# Gastrostomy Tube Placement Pathway v3.0: **Table of Contents**

**Stop** and **Review**

**Inclusion Criteria**

- All patients anticipated to receive primary gastrostomy tube, primary gastrojejunostomy tube, or gastrostomy with fundoplication

**Exclusion Criteria**

- Patients scheduled for concurrent major surgical interventions
- Patients undergoing gastrostomy tube change, repair, or g to j tube advancement

## Gastrostomy Tube Placement Care



## Appendix

# Gastrostomy Tube Placement Pathway v3.0: **Pre-Op**

**Stop** and **Review**

### Inclusion Criteria
- All patients anticipated to receive primary gastrostomy tube, primary gastrojejunostomy tube, or gastrostomy with fundoplication

### Exclusion Criteria
- Patients scheduled for concurrent major surgical interventions
- Patients undergoing gastrostomy tube change, repair, or g to j tube advancement

### Default to General Surgery Placement
- Children < 4 kg
- Children at high-risk for forceful gastrostomy pulling
- Children with anatomic anomalies, such as anomalies of intestinal rotation
- Kyphoscoliosis
- Hiatal hernia
- Children with prior abdominal operations precluding percutaneous placement
- Concomitant other operation

### Recommendations
- Prophylactic fundoplication is not recommended for any patient population.
- Gastrostomy tube placement alone will be done only if the patient demonstrates tolerance of nasogastric feeds.
- Patients under 1 year of age who are unable to demonstrate tolerance of nasogastric feeds (due to physiologic regurgitation) and who are unable to protect their airway may be considered for fundoplication with gastrostomy tube placement
- Fundoplication with gastrostomy tube placement may be considered in patients with progressive neurologic disorders.
- Avoidance of gastrojejunostomy tube placement should be considered in cases where families have difficulty accessing adequate medical care secondary to geography or other environmental circumstances.

**Gastrostomy tube Readiness Checklist completed?**

No → **! Do not schedule**

Yes ↓

**Procedure Scheduled**

Provide the following Patient Education handouts, as needed
- PE1697 Low-Profile GTube Feeding Instructions
- PE1698 PEG GTube Feeding Instructions
- PE1699 NG Tube Feeding Instructions
- PE1701 GJ Tube Feeding Instructions
- PE442 Blenderized Tube Feeding
- PE1102 Emergency Gravity Feeding Instructions

**Pre-Op Phase ordered and initiated by proceduralist**
- Perioperative abx
- Pre-op Universal "time out"

OR → **IR Only**
**IR Pre-Op Phase ordered and initiated by IR service**

### Recommendations
- Place a gastrostomy tube through the rectus abdominis midway between the umbilicus and costal margin, in the antrum of the stomach away from the pylorus

**Intra Op**
- Tube lot number and brand recorded
- 14 french gastrostomy tube will be placed

Transfer to PACU

**PACU Management**
- Pain: IV morphine
- NPO, IVF orders

**Discharge from PACU**
- Patient stable, pain controlled
- Signout to admitting team is completed by proceduralist

Signout from Proceduralist to Admitting service

**Post-Op Phase ordered and initiated by proceduralist**

**! Signout must occur from proceduralist to admitting team prior to transfer from PACU**

Last Updated: May 2022
Next Expected Review: May 2016

For questions concerning this pathway, contact:
gastrostomytubeplacement@seattlechildrens.org

If you are a patient with questions contact your medical provider, Medical Disclaimer

# Gastrostomy Tube Placement Pathway v3.0: **Inpatient Care**

For more detail, please refer to the Guidelines of Care: Gastrostomy Tubes: Post-op Care and Maintenance, 10466 (*for SCH only*)

## Inpatient Management POD #0

- Admit to: Medical Home service or Medical Hospitalist if no medical home identified
- NPO except for medications via gastrostomy 6 hours post-op. Use liquid medication when available
- For patients with gastrojejunostomy, g tube to be used for medications
- Standardized, age/developmentally appropriate pain scores (N-PASS, FLACC) will be used to assess pain every four hours and before and after pain medication delivery
- Patients ≥ 6 months will receive scheduled acetaminophen and ibuprofen alternating. Patients < 6 months old will not receive ibuprofen
- Narcotics only for breakthrough pain
- If not tolerating enteral medications, IV toradol and rectal acetaminophen can be used
- Consider concurrent procedures when assessing pain
- Nursing orders: routine VS, strict I&O, IV maintenance fluids
- Contact proceduralist for specific questions/concerns regarding the recently placed tube
- Care coordination notified
- Nutrition consult ordered

