# Treatment for Pediatric Functional Constipation

Marissa Koven, MA and Linda Nicolotti, PhD

PG-SIG Case Conference

6-6-22

#### **Articles**

#### Last Month's Journal Article:

- Lamparyk, K., Mathis, M., Piorkowski, L., Polasky, S., Gross, M., & Feinberg, L. (2022).
   Development and evaluation of an interdisciplinary group intervention for pediatric functional constipation. Clinical Practice in Pediatric Psychology.
  - https://doi.org/10.1037/cpp0000435

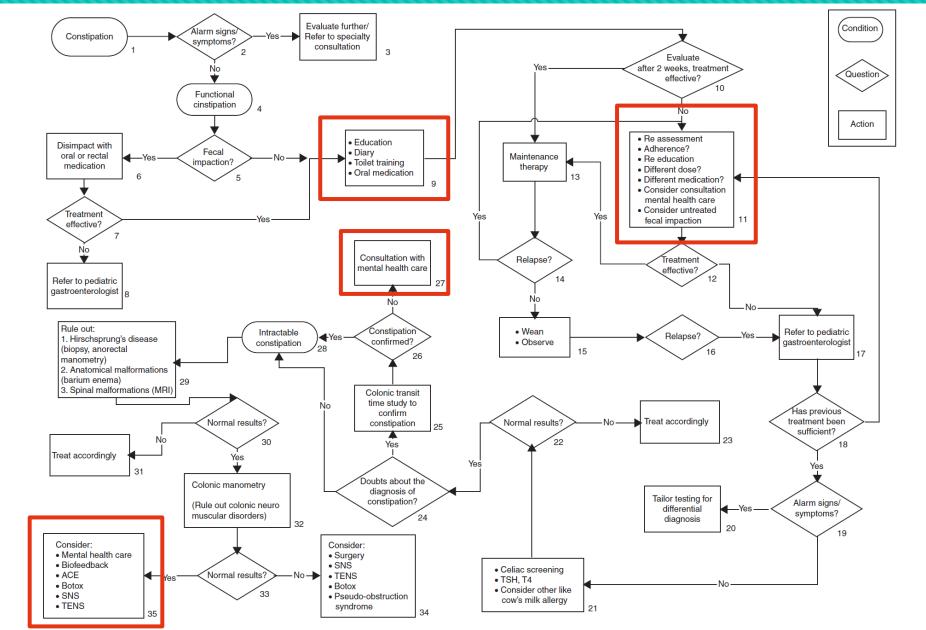
#### Our Clinical Case Conference Article:

- Thompson, A. P., Wine, E., MacDonald, S. E., Campbell, A., & Scott, S. D. (2021). Parents' experiences and information needs while caring for a child with functional constipation: a systematic review. Clinical Pediatrics, 60(3), 154-169.
  - https://journals.sagepub.com/doi/10.1177/0009922820964457

# Psychosocial Treatment of Pediatric Constipation with Special Attention To Caregiver Needs

• Based on clinical recommendations from NASPGHAN and ESPGHAN, the primary role for psychological support may lie in the "demystification, explanation, and guidance for toilet training (in children with a developmental age of at least 4 years) in the treatment of childhood constipation"

(Tabbers et al., 2014)



**FIGURE 2.** Algorithm for the evaluation and treatment of infants  $\geq 6$  months of age. ACE = antegrade continence enema; MRI = magnetic resonance imaging; SNS = sacral nerve stimulation; TENS = transcutaneous electric nerve stimulation; TSH = thyroid-stimulating hormone.

# Considerations for Initiating Treatment: Profound and Pervasive Effects

- Functional constipation is common but often undertreated in primary care
- Symptoms often present months or years before families seek help and the burden of FC is significant
  - HRQoL of caregivers and family functioning may be negatively impacted
  - Caregiver distress and worry about social impact may be high, particularly if fecal incontinence
- Caregivers may be frustrated by a lengthy timeline before receiving a clear, explicitly communicated diagnosis of functional constipation
  - They may feel that their child's FC has gone unrecognized, dismissed, or their concern is an overreaction to a benign concern
- Need to have an attentive and supportive stance for rapport building

# Treatment of Pediatric Constipation with Special Attention To Caregiver Needs

- Initiation of treatment
  - Explanation of a biopsychosocial model of care
    - Address medical, emotional, behavioral factors in functional constipation and toileting challenges
  - Pediatric GI performs medical examination: stool burden, order additional testing if needed, adjust medications (i.e., cleanout regimen if needed)
  - Psychologist performs psychosocial history and provides education on bowel movements
    - Orient child and caregivers to goals of work together and initial treatment planning

