Constipation: How to make "hard" things easier for you and the patient

3rd Annual Practical Day of Pediatrics 2022
Saturday, February 5, 2022

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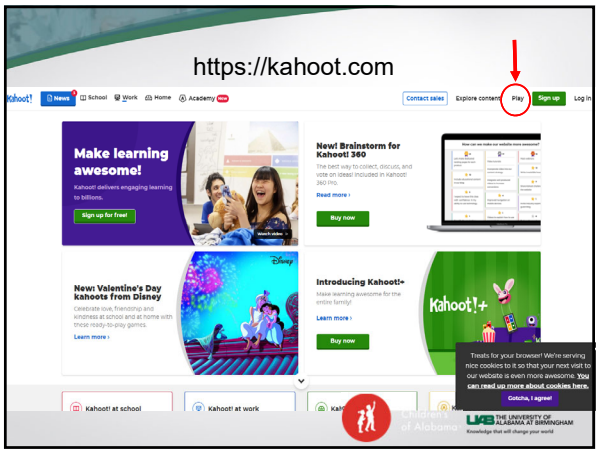
Children's of Alabama
THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Knowledge that will change your world

Disclosures

- No financial disclosures

Objectives

- Review defecation physiology
- Review existing literature and guidelines
- Learn some clinically helpful information
- Have some fun along the way

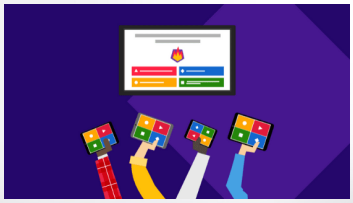


Bowel movements: *Facts and Physiology*

- Normal frequency?
  - Adults: 3 x weekly up to 3 x daily
  - Children: 4-9 x weekly (more HAPC's)
- Why the difference?
  - High amplitude propagating contractions (HAPC)
  - Infants and children have more

Reference: Mark Scott. The Physiology of Human Defecation. Dig Dis Sci (2012). PMID 22367113

Kahoot!



Bowel movements: *Facts and Physiology*

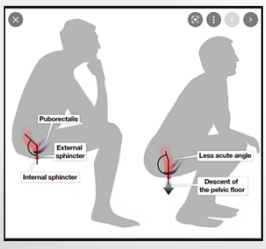
- Best defecation posture?
  - Defecography studies
  - Western commode, Western commode with 10 cm stool, lowered height of the commode to generate a squatting posture
  - Outcomes: defecation time, sense of completion
  - And the winner is… Squatting posture!

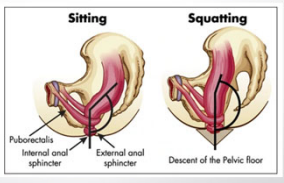
But why?

Reference: Mark Scott. The Physiology of Human Defecation. Dig Dis Sci (2012). PMID 22367113

Bowel movements: *Facts and Physiology*

- When hip flexion increases = creates a more obtuse (open) anorectal angle



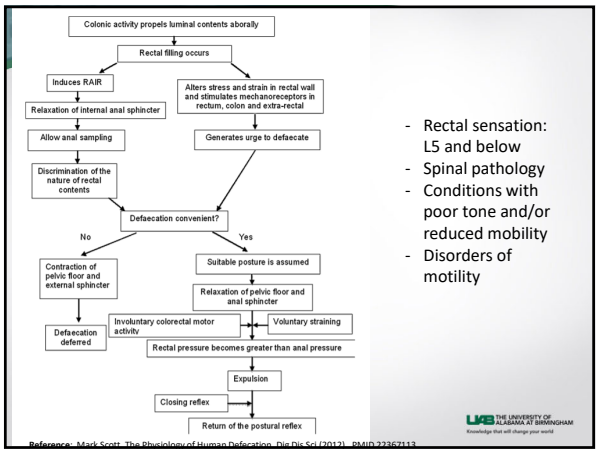


Reference: Mark Scott. The Physiology of Human Defecation. Dig Dis Sci (2012). PMID 22367113

Bowel movements: *Facts and Physiology*

- Gastro-colic reflex
  - When the stomach contracts → colon contracts
  - Two pressure peaks: 10-50 min, 70-90 min after a meal
- Recto-anal inhibitory reflex (RAIR)
  - Rectum distends → afferent nerves →spinal cord → efferent nerves → involuntary relaxation of internal anal sphincter

Reference: Mark Scott. The Physiology of Human Defecation. Dig Dis Sci (2012). PMID 22367113



- Rectal sensation: L5 and below
- Spinal pathology
- Conditions with poor tone and/or reduced mobility
- Disorders of motility

Reference: Mark Scott. The Physiology of Human Defecation. Dig Dis Sci (2012). PMID 22367113

