Gastrostomy Tube Placement: Pre-op Phase v2.0

**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

**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.

**Prophylactic Fundoplication**
- Children < 4 kg
- Children at high-risk for forceful gastrostomy pulling
- Children with anatomic anomalies
- Kyphoscoliosis
- Hiatal hernia
- Children with prior abdominal operations precluding percutaneous placement
- Concomitant other operation

**Default to General Surgery Placement**
- 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

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**Default to General Surgery Placement**
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Gastrostomy Tube Placement: Inpatient Phase v2.0

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 in addition to before and after pain medication delivery.
- Patients will receive acetaminophen “around-the-clock” in addition to narcotics and ibuprofen as needed for breakthrough pain. 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.
- Consider concurrent procedures when assessing pain.
- Contact proceduralist for specific questions/concerns regarding the recently placed tube.
- Admitting provider to assess patient prior to initiation of feeds.
- Patients will receive acetaminophen “around-the-clock” in addition to narcotics and ibuprofen as needed for breakthrough pain. 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.
- Consider concurrent procedures when assessing pain.
- Contact proceduralist for specific questions/concerns regarding the recently placed tube.
- Nutrition consult ordered.

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.
- Pain control: Patients greater than 6 months old will be transitioned to enteral oxycodone and scheduled acetaminophen and ibuprofen. Patients less than 6 months old will not receive ibuprofen.
- Nursing orders: routine VS, strict I&O, IV maintenance fluids, Feeding tube to be vented NOT clamped.
- Consider concurrent procedures when assessing pain.
- Contact proceduralist for specific questions/concerns regarding the recently placed tube.

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
- Availability of home equipment
- 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 > 2 years old, >1ml/kg/hr if < 2 years old.

Discharge Instructions

- Follow up with proceduralist in 10-14 days
- Follow up with primary dietitian and medical home in 4 weeks

Yes, discharge

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

Continued inpatient management per admitting service

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

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

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Last Updated: March 2015
Next Expected Revision: May 2016
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. 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:
Executive Summary

Objective
To standardize and improve the immediate post op care of children who have undergone gastrostomy tube placement, including parent education and discharge planning. We also developed a pre-scheduling gastrostomy tube readiness checklist to help standardize the treatment families receive before being scheduled for a new gastrostomy tube placement.

Recommendations
1. Prophylactic fundoplication is not recommended for any patient population.
2. Gastrostomy tube placement alone will be done only if the patient demonstrates tolerance of nasogastric feeds.
3. 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.
4. Fundoplication with gastrostomy tube placement may be considered in patients with progressive neurologic disorders.
5. 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.
6. 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.
7. 16 French will be the default size for gastrostomy tube placement.
8. Administration of medications by gastrostomy may begin six hours post-operatively.
9. 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.
10. 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.
11. 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.
12. Stop gastrostomy tube feedings and notify provider for pain with feeding, vomiting, abdominal distention, fresh bleeding, or leaking at tube site.
13. 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.
Executive Summary, cont.

- Follow up appointments with proceduralist in 10-14 days and nutrition in 4 weeks scheduled

Rationale
- Safety will be improved with the development of specific discharge criteria, consistent family education and scheduled follow-up with the proceduralist care team. These changes will minimize unnecessary medical interactions.
- Quality of care will be improved by reducing variability with standardization, incorporating the use of the best available evidence and consensus.
- Delivery will be improved by standardizing the length of stay needed for simple gastrostomy tube placement, resulting in a shorter LOS for the majority of patients.
- Engagement is grounded in the fact that the pathway has been developed, reviewed, and vetted by all members of the medical team.
- Patient/Family Satisfaction will be improved by assuring patients are only scheduled for gastrostomy tubes when the appropriate plans are in place, and that all families will be discharged with adequate knowledge of how to care for their child’s new feeding tube.
- Cost of care is anticipated to be more predictable and easier to measure and control with a more standardized process. We are hoping this change will result in a reduction in the number of unnecessary medical interactions.

Evidence
The departments of General Surgery, GI and Interventional Radiology have been working together to create a comprehensive and standardized feeding tube approach. This work builds on several consensus points reached by this team through a separate RPD event.

We have supplemented this approach with the querying of evidence to augment the clinical practices of pre-operative readiness, and post-operative feeding and discharge. A literature search was conducted by our librarian services in attempt to answer these clinical questions with the highest level of evidence. These references were further reviewed and their applicability to these questions summarized and documented to inform recommendations. (Please see the Evidence and Recommendations document for specific details.)