- Therapeutic Recommendations for Children with Constipation – Evidence-Based Recommendations from ESPGHAN and NASPGHAN
  - O Normal fiber intake, fluid intake, physical activity
  - Not recommended: routine use of prebiotics, probiotics, biofeedback
  - First Line Treatment
    - Polyethylene Glycol (PEG) with or without electrolytes for fecal impaction
    - O Daily enemas, if PEG not available,
  - First Line Maintenance
    - PEG with or without electrolytes
    - Lactulose if PEG unavailable
  - Additional or Second Line Treatments
    - Milk of magnesia, mineral oil, stimulant laxatives
  - Maintenance treatment should continue for at least 2 months with all symptoms resolved for at least 1 month before discontinuation; treatment decreased gradually

#### Medical Guidelines and Recommendations for Treatment

### Psychosocial History

- Establish duration of symptoms and treatment course to date
  - Recognize cumulative effects of FC on a child, parents, and family unit and how that may contribute to parents' reluctance to seek medical help
    - Assess for shame, embarrassment and guilt (common barriers)
    - O Allow parents to openly discuss FC symptoms-physical, psychological, social, financial and family functioning effects
- Identify concerns associated with FC (e.g., child's social well-being, financial)
- Developmental history (e.g., developmental delay, intellectual disability, autism)
- Mental health history (e.g., anxiety: fears/phobias; trauma: sexual abuse; depression; eating disorder)
- O Social history (e.g., changes: school, home, family; travel)
- Behavioral history (e.g., concerns with compliance, tantrums etc.)
- Medical history (e.g., new medicines, diet changes, fissure)
- O Toileting History (e.g., stage in potty training, impaction, encopresis, leaking, urinary incontinence)

#### **Precarious Footing and Initial Education**

- O Caregivers may come in with a combination of accurate knowledge, information gaps, and misinformation about condition and treatment
  - O May also have feelings of guilt or shame and have received mixed messages from care providers
- Providing adequate information is a necessity and leads to better outcomes: handouts!
- Regardless of time since dx, parents should be offered detailed teaching about pathophysiology of FC, with particular attention to explaining episodes of soiling
  - $\supset$  Some parents believe fecal incontinence is caused by negative personality traits or intentional misbehavior  $\rightarrow$  dismissive attitude
    - O Think child is lazy or not trying hard enough
    - O Soiling is deliberate act of defiance or done to gain attention
    - Parents feeling shame for child's condition, may avoid discussing with peers or health care providers
    - O Connected to response style of "blame and punish"
- Education on etiology of functional constipation
  - Interplay between medical and behavioral/emotional factors
  - Self-reinforcing cycle

# Initial Education and Doubts About Medications

- Educate on bowel movements
  - Frequency and consistency
- Reinforce pharmacological recommendation from GI
  - High rates of nonadherence to PEG treatment
  - Ensure parental understanding of medication use and safety
  - Parents frequently have unanswered questions about whether long-term laxative use would cause dependence and may be ill-prepared to manage side effects or to titrate doses to achieve optimum results
  - Explore potential barriers to medication use
    - Emotional burden associated with medication use as source of parent-child conflict
    - Recognize parental level of health literacy
    - Low treatment satisfaction related to side effects of medication (e.g., orange liquid discharge related to mineral oil)
  - Explicitly consider larger contextual influences family dynamics, school or work timing, financial resources etc.
    - May offer greater parental sense of control and improve ability to implement complex treatment plans

#### **Initial Education and Tracking**

#### Discuss treatment process in a shared decision-making approach

- Ultimate goal: eliminate accidents an develop independent toileting
- Other short-term goals: tracking BM, shaping toileting behaviors

Teach families to monitor and record the child's bowel movements

Team effort

Poop Journal



#### YOUR HANDY-DANDY DOO-DOO DOCUMENT

Keeping track of your kid's digestive habits is easy. And knowing what movement abnormalities to look for helps you identify and remedy potential issues

#### **HOW TO USE THIS CHART**

- 1. This chart is intended to help you record and classify your child's stools so that it is easier to look back over several weeks and identify emerging patterns.
- 2. On the journal below, record the type of stool your child had with a simple 1-7 (that corresponds to the scale and the time of day).
- . Your child's frequency and stool type can vary because of a range of factors, but ideally, your child's stool should be in the Type 3 to Type 5 range, and should be occurring on a fairly consistent pattern.