Functional Constipation

- 3% prevalence
- 17-40% of cases occur in the first year of life
- Rome IV criteria (two or more of the following):
  - Straining
  - Lumpy, hard stools
  - Sensation of incomplete evacuation
  - Fewer than three SBM per week
  - Loose stools rarely present without laxatives
  - Insufficient criteria for irritable bowel syndrome

Evaluation and Treatment of Functional Constipation in Infants and Children: Evidence-Based Recommendations From ESPGHAN and NASPGHAN

M.M. Tabbers, C. DiLorenzo, M.Y. Berger, C. Faure, M.W. Langendam, S. Nurko, A. Staiano, Y. Vandenplas, and M.A. Benninga

- "To assist health care workers in the management of all of the children with constipation in primary, secondary, and tertiary care, the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition elected to develop evidence-based guidelines as a joint effort.

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Evaluation and Treatment of Functional Constipation in Infants and Children: Evidence-Based Recommendations From ESPGHAN and NASPGHAN

M.M. Tabbers, C. DiLorenzo, M.Y. Berger, C. Faure, M.W. Langendam, S. Nurko, A. Staiano, Y. Vandenplas, and M.A. Benninga

- It is intended to serve as a general guideline and should not be considered a substitute for clinical judgment or used as a protocol applicable to all patients.
- The guideline is also not aimed at the management of patients with underlying medical conditions causing constipation, but rather just for functional constipation.

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Goal: address 9 clinical questions

Question 1: What is the definition of functional constipation?
Question 2: What are the alarm signs and symptoms that suggest the presence of an underlying disease causing the constipation?
Question 3: In the diagnosis of functional constipation in children, what is the diagnostic value of
Question 4: Which of the following diagnostic tests should be performed in children with constipation in order to diagnose an underlying disease?
Question 5: Which of the following examinations should be performed in children with intractable constipation to evaluate pathophysiology and diagnose an underlying abnormality?
Question 6: What is the additional effect of the following nonpharmacologic treatments in children with functional constipation?
Question 7: What is the most effective and safest pharmacologic treatment in children with functional constipation?
Question 8: What is the efficacy and safety of novel therapies for children with intractable constipation?
Question 9: What is the prognosis and what are prognostic factors in children with functional constipation?

Answered based on expert opinions and previously published guidelines

Answered using the results of a systematic literature search

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Question 1: What is the definition of functional constipation?

- Two or more of the following
  - Straining with more than 25% of defecations
  - Lumpy or hard stools
  - Sensation of incomplete evacuation
  - Fewer than 3 spontaneous bowel movements/week
  - Loose stools are rarely present without laxatives

Note: paper based on Rome III. We now have Rome IV

Reference: theromefoundation.org/rome-iv/rome-iv-criteria/

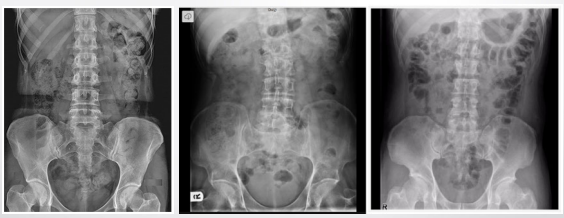
Question 1: What is the definition of functional constipation?

- Intractable constipation:
  - constipation not responding to optimal conventional treatment for at least 3 months
- Fecal impaction:
  - hard mass in the lower abdomen identified on physical exam
  - dilated rectum filled with large amount of stool on rectal exam
  - Excessive stool in the distal colon on abdominal radiography

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Question 1: What is the definition of functional constipation?

- Diagnosis of functional constipation should be based on history and physical exam



Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Question 2: What are the alarm signs and symptoms that suggest the presence of an underlying disease causing the constipation?

- "The major role of history and physical examination in the evaluation of constipation is to exclude other disorders that present with difficulties with defecation and to identify complications."

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Question 2: What are the alarm signs and symptoms that suggest the presence of an underlying disease causing the constipation?

Things to ask patient and family:

- Age of onset of symptoms
- Toilet training
- Frequency/consistency of stools
- Pain or bleeding with stools
- Abdominal pain
- Soiling
- Withholding behavior
- Dietary history
- Changes in appetite
- Nausea, vomiting
- Weight loss
- Psychosocial history
- Family history

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Question 2: What are the alarm signs and symptoms that suggest the presence of an underlying disease causing the constipation?

Physical exam:

- Abdomen (masses, distension)
- Perianal exam (anal position, stool, skin tag, anal fissure)
- Lumbosacral exam (dimple, tuft of hair, gluteal cleft deviation, etc.)
- Rectal exam (stenosis, fecal mass)

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Question 3: In the diagnosis of functional constipation in children, what is the diagnostic value of
3.1 Digital rectal examination?
3.2 Abdominal radiography?