**!**
**Stop feeds and notify provider for pain with feeding, vomiting, abdominal distention, fresh bleeding, or external leakage of gastric contents**

## Inpatient Management POD #1

- Admitting provider to assess patient prior to initiation of feeds. Any concerns about the patient assessment or initiation of feeds should be discussed with the proceduralist care team
- Start full strength feeds the morning following tube placement at 50% goal volume. For bolus feeds, advance to full feed volume over 3 boluses. For continuous feeds, advance volume q 1 hour to goal volume feeds by 6 hours
- If not tolerating feeds, contact admitting provider for further assessment and plans
- Patients may receive enteral narcotics only for breakthrough pain
- Nursing orders: routine VS, strict I&O, q 4 hr pain assessment with N-PASS, FLACC scores in addition to pre and post pain medication administration, call for " pain with feeding, vomiting, abdominal distention, fresh bleeding, or leaking at tube site"
- Contact proceduralist for specific questions/concerns regarding the recently placed tube

Assess discharge criteria

## Discharge Criteria

- Tolerance of pre-operative feeding volume
- Tolerance of pre-operative medication regimen
- Adequate pain control and tolerance of post-operative pain medications
- Passage of stool OR flatus
- Completion of home teaching
- Home health follow-up plans arranged
- Home equipment available
- Follow- up appointments with primary dietitian and proceduralist service scheduled
- Temp < 38c x 12 hrs, no incision redness or pain, UOP > 0.5 ml/kg/hr if > 2years old, >1ml/kg/hr if < 2 years old

Yes, however patient to remain hospitalized for ongoing management of comorbidities

Yes, discharge

No

**Off Pathway**

## Discharge Instructions

- Schedule follow up with proceduralist team in 10-14 days and at 90 days
- Follow up with primary dietitian and feeding tube home in 4 weeks
- Print PE1700 Gastrostomy feeding and Tube Care and review with caregivers
- Provide the following Patient Education handouts, as needed:
  - PE1697 Low-Profile GTube Feeding Instructions
  - PE1698 PEG GTube Feeding Instructions
  - PE1699 NG Tube Feeding Instructions
  - PE1701 GJ Tube Feeding Instructions
  - PE442 Blenderized Tube Feeding
  - PE1102 Emergency Gravity Feeding Instructions

## Continued inpatient management per admitting service

- Contact proceduralist team for specific questions/concerns regarding the recently placed tube

Last Updated: May 2022
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# Gastrostomy Tube Readiness Checklist

*All parts of this form **must be completed prior to scheduling of surgery**. This is ordered through Ad hoc Charting.. This form can be ordered by licensed independent providers and IR (e.g. Kirby Meyer PA, Amy Skjonsberg IR Nurse Coordinator)*

1. **Nasogastric/nasoduodenal feeding trial successfully completed (at goal feeding regimen)?**
   Yes
   No – Reason:
2. **If indicated, upper GI study completed and ligament of Treitz is in correct position?**
   Yes
   No – Reason:
3. **Feed Tube home identified?**
   Yes
   No – Reason:
   Feed Tube home (Provider name and service, if provider is not on staff at SCH, please specify phone number):
4. **Nutrition/tube feeding plan determined (including goals and timelines)?**
   Yes
   No – Reason:
5. **Is patient followed by dietitian at Seattle Children's?**
   Yes – Who? (use provider selector box)
   No
   Other (community-based) dietitians: (optional field)
6. **Is patient already followed by a Seattle Children's feeding therapist (OT/PT/SLP)?**
   Yes – Who?
   No – Reason:
   Other feeding therapists: (optional field)
7. **Family social/psych readiness assessed?**
   Yes
   No – Reason:
8. **Home health care company identified?**
   Yes – Who?
   No – Reason:
9. **Based on the questions above, is patient ready to be scheduled for gastrostomy tube placement?**
   Yes
   No – Reason:
10. **Has family received the appropriate patient education materials?**
    - PE1697 Low-Profile GTube Feeding Instructions
    - PE1698 PEG GTube Feeding Instructions
    - PE1699 NG Tube Feeding Instructions
    - PE1701 GJ Tube Feeding Instructions
    - PE442 Blenderized Tube Feeding
    - PE1102 Emergency Gravity Feeding Instructions