Week of:			
	morning	midday	evening
MON			
TUES			
WED			
THUR			
FRI			
SAT			
SUN			

Week of:			
	morning	midday	evening
MON			
TUES			
WED			
THUR			
FRI			
SAT			
SUN			

Week of:				We
	morning	midday	evening	
MON				N
TUES				TI
WED				٧
THUR				Ti
FRI				F
SAT				S
SUN				S

Week of:			
	morning	midday	evening
MON			
TUES			
WED			
THUR			
FRI			
SAT			
SUN			



BRIST
0,0
£
(3) Pu =



IL STOOL FORM SCALE













This chart was not designed to diagnose children's constipation. This chart is merely a tool to help keep track of daily activity. Please share this information with a physician should you have any concerns. This chart is also available for download on www.pedia-lax.com.

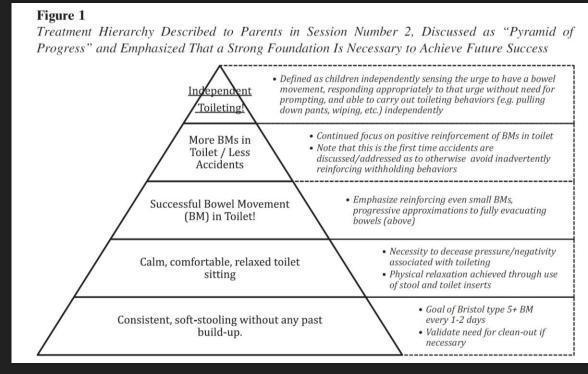


(Lamparyk et al., 2022)

## Overview of Treatment Approach

- A) Regular soft bowel movements
- B) Positive and relaxed toilet sits
- O C) Successful BM in toilet
- O D) Reducing and eliminating accidents
- E) Independent toileting

#### Treatment Hierarchy

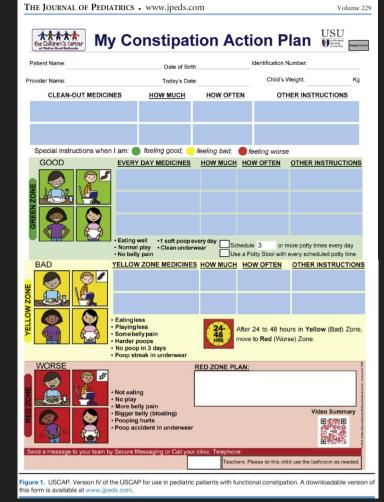


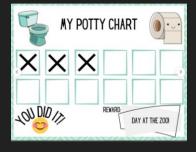
(Lamparyk et al., 2022)

### **Caregiver Education**

- Goal: Consistent soft bowel movements without build up
- Goal: Positive and relaxed toilet sits
  - Develop toilet sitting schedule
  - Teach behavioral reinforcement strategies to address challenging behaviors
    - Eliminate potentially punishing consequences related to toileting as they inadvertently reinforce withholding behaviors
      - Guilt/shame
      - Punishment or over attending to accidents
      - Significant pressure for toileting
  - Model relaxed approach to toileting
  - Increase reinforcement strategies
    - Affirming language related to toileting behaviors
    - Tangible reinforcements as needed
      - Books or activities during toileting time
      - Earning tangible reward for appropriate toileting behaviors (reward chart)

(Lamparyk et al., 2022)







(Reeves et al., 2021)

# Considerations for Supporting Caregivers

- Caregivers may feel parental guilt, self-blame or shame related to child's FC
  - May feel judged by others: family, friends, teachers, other health care providers
  - May have received implicit or explicit suggestion that parent bares responsibility
- O Behavioral interventions can be taxing and lead to frustration
  - Parents often feel emotionally overwhelmed and lack of support when implementing
    - O Familial conflict- child noncompliance and refusal in response to toilet routine and subsequent parental anger
- Enormous pressure to continuously monitor child's BM while balancing increased costs and time associated with laundry, behavioral interventions, attending appointments and administering medications
  - Feeling of all-consuming
- Children respond to treatment better when parents are less stressed
  - Importance of acknowledging and addressing parents' needs for support
- Interdisciplinary care models with more frequent visits and as-needed contact with health care providers during symptomatic exacerbations or periods of uncertainty show promise