Digital Rectal Exam (DRE)

- Evidence does not support use of DRE for diagnosing functional constipation

Abdominal radiography

- Evidence does not support use of abdominal radiography to diagnose functional constipation

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Question 4: Which of the following diagnostic tests should be performed in children with constipation in order to diagnose an underlying disease?

Labs

- Allergy testing (milk protein)? Evidence inconclusive
- Celiac and thyroid disease screening, calcium levels? No published evidence

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

So, when do I check labs?

- Typically **not** on the first visit (unless history concerning for celiac, thyroid disease)
- If laxative management does not improve symptoms (good compliance)
- Labs: TTG IgA, serum IgA, TSH/T4, renal panel

Question 5: Which of the following examinations should be performed in children with intractable constipation to evaluate pathophysiology and diagnose an underlying abnormality?

MRI of the Spine

- No evidence to support use of MRI of the spine in patients unless other neurological abnormalities present

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Question 6: What is the additional effect of the following nonpharmacologic treatments in children with functional constipation?

Fiber

- No evidence to support use of fiber supplements in treating functional constipation

Fluid

- No evidence to support use of extra fluid intake in treating functional constipation

Probiotics

- No evidence to support the use in the treatment of functional constipation

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

GUT MICROBIOTA AND THE USE OF PROBIOTICS IN CONSTIPATION IN CHILDREN AND ADOLESCENTS: SYSTEMATIC REVIEW

[Article in English, Portuguese]
Daiane Oliveira Vale San Gomes [1], Mauro Batista de Morais [1]
Affiliations + expand
PMID: 31778407 PMCID: PMC6909257 DOI: 10.1590/1984-0462/2020/38/2018123
Free PMC article

- Systematic review in children
- 2019
- Some benefits: abdominal pain, stool consistency, bowel frequency
- Bottom line: evidence still insufficient to recommend routine use

Reference: Oliveria and Batista de Morais. Rev Paul Pediatr. 2019 Nov 25. PMID 31778407

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Effectiveness of Probiotics in Children With Functional Abdominal Pain Disorders and Functional Constipation: A Systematic Review

Carrie A M Wegh [1, 2], Marc A Benninga [2], Merit M Tabbers [2]
Affiliations + expand
PMID: 29782469 DOI: 10.1097/MCG.0000000000001054

- Systematic review in children with functional constipation or functional abdominal pain
- 2018
- *Lactobacillus rhamnosus* GG (Culturelle): reduction in abdominal pain in children with IBS
- Bottom line: insufficient evidence for use in functional constipation

Reference: Wegh, Benninga, Tabbers. J Clin Gastroenterol. Dec 2018. PMID 29782469

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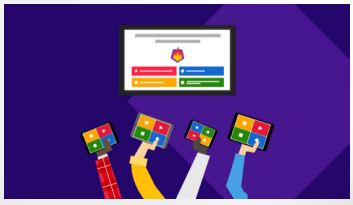

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Question 7: What is the most effective and safest pharmacologic treatment in children with functional constipation?

Best medication for fecal disimpaction (clean out)?

- Polyethylene glycol and enemas equally effective

Best medication for maintenance?

- Polyethylene glycol or lactulose
- Enema use discouraged long term

How long should you treat for?

- Minimum of 2 months (expert opinion only)
- Symptoms resolved for 1 month
- Gradually come off laxatives

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

TABLE 6. Dosages of most frequently used oral and rectal laxatives

Oral laxatives	Dosages
Osmotic laxatives	
Lactulose	1–2 g/kg, once or twice/day
PEG 3350	Maintenance: 0.2–0.8 g · kg^{-1} · day^{-1}
PEG 4000	Fecal disimpaction: 1–1.5 g · kg^{-1} · day^{-1} (with a maximum of 6 consecutive days)
Milk of magnesia (magnesium hydroxide)	2–5 y: 0.4–1.2 g/day, once or divided 6–11 y: 1.2–2.4 g/day, once or divided 12–18 y: 2.4–4.8 g/day, once or divided
Fecal softeners	
Mineral oil	1–18 y: 1–3 mL · kg^{-1} · day^{-1}, once or divided, max 90 mL/day
Stimulant laxatives	
Bisacodyl	3–10 y: 5 mg/day >10 y: 5–10 mg/day
Senna	2–6 y: 2.5–5 mg once or twice/day 6–12 y: 7.5–10 mg/day >12 y: 15–20 mg /day
Sodium picosulfate	1 mo–4 y: 2.5–10 mg once/day 4–18 y: 2.5–20 mg once/day
Rectal laxatives/enemas	
Bisacodyl	2–10 y: 5 mg once /day >10 y: 5–10 mg once /day
Sodium docusate	<6 y: 60 mL >6 y: 120 mL
Sodium phosphate	1–18 y: 2.5 mL/kg, max 133 mL/dose
NaCl	Neonate <1 kg: 5 mL, >1 kg: 10 mL >1 y: 6 mL/kg once or twice/day
Mineral oil	2–11 y: 30–60 mL once/day >11 y: 60–150 mL once/day

PEG = polyethylene glycol.

