/Discontinuation/Edit?
Rivaroxaban 20mg PO QAM w/ breakfast	Hold. Reversed w/ 4F-PCC
Metformin 500 mg PO BID	Hold.
Metoprolol 25 mg PO BID	Edit. Metoprolol 5 mg IVPB Q6H
Aspirin 81 mg PO DAILY	Hold
Atorvastatin 80 mg PO QHS	Hold.
Sucralfate 1 gram PO QID	Hold.
Hydrochlorothiazide 25 mg PO DAILY	Discontinue.

Patient Case: Post-Op CABG

POD1: received units of pRBC. Remains on IABP and mech vent. Fluid optimization w/ furosemide IV. NJT inserted. Trophic feed with Diabetisource® 1.2 formula initiated. Patient unable to provide history. Diarrhea present.

POD2: Wean off IABP. Remains on mech vent. Trophic feeding. IV-to-enteral metoprolol. Order to re-initiate atorvastatin, aspirin, sucralfate, and rivaroxaban via NGT. Start clopidogrel 75mg NGT DAILY. Patient unable to provide history. Diarrhea still present. *C. diff* stool: neg

Rounding Clinical Pharmacist intervention:

- Discontinue sucralfate
- Discontinue rivaroxaban
- Start heparin IV continuous infusion
- Change enteral feed from Diabetisource® 1.2 to Vital AF 1.2®

Assessment Question 1: Post-Pyloric Administration of Medication

Which of the following medication result in decrease AUC by >25% when given post-pyloric?

a) Doxycycline
b) Moxifloxacin
c) Carbamazepine
d) None of the above

Assessment Question 2: Enteral Formulation

Which of the following EN formula type contains pre-digested macronutrients and is use for impaired digestive capability (e.g., bypass pancreatic enzymes, Crohn's Disease uncontrolled by pancrealipase)?

a) Polymeric
b) Oligomeric
c) Specialty
d) Modular

Assessment Question 3: EN Formulations

While reviewing medication orders, the staff pharmacist notice multiple IV and oral medications being ordered for a new post-op patient. There is no feeding tube documented in the ”lines, devices, access” section of the medication, but there is a chest x-ray order pending for “confirmation of gastric tube placement”. Based on the workflow recommendation from an earlier slide in this presentation, to avoid any medication error, the staff pharmacist should:

a) Call the nurse and ask if a feeding tube is present in the patient
b) Call the ordering provider and request the oral medication be changed to NGT, since that route will cover all enteral med orders
c) Call the ordering provider and recommendation change of oral medication to the exact type of route present (e.g., NGT, OGT, NJT, OJT) or IVPB as appropriate
d) Do not call anyone and verify all medications as ordered

Key Summary of the Presentation

- NGT or Per G ≠ NJT or Per J
  - Distinction important within EHR
  - Order must be change immediately upon route change
- NJT or Per J should be unorderable for selected medication
  - Sucralfate
  - Rivaroxaban
  - Ciprofloxacin
- Close monitoring of serum carbamazepine warranted
- Providers may still order regardless of ordering route availability
  - Post-op
  - If in-doubt, call

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