# Caregiver Education and Support

- Goal: Instill hope and continued engagement
  - Mechanics of having a BM
  - Factors contributing to soft, comfortable BM
    - Stool, child-insert
    - Relaxed sphincter
  - Appropriate muscles (lower abdominal) for "pushing" out stool
  - Strategies of "blowing" to engage muscles

# Caregiver Education and Support

- Goal: Instill hope and continued engagement
  - Overview of dietary and medication guidance for managing constipation
    - Mechanism of action of Polyethylene Glycol
    - Common misconceptions on the importance of dietary recommendations
      - No support for regular use of fiber supplementation or eliminating specific food groups
    - O Families may overestimate the role of diet-fiber and fluid intake in treatment
      - O Beliefs may stem from media, family, friends and other health care providers
    - O If there are dietary recommendations consider
      - O Difficulty applying dietary knowledge (e.g., Understanding fiber level of foods)
      - Practical challenges to implementing dietary changes (e.g., )Child refusal to eat certain foods
    - Inform of more advanced intervention options
      - E.g., anorectal manometry with biofeedback, adjunctive medication or exposure therapy targeting persistent toileting anxiety

### Caregiver Education and Support

**Goal**: Encourage independent problem solving and confidence in managing high-relapse-prone situations

- Introduce problem solving strategies
- Discuss hypothetical situations that may come up
  - O Brainstorm list of common situations
    - Focus on factors that alter or negatively impact the child's diet, stress, and/or routine
  - Brainstorm ideas for how to handle situations
    - Prevention vs proactive responsiveness

- Reinforce general treatment guidelines
  - Continued monitoring of BM patterns and proactive behavioral and pharmacologic treatment to avoid future fecal impaction
- Review behavioral plan and modify as needed

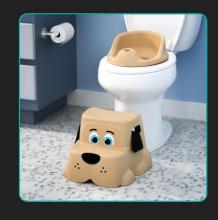
### **Education for Children**

#### O Goals:

- Increase motivation to engage in appropriate toileting behaviors and increase their likelihood of successful BMs
- Decrease withholding behaviors
- Increase cooperation and relaxation during scheduled sitting time
- Engage lower abdominal muscles to "blow out poop" by using bubbles and pinwheels

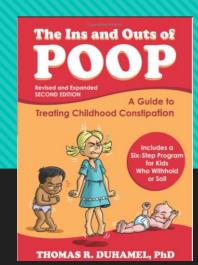
(Lamparyk et al., 2022)

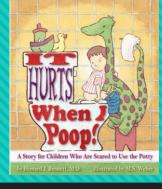


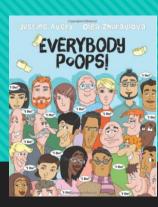




### **Education for Children**





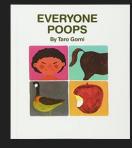


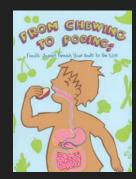
#### Education Topics:

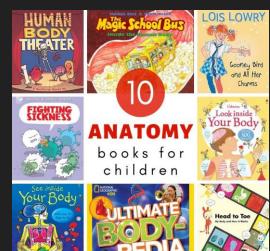
- O Structure and function of the GI system
- "Where poop comes from"
- Normalize experience of pooping
- Complications of withholding bowel movements
- O Stool consistency and how to use the Bristol Stool Chart
- O Importance of regular BM to prevent pain and discomfort
- Mechanics of having a BM
- Factors contributing to soft, comfortable BM
- O Dietary factors
- Liquid consumption
- Medication adherence
- O Muscular relaxation strategies

(Lamparyk et al., 2022)



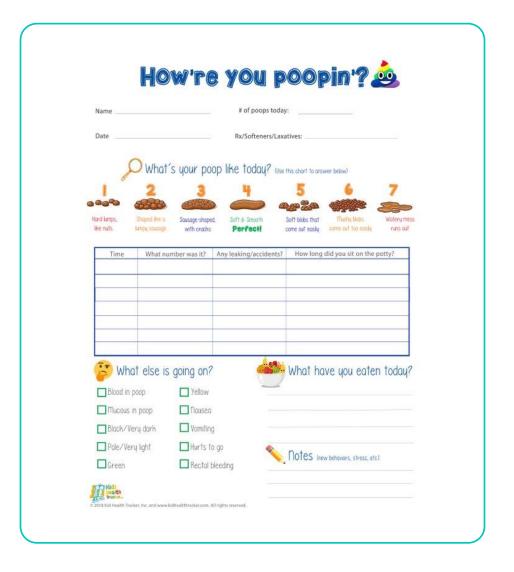






# Education for Children

- Goal: Increase motivation to engage in appropriate toileting behaviors and increase their likelihood of successful BMs
  - Teach active coping strategies for tolerating scheduled toilet sits (e.g., distraction)
  - Teach relaxation strategies for relaxed muscles during scheduled sits
  - Teach toileting behavior plan collaboratively developed with caregivers