# Pre- and Intra-Operative Recommendations, 2013

- Prophylactic fundoplication is not recommended for any patient population. **+1, Very low quality & Consensus**
- Gastrostomy tube placement alone will be done only if the patient demonstrates tolerance of nasogastric feeds. **+1, Very low quality & Consensus**
- Patients under 1 year of age  who are unable to demonstrate tolerance of nasogastric feeds (due to physiologic regurgitation) and who are unable to protect their airway, should be considered for fundoplication with gastrostomy tube placement or gastrojejunostomy placement after GI consult has been completed. **+1, Very low quality & Consensus**
- Fundoplication with gastrostomy tube placement may be considered in patients with progressive neurologic disorders. **+1, Very low quality & Consensus**
- Avoidance of gastrojejunostomy tube placement should be considered in cases where families have difficulty accessing adequate medical care secondary to geography or other environmental circumstances. **Consensus expert opinion**
- Place a gastrostomy tube through the rectus abdominis midway between the umbilicus and costal margin, in the antrum of the stomach away from the pylorus. **Consensus expert opinion**
- 16 French will be the default size for gastrostomy tube placement. **Consensus expert opinion**

# Post-Operative Recommendations, 2013

- Administration of medications by gastrostomy may begin six hours post-operatively. **Consensus expert opinion**
- Standardized, age and developmentally appropriate pain scores (N-PASS, FLACC) will be used to assess pain every four hours in addition to before and after pain medication delivery. **Consensus expert opinion**
- Patients greater than 6 months old will receive “around-the-clock,” staggered acetaminophen and ibuprofen and narcotics as needed for breakthrough pain. Patients less than 6 months old will not receive ibuprofen. On the day of surgery, intravenous morphine can be used, on subsequent days patients will be transitioned to enteral oxycodone. If not tolerating enteral medications, IV Toradol and rectal acetaminophen can be used. **Consensus expert opinion**
- **Start full strength feeds the morning following tube placement at 50% goal volume. For bolus feeds, advance to full feed volume over 3 boluses. For continuous feeds, advance volume q 1 hour to goal volume feeds by 6 hours. Consensus expert opinion**
- Stop gastrostomy tube feedings and notify provider for pain with feeding, vomiting, abdominal distention, fresh bleeding, or leaking at tube site. **+1, Very low quality**
- Discharge criteria following percutaneous tube placement will include :
  - Tolerance of pre-operative feeding volume.
  - Tolerance of pre-operative medication regimen.
  - Patient has passed stool or flatus.
  - Adequate pain control and tolerance of post operative pain medications
  - Completion of home teaching, home health follow up plans and availability of home equipment.
  - Follow up appointments with proceduralist in 10-14 days and nutrition in 4 weeks scheduled. **Consensus expert opinion**

# Summary of Version Changes

- **Version 1.0 (5/28/2013):** Go live.
- **Version 2.0 (3/16/2015):** Updates to the Readiness Checklist and reformatted to meet new CSW standards/formats.
- **Version 3.0 (5/3/2022):** Changes include:
  - New formatting style
  - Added list of patient education to be provided during pre-operative phase
  - Removed requirement for mandatory upper GI
  - Updated inpatient medication management
  - Changed recommended tube to 14 French
  - Updated Discharge Instructions

# Approval & Citation

**Approved by the CSW Gastrostomy Tube Placement Pathway team for May, 2013, go-live**

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| | |
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**Retrieval Website:** https://www.seattlechildrens.org/pdf/gastrostomy-tube-placement-pathway.pdf

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# Evidence Ratings

This pathway was developed through local consensus based on published evidence and expert opinion as part of Clinical Standard Work at Seattle Children's. Pathway teams include representatives from Medical, Subspecialty, and/or Surgical Services, Nursing, Pharmacy, Clinical Effectiveness, and other services as appropriate.

When possible, we used the GRADE method of rating evidence quality. Evidence is first assessed as to whether it is from randomized trial or cohort studies. The rating is then adjusted in the following manner (from: Guyatt G et al. J Clin Epidemiol. 2011;4:383-94, Hultcrantz M et al. J Clin Epidemiol. 2017;87:4-13.):

Quality ratings are *downgraded* if studies:

- Have serious limitations
- Have inconsistent results
- If evidence does not directly address clinical questions
- If estimates are imprecise OR
- If it is felt that there is substantial publication bias

Quality ratings are *upgraded* if it is felt that:

- The effect size is large
- If studies are designed in a way that confounding would likely underreport the magnitude of the effect OR
- If a dose-response gradient is evident