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

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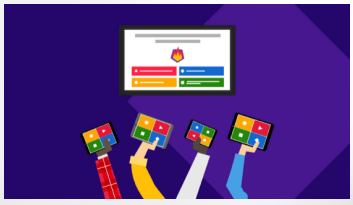


Question 7: What is the most effective and safest pharmacologic treatment in children with functional constipation?

- What do you do if you suspect a fecal impaction?

Clean Out Regimen Options *(Goal: transparent liquid stools without sediment)*

Option 1:	*Enemas Only*:	Age < 2 y/o: Peds Fleets enema daily x 3 days; Age > 2 y/o: Adult fleets enema daily x 3 days; may need 1-2 additional days
Option 2:	*Enemas + Miralax*:	Mineral oil enema, Fleets enema followed by Miralax q 30 min to 1 hour for 4 hours
Option 3:	*Oral laxatives only*:	8 am to 8 pm, clear liquid diet (eat BF before 8 am, dinner after 8 pm) 0800 and 2000: dulcolax/senna + miralax; 1000, noon, 1400, 1600, 1800: miralax only (**max of 2 consecutive days)*
Option 4:	*Oral laxatives only*:	Senna + Miralax + Senna (over 2 hours). 1 day only

Principles of Management

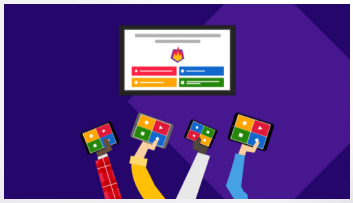
- Aggressive bowel regimen
- Identify when to pursue clean out (soiling)
- Good communication
- Frequency of visits
- Parental compliance at home

Principles of Management

- https://naspghan.org/files/documents/pdfs/medical-resources/Constipation_Care_Package.pdf

- Physician resources
- Nursing resources
- Parent resources

Kahoot!



Question 9: What is the prognosis and what are prognostic factors in children with functional constipation?

- General
  - ~80% of children treated early will be laxative free by 6 months
  - ~32% (if treatment is delayed)
  - 50-60% recovery rate after 1 year of intensive treatment

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Question 9: What is the prognosis and what are prognostic factors in children with functional constipation?

- After GI referral
  - 50% will recover (defined as having 3 bowel movements per week without fecal incontinence) and be without laxatives after 6 to 12 months
  - 40% will still be symptomatic despite use of laxatives
  - 10% will do well but remain on laxatives

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

Question 9: What is the prognosis and what are prognostic factors in children with functional constipation?

- Prognostic factors?
  - No real evidence to identify strong prognostic factors (positive or negative)
  - In general, patients with duration of symptoms <3 months before presentation do better long term

Reference: Tabbers et al. J Pediatr Gastroenterol Nutr. 2014. PMID 24345831

When to refer?

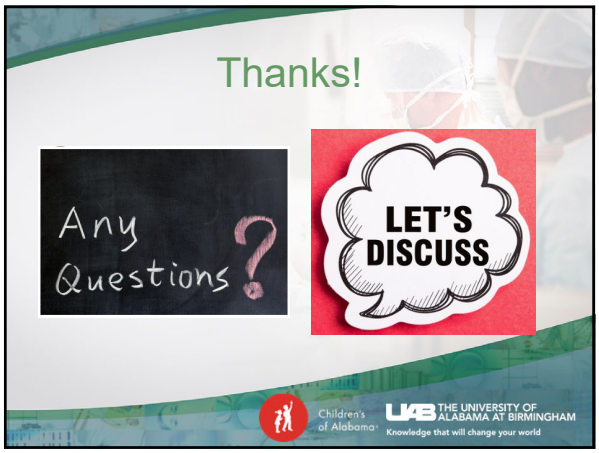
- Red flags present
- Initial management attempts have come up short
- Patient with comorbidities (cerebral palsy, poor mobility/motility, genetic syndromes, non verbal, phobias with using the toilet, etc.)
- Family request
- You are just worried

When to refer?

- https://www.childrensal.org/patient-referral

Gastroenterology, Hepatology and Nutrition

- All new patient appointments get scheduled through the Patient Access Center. A physician makes a referral, by filling out the Referral Form and faxing it to **205-638-9919**, along with a Medicaid Referral (if this applies).
- If referring a patient for constipation the PCP Constipation Referral Checklist must be included.
- Fax all relevant* records, labs and imaging | **205-638-9919**


Thanks!
Any Questions?
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