KidHealth Tracker - Etsy

# Child Education and Support



REVIEW PREVIOUSLY LEARNED MATERIAL AND BEHAVIORAL REINFORCEMENT STRATEGIES TO SUPPORT MOTIVATION AND ADHERENCE TO BEHAVIORAL AND PHARMACOLOGICAL RECOMMENDATIONS



REINFORCE TREATMENT GAINS

# Treatment Components for FC

#### Empathy with challenges/listen to story

#### Psychoeducation – child and caregivers

- Physiology related to constipation
- Bristol Stool Chart
- Behavior monitoring and recording
- Constipation management and rationale (toilet sitting regimen, potty posture)
- Behavior management
- Parents role in treatment process

Anticipating and problem-solving regarding challenges with caregiver

Addressing adherence and consistency

# Treatment Components for FC

#### **CBT**

- Relaxation training belly breathing
- Exposure therapy for anxiety
- Cognitive therapy for fears
- Use of behavior modification chart
- Shaping
- Management of oppositional behavior

Dietary/hydration

Exercise

School accommodations

6 yo Caucasian female

Lives with maternal great great grandmother

Rising 1st grader

New patient presenting to Pediatric GI Clinic for management of constipation and encopresis

- Risk Factors
  - Maternal prenatal substance use
  - Sexual abuse at 5 yo
  - Separation Anxiety
  - Caregiver has poor boundaries
  - Caregiver lacks education about treatment of constipation and behavior management/resistance
  - Great great grandfather history of alcoholism and deceased
  - O Duration of issue
  - Acid reflux history

- Protective Factors
  - O Has lived with caregiver since birth
  - Good grades
  - O Has friends
  - History of prior counseling
  - Motivated to seek help at present
  - Patient seems motivated by rewards
  - Compliant with medical regimen to date

- Toileting History
  - Urinate in toilet wnl
  - O Has only had BM in the toilet 1-2 times with "bribe."
  - Constipation since infancy leading to pain with BM and withholding
  - OBM elimination in bedroom under blanket in underwear
- O Related Issues: Intermittent nausea, vomiting, abdominal pain

# GI assessment and Work-up

Rule out pelvic floor dyssynergia

Abdominal x-ray

Rule out IBD, H Pylori, celiac, pending x-ray

Will avoid use of suppositories, enemas, and ARM procedure

### For Discussion:

• What family factors may need to be considered for successful management of this case of FC?

- 7 yo Caucasian male
- Lives with parents and older brother
- First grade
- Constipation with overflow incontinence
  - Encopresis
  - Associated lower abdominal pain
- New patient presenting to Pediatric GI Clinic
- 1 counseling session when younger for oppositional behavior

- Risk Factors
  - Oppositional behavior/aggression
  - O Does not drink enough fluids
  - Not attending school
  - O Does not like water/not enough fluids

- Protective Factors
  - Takes fiber supplement
  - Eats fruit
  - O Takes Miralax
  - Intact, supportive family
  - O Good grades
  - Friends
  - Typical age-appropriate activities

- O Toileting Concerns
  - O BM is not formed
  - 4-year history of toileting issues
  - Resistant to using the bathroom for BM
  - Does not know when he needs to have BM
  - Refuses to have BM at school; says bathroom is "dirty."
  - Per mother, BM accidents are difficult to clean up and burdonsome
  - Fear of soiling self at school;
     withholding at school
  - O Decreased HRQOL
  - Does not have daily BM
  - Nocturnal enuresis

# Case 2: GI Assessment and Work-up

Rule out pelvic floor dyssynergia with anorectal manometry

Screening bloodwork to rule out thyroid dysfunction, celiac disease, and IBD

Daily Miralax

Monthly clean-outs

### For Discussion:

OWhat family/caregiver factors are important to address during the management of this patient's constipation?

# Case 2 Treatment Outcome

3 session with GI and 2 session with Pediatric Psychology

SUCCESS: After 3-4 months of compliance with toileting and constipation regimen, encopresis, withholding, abdominal pain, nocturnal enuresis resolved

Referral to pelvic floor PT to address pelvic floor dyssynergia

# Discussion Questions



What are some strengths related to implementing a group treatment for FC? (Lamparyk et al., 2022)



What are some challenges for a group format for FC?



How might the group format (Lamparyk et al., 2022) be adapted for individual work?



How can the benefits of a multidisciplinary team be incorporated when doing individual treatment (GI provider, behavioral health, nutrition) for FC?



How to ensure that family/caregiver needs are addressed during treatment of FC?

#### References

- Lamparyk, K., Mathis, M., Piorkowski, L., Polasky, S., Gross, M., & Feinberg, L. (2022). Development and evaluation of an interdisciplinary group intervention for pediatric functional constipation. Clinical Practice in Pediatric Psychology. <a href="https://doi.org/10.1037/cpp0000435">https://doi.org/10.1037/cpp0000435</a>
- Reeves, P. T., Kolasinski, N. T., Yin, H. S., Alqurashi, W., Echelmeyer, S., Chumpitazi, B. P., ... & Nylund, C. M. (2021). Development and assessment of a pictographic pediatric constipation action plan. The Journal of pediatrics, 229, 118-126. <a href="https://doi.org/10.1016/j.jpeds.2020.10.001">https://doi.org/10.1016/j.jpeds.2020.10.001</a>
- O Tabbers, M. M., DiLorenzo, C., Berger, M. Y., Faure, C., Langendam, M. W., Nurko, S., ... & Benninga, M. A. (2014). Evaluation and treatment of functional constipation in infants and children: evidence-based recommendations from ESPGHAN and NASPGHAN. Journal of pediatric gastroenterology and nutrition, 58(2), 258-274.
- Thompson, A. P., Wine, E., MacDonald, S. E., Campbell, A., & Scott, S. D. (2021). Parents' experiences and information needs while caring for a child with functional constipation: a systematic review. Clinical Pediatrics, 60(3), 154-169. <a href="https://journals.sagepub.com/doi/10.1177/0009922820964457">https://journals.sagepub.com/doi/10.1177/0009922820964457</a>

#### **Education Resources**

- Parental Opinions of Pediatric Constipation Questionnaire <a href="https://pubmed.ncbi.nlm.nih.gov/25840448/">https://pubmed.ncbi.nlm.nih.gov/25840448/</a>
- Pictographic Pediatric Constipation Action Plan <a href="https://doi.org/10.1016/j.jpeds.2020.10.001">https://doi.org/10.1016/j.jpeds.2020.10.001</a>
  - O Example <a href="https://wrnmmc.libguides.com/ld.php?content-id=57110850">https://wrnmmc.libguides.com/ld.php?content-id=57110850</a>
- "The Poo in You" Video <a href="https://www.youtube.com/watch?v=SgBj7Mc\_4sc">https://www.youtube.com/watch?v=SgBj7Mc\_4sc</a>
- https://gikids.org/
  - Constipation Fact Sheet: <a href="https://www.gikids.org/files/documents/digestive%20topics/english/Constipation.pdf">https://www.gikids.org/files/documents/digestive%20topics/english/Constipation.pdf</a>
- Constipation: A Parent's Guide <u>https://www.stlouischildrens.org/sites/default/files/SLC23212</u> Constipation%20Booklet 2016.pdf
- Constipation Care Package <a href="https://naspghan.org/files/documents/pdfs/medical-resources/Constipation\_Care\_Package.pdf">https://naspghan.org/files/documents/pdfs/medical-resources/Constipation\_Care\_Package.pdf</a>
  - O Bowel Management Tracking Tool: <a href="https://indd.adobe.com/view/e3933310-a8fd-4106-be8c-ebd1baabeb2e">https://indd.adobe.com/view/e3933310-a8fd-4106-be8c-ebd1baabeb2e</a>
- O UpToDate Patient education: Constipation in infants and children (Beyond the Basics) <a href="https://www.uptodate.com/contents/constipation-in-infants-and-children-beyond-the-basics/print">https://www.uptodate.com/contents/constipation-in-infants-and-children-beyond-the-basics/print</a>
- Self-Regulation Skills: Breathing Strategies: <a href="https://challengingbehavior.cbcs.usf.edu/docs/Smell-Blow.pdf">https://challengingbehavior.cbcs.usf.edu/docs/Smell-Blow.pdf</a> Kids Stool Chart: <a href="https://natmed.com.au/wp-content/uploads/2021/10/Kids-Stool-Chart.pdf">https://natmed.com.au/wp-content/uploads/2021/10/Kids-Stool-Chart.pdf</a>

#### **Book Resources**

- The Ins and Outs of Poop: A Guide to Treating Childhood Constipation by Thomas R. Duhamel, PHD
- O It Hurts When I Poop!: A Story for Children Who Are Scared to Use the Potty by Howard J. Bennett, MD
- Everybody Poops! By Justine Avery and Algo Zhuravlova
- Everyone Poops by Taro Gomi
- From Chewing to Pooing: Food's Journey Through Your Body to the Potty by Lauren Gehringer and Dr. Natalie Gehringer
- Child Anatomy Books: Adventure-in-a-Box.com
  - O The Magic School Bus: Inside the Human Body by Joanna Cole
  - O Gooney Bird and All Her Charms by Lois Lowry
  - Human Body Theater by Maris Wicks
  - Fighting Sickness by Joseph Midthun
  - Look Inside Your Body by Louie Stowell
  - Head to Toe: My Body and How It Works by Sophie Dauvois
  - O Ultimate Body-pedia: An Amazing Inside-out Tour of the Human Body by Christina Wilsdon, Jen Agresta, and Patricia Daniels
  - See Inside Your Body by Colin King and Katie Daynes

### **Toileting Resources**

- O How're you poopin'?: Printable Poop Diary Journal for Kids from KidHealthTracker on Etsy:

  https://www.etsy.com/listing/605976695/printable-poop-diary-journal-forkids?gpla=1&gao=1&&utm\_source=google&utm\_medium=cpc&utm\_campaign=shopping\_us\_ecraft\_supplies\_and\_tools-storage\_and\_organizationother&utm\_custom1=\_k\_CjwKCAjw7vuUBhBUEiwAEdu2pPANH8F1b0GHjZi0FiSP-thu1Yqtw-9FKIR1ceu5kqKU7zo6PLIXRoCwAEQAvD\_BwE\_k\_&utm\_content=go\_1843970776\_69216029465\_346364370600\_pla295474483187\_c\_605976695\_12768591&utm\_custom2=1843970776&gclid=CjwKCAjw7vuUBhBUEiwAEdu2pPANH8F1b\_
  0GHjZi0FiSP-thu1Yqtw-9FKIR1ceu5kqKU7zo-6PLIXRoCwAEQAvD\_BwE
- Poop Journal: <a href="https://throughtheyearspediatrics.com/Medical-Content/Poop\_Journal.aspx">https://throughtheyearspediatrics.com/Medical-Content/Poop\_Journal.aspx</a>
- My Potty Chart: <a href="https://www.etsy.com/listing/956172175/printable-potty-reward-chart-unisex?gpla=1&gao=1&&utm\_source=google&utm\_medium=cpc&utm\_campaign=shopping\_us\_e-art\_and\_collectibles-prints-digital\_prints&utm\_custom1=\_k\_CjwKCAjw7vuUBhBUEiwAEdu2pFZb-ICSWiyWQKjBy\_3iNwIljN9IMb6liK2oVbP6CnhxEwS2lwuJmRoC2lgQAvD\_BwE\_k\_&utm\_content=go\_304499915\_2274621\_2675\_78727443155\_aud-1408996296215:pla-106555091555\_c\_956172175\_12768591&utm\_custom2=304499915&gclid=CjwKCAjw7vuUBhBUEiwAEdu2pFZb-ICSWiyWQKjBy\_3iNwIljN9IMb6liK2oVbP6CnhxEwS2lwuJmRoC2lgQAvD\_BwE</p>
- Potty Pet Dog Kid's Stool: <a href="https://www.squattypotty.com/products/potty-pet-dog-kids-stool">https://www.squattypotty.com/products/potty-pet-dog-kids-stool</a>
- Wooden Potty Stool with Footprints: <a href="https://www.amazon.com/DORPU-Squatting-Toilet-Bathroom-Capacity/dp/808VNK3Q4X">https://www.amazon.com/DORPU-Squatting-Toilet-Bathroom-Capacity/dp/808VNK3Q4X</a>