**Certainty of Evidence**

✪✪✪✪ High: The authors have a lot of confidence that the true effect is similar to the estimated effect
✪✪✪○ Moderate: The authors believe that the true effect is probably close to the estimated effect
✪✪○○ Low: The true effect might be markedly different from the estimated effect
✪○○○ Very low: The true effect is probably markedly different from the estimated effect
Guideline: Recommendation is from a published guideline that used methodology deemed acceptable by the team
Expert Opinion: Based on available evidence that does not meet GRADE criteria (for example, case-control studies)

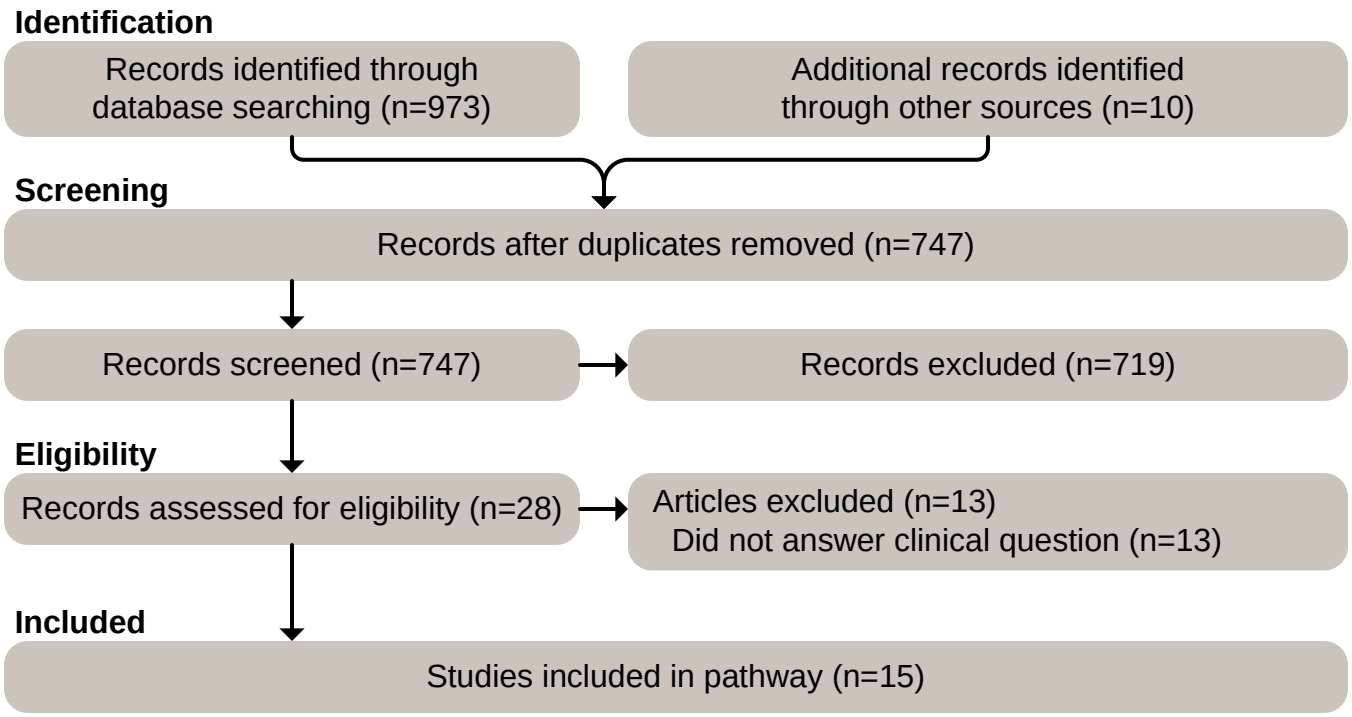
# Bibliography 2013

**Literature Search Methods**

Studies were identified by searching electronic databases using search strategies developed and executed by a medical librarian, Susan Klawansky. Searches were performed in April, 2012. The following databases were searched – on the Ovid platform: Medline (2002 to date), Cochrane Database of Systematic Reviews (2005 to date); elsewhere – Embase (2002 to date), Clinical Evidence, National Guideline Clearinghouse, TRIP and Cincinnati Children's Evidence-Based Care Guidelines. Retrieval was limited to children (0-18 years of age) and English language. In Medline and Embase, appropriate Medical Subject Headings (MeSH) and Emtree headings were used respectively, along with text words, and the search strategy was adapted for other databases as appropriate. Concepts searched were enteral nutrition, gastrointestinal intubation, gastrostomy and associated terms for various types of feeding tubes. All retrieval was further limited to certain evidence categories, such as relevant publication types, index terms for study types and other similar limits.