Implementation Items
- Pre-scheduling Readiness Checklist, to be filled in by GI, Surgery, or IR providers prior to procedure scheduling. Inpatient gastrostomy tube placements should call the MCC Consult service for patients anticipated to receive a gastrostomy tube. The MCC consult service will complete this checklist for inpatient consults only.
- Gastrostomy Tube Placement power plan
- New Picture-based family education materials
- Updated nursing Guideline of Care
Executive Summary

Metrics Plan
In addition to the core Clinical Effectiveness metrics, we will be monitoring these additional process metrics:

- Gastrostomy Tube Readiness Checklist Usage (Denominator pop: all patients with powerplan activated)
- Return to OR within 48 hours post op
- Return to OR for unplanned gastrostomy tube procedure within six months
- Return to ED/OR/inpatient within 30 days

PDCA Plan
The CSW owner and committee will follow metrics, continue to review medical literature, and make alterations to the pathway as needed.

Revision History
Date Approved: May 2013
Next Review Date: May 2016
Executive Summary

Approved by the CSW Gastrostomy Tube Placement Team, May 2013

CSW Gastrostomy Tube Placement Team:

General Surgery, Owner
General Surgery, Owner
Medical Administration, Team Member
Medical Unit, CNS Team Member
Gastroenterology, Team Member
Nutrition, Team Member
Intervention Radiology, Team Member
General Surgery, Team Member
Parent, Consultant/Team Member
CSW, Literature Search Support

Adam Goldin, MD, MPH
Arlene Libby
Jennifer Abermanis
Kristi Klee, MSN, RN-BC
David Suskind, MD
Kim Cooperman, RD
Katie Richey, RN
Jenny Kreiss, ANP
Maria Cho
Jocelyn Hayes, MD

Clinical Effectiveness Team:

Consultant:
Project Leader:
KM Analyst:
CIS Informatician:
CIS Analyst:
Librarian:
Program Coordinator:

Jeff Foti, MD
Caren Goldenberg, MPH
Suzanne Spencer, MBA, MHA
Mike Leu, MD, MS, MHS
Heather Marshall
Susan Klawansky, MLS
Asa Herrman

Return to Home
Recommendations (Pre and Intra-operative)

- Prophylactic fundoplication is not recommended for any patient population.  
  💡💡💡 Very low quality & Consensus

- Gastrostomy tube placement alone will be done only if the patient demonstrates tolerance of nasogastric feeds. 💡💡💡 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. 💡💡💡 Very low quality & Consensus

- Fundoplication with gastrostomy tube placement may be considered in patients with progressive neurologic disorders. 💡💡💡 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
Recommendations (Post-op)

- 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. 4 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
We used the GRADE method of rating evidence quality. Evidence is first assessed as to whether it is from randomized trial, or observational studies. The rating is then adjusted in the following manner:

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 can be *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

**Quality of Evidence:**
- 🌟🌟🌟🌟 High quality
- 🌟🌟🌟 Moderate quality
- 🌟🌟🌟 Low quality
- 🌟🌟🌟 Very low quality
- 🌟🌟🌟🌟 Expert Opinion (E)

Summary of Version Changes

- **Version 1.0 (5/28/13):** Go live
- **Version 2.0 (3/16/15):** Updates to the Readiness Checklist and reformatted to meet new CSW standards/formats
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.
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.

Susan Klawansky, MLS, AHIP

June 21, 2012

Identification

973 records identified through database searching

10 additional records identified through other sources

Screening

747 records after duplicates removed

747 records screened

719 records excluded

Eligibility

28 full-text articles assessed for eligibility

13 full-text articles excluded, 13 did not answer clinical question 0 did not meet quality threshold

Included

15 studies included in pathway

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

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


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. Postoperative gastrostomy site leakage correlated to the dimension of the gastrostomy button in children Gastroenterol.Insights, 2010, 2, 1, 34-36


VernonRoberts, Angharad; Sullivan, Peter B. Fundoplication versus post-operative medication for gastroesophageal reflux in children with neurological impairment undergoing gastrostomy. Cochrane Database of Systematic Reviews, 2009, 4


Gastrostomy Tube Placement Citation

Title: Gastrostomy Tube Placement

Authors:
- Seattle Children’s Hospital
- Adam Goldin
- Jeffrey Foti
- Caren Goldenberg
- Jocelyn Hayes
- Kristi Klee
- Jenny Kreiss
- Michael Leu
- David Suskind

Date: May 2013


Example: