SickKids	Document Scope: Hospital-wide Patient Care
	Document Type: Clinical Practice Guideline Approved on 2015-09-08 Next Review Date: 2018-09-07
	Management of Functional Constipation — Version: 2

1.0 Introduction

This pathway is for use with children aged 1-18 years old with no underlying disease or cormorbidity who have been diagnosed with functional constipation. Patients are to be removed from this pathway if there is a change in diagnosis.

1.1 Target Users: physicians, nurse practitioners and nurses hospital wide, physicians and nurse practitioners in the community

2.0 Definitions

Functional constipation - constipation without objective evidence of a pathological condition

PEG3350- polyethylene glycol 3350

Disimpaction - removing fecal mass prior to starting maintenance therapy

Rome III Criteria - criteria used as a diagnostic aid for functional constipation

Osmotic agent - medicine that helps draw water into the stool and make it softer

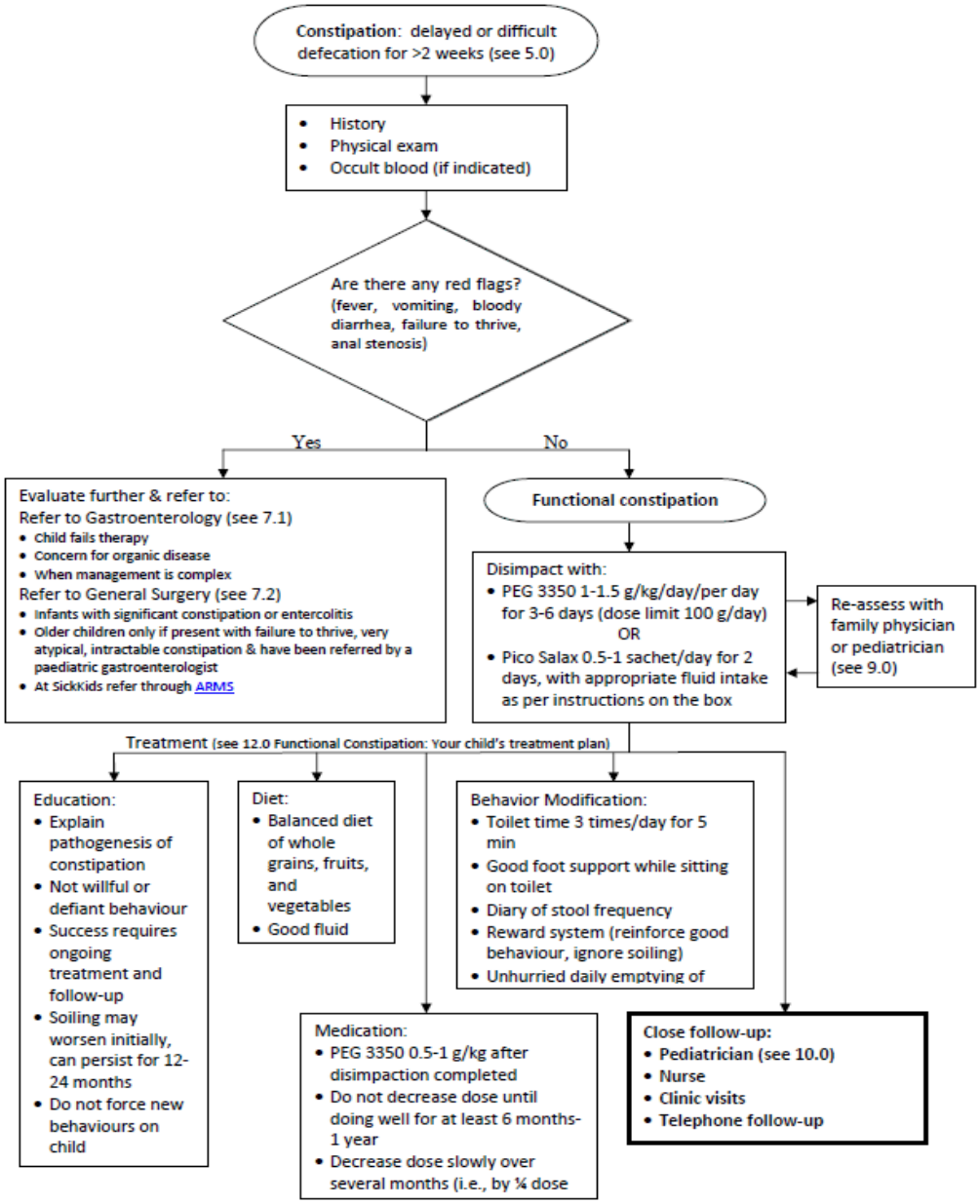
Stimulant laxative agent - medicine that stimulates the bowel to function

Encopresis - fecal soiling

3.0 Clinical Practice Guideline

This pathway was developed by an interdisciplinary clinical team from SickKids and the Greater Toronto Area using research knowledge, clinical experience and consensus agreement. This pathway is a general guideline and does not represent a professional care standard governing providers' obligations to patients. Care is revised to meet individual patient needs.

4.0 Decision Tree/Algorithm



5.0 Definition of Constipation

5.1 Delay or difficulty in defecation present for two or more weeks, and sufficient to cause significant distress to the patient.

5.2 Rome III diagnostic criteria for functional constipation
(criteria fulfilled at least once per week for at least two months before diagnosis):

Must include two or more of the following in a child with a developmental age of at least four years, with insufficient criteria for the diagnosis of irritable bowel syndrome.

1. Two or fewer defecations in the toilet per week
2. At least one episode of fecal incontinence per week
3. History of retentive posturing or excessive volitional stool retention
4. History of painful or hard bowel movements
5. Presence of large fecal mass in the rectum
6. History of large diameter stools that may obstruct the toilet

6.0 Differential Diagnosis of Constipation

6.1 Non-Organic

- Developmental - cognitive handicaps, attention-deficient disorders
- Situational - coercive toilet training, toilet phobia, school bathroom avoidance, excessive parental interventions, sexual abuse, other
- Depression
- Constitutional - colonic inertia, genetic predisposition
- Reduced stool volume & dryness - low fibre in diet, dehydration, underfeeding/malnutrition

6.2 Organic

- Anatomic malformations - imperforate anus, anal stenosis, anterior displaced anus, pelvic mass (sacral teratoma)
- Metabolic & Gastrointestinal - hypothyroidism, hypercalcemia, hypokalemia, Cystic Fibrosis, Diabetes Mellitus, Multiple Endocrine Neoplasia type 2B, Celiac disease
- Neuropathic conditions - spinal cord abnormalities, spinal cord trauma, Neurofibromatosis, static encephalopathy, tethered cord
- Intestinal nerve or muscle disorders - Hischsprung disease, Intestinal Neuronal Dysplasia, visceral myopathies, viseral neuropathies
- Abnormal abdominal musculature - Prune Belly, gastroschisis, Down syndrome
- Connective tissue disorder - Scleroderma, Systemic Lupus Erhthematosus, Ehler-Danlos syndrome
- Drugs - opioids, phenobarbital, sucralfate, antacids, antihypertensives, anticholinergics, antidepressants, sympathomimetics, iron supplements, calcium channel blockers
- Other - heavy metal ingestion (lead), Vitamin D intoxication, Botulism, Cows Milk Protein (or other food) intolerance

6.3 Physical Findings Distinguishing Organic Constipation from Functional Constipation

- Failure to thrive
- Abdominal distention
- Lack of lumbo-sacral curve
- Pilonidal dimple covered by tuft of hair
- Midline pigmentary abnormalities of the lower spine
- Sacral agenesis
- Flat buttocks
- Anteriorly displaced anus
- Patulous anus
- Tight empty rectum in presence of palpable abdominal fecal mass
- Gush of liquid stool and air from rectum on withdrawal of finger
- Occult blood in stool
- Absent anal wink
- Absent cremasteric reflex
- Decreased lower extremity tone and/or strength
- Absence or delay in relaxation phase of lower extremity deep tendon reflexes

7.0 When to Consult

7.1 Gastroenterology

- When child fails therapy
- When there is a concern for organic disease
- When management is complex

7.2 General Surgery

- Infants with significant constipation or enterocolitis
- Older children only if they present with failure to thrive or very atypical, intractable constipation and have been referred by a pediatric gastroenterologist
- At SickKids refer through ARMS

8.0 Medications

8.1 Efficacy

Polyethylene glycol (PEG-3350) is a safe and effective medication for the treatment of functional constipation in children and adults alike. Studies have shown that it is as effective in treating constipation and better tolerated then other osmotic agents, specifically milk of magnesia and lactulose. PEG-3350 does not cause dependency, unlike stimulant laxative agents, and is safe to use over an extended period of time.

8.1.1 Disimpaction or treatment of encopresis (Goal: the colon has been emptied - disimpaction continues until child is having 1-3 soft bowel movements per day)

- Polyethylene glycol 3350: 1-1.5g/kg/day with a maximum of 100g/day for 3-6 days
- PICO Salax: 0.5-1 sachet/day for 2 days (with appropriate fluid intake as per instructions on the box)

8.1.2 Maintenance therapy (Goal: having smooth, easy to pass, large bowel movement at least daily)

- Polyethylene glycol 3350: 0.5 - 1g/kg/day. Dose may be titrated until desired effect is achieved

8.1.3 Preventative therapy for patients on medications that may cause constipation (Goal: prevention of anticipated constipation)

- Polyethylene glycol 3350:0.5 - 1g/kg/day. Dose may be titrated until desired effect is achieved

8.2 Safety

- For functional constipation maintenance therapy avoid using Polyethylene glycol with electrolytes (i.e. Golytely or Peglyte)
- At the time of publication of this document Polyethylene glycol 3350 is considered a safe, long term maintenance treatment for functional constipation.

9.0 If Disimpaction Doesn't Work

- Titrate PEG3350 to effect (increase to maximum disimpaction dose)
- Consider weekly administration of Pico-Salax until soiling resolves (in conjunction with maintenance PEG3350)
- Referral to a pediatric Gastroenterologist
- Consider admission to hospital for lavage therapy
- Consider manual disimpaction under general anesthetic
- **Disimpaction with enemas or suppositories is not recommended, notably in children with developmental delay or autism**

10.0 Community Pediatrician Referral

The list below is comprised of pediatricians in the Greater Toronto Area who have an interest in managing constipation, however child should be followed by primary physician until appointment is made.

- Dr. Ivor Margolis - William Osler Health Centre
  - Phone #416-791-6444, Fax #416-791-3333
- North York General Hospital Paediatric Ambulatory Clinic
  - Phone #416-756-6479, Fax #416-756-6152
- Rouge Valley Paediatric Consultation Clinic
  - Phone #905-683-2320 ext. 4679 or #416-281-7476
- Pediatrics Group (Dr. Paul Meinert, Dr. Val Lewis, Dr. Ian Kitai, Dr. Karim Aref)
  - Phone #905-683-7593, Fax #905-683-7669
  - accept referrals from Durham region or east Scarborough
- St. Joseph's Pediatric Consultation Clinic
  - Phone#416-516-4111, Fax#416-516-1104

11.0 Development Process

11.1 Development Process & Statement of Evidence

This pathway was developed by in interdisciplinary clinical group from SickKids using research knowledge, clinical experience and consensus agreement. A literature search was completed using OVID using key words:children and constipation. This pathway is a general guideline and does not represent a professional care standard governing providers' obligations to patients. Care is revised to meet individual patient needs. Level C: Expert Opinion

Grades of Recommendation	
A	Recommendation supported by at least one randomized controlled trial, systematic review or meta-analysis.
B	Recommendation supported by at least one cohort comparison, case study or other experimental study.
C	Recommendation supported by expert opinion or experience of a consensus panel.

11.2 Guideline Group and Reviewers

Guideline Group Membership

Ted Gerstle, MD General Surgery
Jacob Langer, MD General Surgery
Kimberly Colapinto RN(EC), General and Thoracic Surgery
Monping Chiang RN(EC), General and Thoracic Surgery
Peggy Marcon, MD Gastroenterology
Vikki Scaini, RN Gastroenterology
Bruce Minnes, MD Emergency Medicine
Kelly Keogh, MD Emergency Medicine
Trent Mizzi, MD Emergency Medicine
Beth Gamulka, MDCM Pediatrics
Ivor Margolis, MD Pediatrics
Mark Feldman, MD Pediatrics
Julie Gardner, RN Pediatrics

Niraj Mistry, MD Pediatrics
Catherine Daniels RN(EC), Urology
Katharine Williams RN(EC), Urology
Janet Ahier, RN(EC) Orthopedics
Marina Strzelecki, Pharmacist

Internal Reviewers
Agostino Pierro, MD Chief of General and Thoracic Surgery
Annie Fecteau, MD,
Shannon Gainey RN, MN 5AB Manager

12.0 Related Documents

SickKids Formulary
Functional Constipation: Your Child's Treatment Plan
Constipation
High Fibre Diet
Pain Management Clinical Practice Guideline -->

13.0 References

1. Margolis, I. (2010). Treatment of Chronic Constipation and Encopresis
2. CAPS (2001). Pediatric constipation: Guidelines for referral to a paediatric surgeon. Paediatric Child Health, 6, 1 21-22.
3. NASPGHN (2006). Evaluation and treatment of constipation in infants and children: recommendations of the North American Society for pediatric gastroenterology, hepatology and nutrition. Journal of Pediatric Gastroenterology and Nutrition, 43: e1-13.
4. Michail et al. Polyethylene glycol for constipation in children younger than eighteen months old. Journal of Pediatric Gastroenterology and Nutrition. 2004;39:197-199.
5. DiPalma JA, Cleveland MB, McGowan J, Herrera JL. A randomized, multicenter, placebo-controlled trial of polyethylene glycol laxative for chronic treatment of chronic constipation. Am J Gastroenterol. 2007; 102:1436-1441.
6. Candy D, Belsey J. Macrogol (polyethylene glycol) laxatives in children with functional constipation and faecal impaction: a systematic review. Arch Dis Child. 2009; 94:156-160.
7. Belsey JD, Geraint M, Dixon TA. Systematic review and meta analysis: polyethylene glycol in adults with non-organic constipation. Int J Clin Pract. 2010; 64(7):944-955.
8. Loening-Baucke V, Pashankar DS. A randomized, prospective, comparison study of polyethylene glycol 3350 without electrolytes and milk of magnesia for children with constipation and fecal incontinence. Pediatrics. 2006; 118(2):528-535.
9. Lee-Robichaud H, Thomas K, Morgan J, Nelson RL. Lactulose versus polyethylene glycol for chronic constipation. Cochrane Database of Systematic Reviews. 2010; issue 7.
10. Nurko S, Youssef NN, Sabri M, Langseder A, McGowen J, Cleveland M, Di Loranzo C. PEG3350 in the treatment of childhood constipation: a multicenter, double-blind, placebo-controlled trial. Journal Pediatr. 2008; 153:254-261.

11. Youssef NN, Peters JM, Henderson W, Shultz-Peters S, Lockhart DK, Di Lorenzo C. Dose response of PEG 3350 for the treatment of childhood fecal impaction. J Pediatr. 2002; 141:410-414.
12. Pashankar DS, Bishop WP, Loening-Baucke V. Long-term efficacy of polyethylene glycol 3350 for the treatment of chronic constipation in children with and without encopresis. Clin Pediatr. 2003; 42:815-819.
13. Loening-Baucke V, Krishna R, Pashankar DS. Polyethylene glycol 3350 without electrolytes for the treatment of functional constipation in infants and toddlers. JPGN. 2004; 39:536-539.
14. Bekkali NH, van den Berg MM, Dijkgraaf MGW, van Wijk MP, Bongers MEJ, Liem O, Benninga MA. Rectal fecal impaction treatment in childhood constipation: enemas versus high dose oral PEG. Pediatrics. 2009; 124:e1108-e1115.
15. Pashankar DS, Leoning-Baucke V, Bishop WP. Safety of polyethylene glycol 3350 for the treatment of chronic constipation in children. Arch Pediatr Adolesc Med. 2003;157:661-664.
16. Dupont C, Leluyer B, Amar F, Kalach N, Benhamou PH, Moutarde O, Vannerom PY. A dose determination study of polyethylene glycol 4000 in constipated children: factors influencing the maintenance dose. JPGN. 2006; 42:178-185.
17. Thomas MA, Jenkins HR, Bisset WM, Heuschkel R, Kalra DS, Green MR, Wilson DC, Geraint M. Polyethylene glycol 3350 plus electrolytes for chronic constipation in children: a double blind, placebo controlled, crossover study. Arch Dis Child. 2007; 92:996-1000.
18. Hardikar W, Cranswick N, Heine RG. Macrogol 3350 plus electrolytes for chronic constipation in children: a single-centre, open-label study. Journal of Paediatrics and Child Health. 2007; 43:527-531.
19. Rowan-Legg A. Managing functional constipation in children. Paediatr Child Health. 2011; 16(10):661-665.
20. Chen, S., Cai, S., Deng, L., Zhang, X., Luo, T., Peng, J., Xu, J., Li, W., Chen, C., Ma, J. and He, Y. (2014). Efficacy and complications of polyethylene glycols for treatment of constipation in children: A meta-analysis. Medicine, 96, 16, 1-10.