**Literature Search Results**

The search retrieved 973 records. Once duplicates had been removed, we had a total of 747 records. We excluded 719 records based on titles and abstracts. We obtained the full text of the remaining 28 records and excluded 13. We included 15 studies. The flow diagram summarizes the study selection process.




Flow diagram adapted from Moher D et al. BMJ 2009;339:bmj.b2535

# Bibliography 2013

## Included Studies


Barnhart. Effectiveness of fundoplication at the time of gastrostomy in neurologically impaired infants. JAMA-Pediatrics accepted, publication pending.

Bankhead, R., Boullata, J., Brantley, S., et al.(2009). Enteral nutrition practice recommendations. Jpen: Journal of Parenteral & Enteral Nutrition, 33, 2, 122-167.

Burd R.S., Price, M.R., Whalen, T.V. (2002 Mar). The Role of Protective Antireflux Procedures in Neurologically Impaired Children: A Decision Analysis. J Pediatr Surg; 37 (3): 500-506

Chao, N.S.Y., Leung, M.W.Y., Poon, M., Wong, B.P.Y., Chung, K.W., Kwok, W.K., Liu, K.K.W. (2009). Fundoplication in children with neurological impairment: A worthwhile surgical treatment? Hong Kong J.Paediatr., 14, 3, 152-157

Cheung, K.M., Tse ,H.W., Tse ,P.W., Chan ,K.H. (2006). Nissen fundoplication and gastrostomy in severely neurologically impaired children with gastroesophageal reflux. Hong Kong Med.J., 12, 4, 282-288

Harrington, J.W., Brand, D.A., Edwards, K.S. (2004). Seizure disorder as a risk factor for gastroesophageal reflux in children with neurodevelopmental disabilities. Clin.Pediatr.(Phila), 43, 6, 557-562

Kawahara, H., Okuyama, H., Kubota, A., Oue, T., Tazuke, Y., Yagi, M., Okada, A.(2004) Can laparoscopic antireflux surgery improve the quality of life in children with neurologic and neuromuscular handicaps?. J.Pediatr.Surg., 39, 12, 1761-1764

Kuenzler, K.A. (2003 Aug). Gastric Volvulus After Laparoscopic Nissen Fundoplication With Gastrostomy. J Pediatr Surg: 38 (3):1241-1243

Partrick, D.A. (2007 June) Gastrointestinal tract feeding access and the role of fundoplication in combination with gastrostomy. Curr Opin Pediatr; 19 (3):333-7

Rapid Response Report: Early Detection of Complications after gastrostomy
Source: National Patient Safety Agency, NHS United Kingdom, March 2010

Sjovie, H., Larsson, L.T., Arnbjornsson, E. (2010). Postoperative gastrostomy site leakage correlated to the dimension of the gastrostomy button in children Gastroenterol.Insights, 2, 1, 34-36

Srivastava, R., Downey, E.C., O'Gorman, M., Feola, P., Samore, M., Holubkov, R., Mundorff, M., James, B.C., Rosenbaum, P., Young, P.C., Dean, J.M. (2009). Impact of fundoplication versus gastrojejunal feeding tubes on mortality and in preventing aspiration pneumonia in young children with neurologic impairment who have gastroesophageal reflux disease. Pediatrics,123, 1, 338-345

Roberts, A.V., Sullivan, P.B. (2009). Fundoplication versus post-operative medication for gastro-oesophageal reflux in children with neurological impairment undergoing gastrostomy.Cochrane Database of Systematic Reviews, 4

Viswanath, N., Wong, D., Channappa, D., Kukkady, A., Brown, S., Samarakkody, U. (2010). Is prophylactic fundoplication necessary in neurologically impaired children?. Eur.J.Pediatr.Surg., 20, 4, 226-229

Wales, P.W., Diamond, I.R., Dutta, S., et al. (2002). Fundoplication and Gastrostomy Versus Image-Guided Gastrojejunal Tube for Enteral Feeding in Neurologically Impaired Children With Gastroesophageal Reflux. J Pediatr Surg; 37 (3):407-412.

# Medical Disclaimer

Medicine is an ever-changing science. As new research and clinical experience broaden our knowledge, changes in treatment and drug therapy are required.

The authors have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standards accepted at the time of publication.

However, in view of the possibility of human error or changes in medical sciences, neither the authors nor Seattle Children's Healthcare System nor any other party who has been involved in the preparation or publication of this work warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such information.

Readers should confirm the information contained herein with other sources and are encouraged to consult with their health care provider before making any health care decision.