Pediatric Constipation

A Naturopathic Approach to Constipation in Children
Erika Krumbeck, ND, FABNP

Technical support:

Use Chat, or e-mail:
support@naturopathicpediatrics.com

CE certificates

Watch for an e-mail from
support@naturopathicpediatrics.com
Please fill out your questionnaires within 1 week in order to get your CE certificate.

Pediatric Constipation

A Naturopathic Approach to Constipation in Children
Erika Krumbeck, ND, FABNP

4-36%

of children have functional constipation.

3%

of all pediatrician referrals

25%

of gastroenterology specialist referrals

$3.9 billion

Annual costs in the U.S. to treat pediatric constipation

Naturopathic Pediatrics Guide to Assessing & Treating Children:

1. Is it **normal**? (Example: a 5-year old just entering Kindergarten may have transient constipation because they don't want to poop at school!)
2. Is the **diagnosis** correct? (Is it really celiac disease?)
3. What are the **resources** of the family? (Financial, emotional, support, etc.)
4. Give the **simplest, easiest (most affordable!) treatment** that meets the family where they are at.

What is normal?

- Babies 1 week old or less usually have 4 or more bowel movements each day. They are usually liquidy or extremely soft.
- Babies 3 months old or less can have bowel movements as often as several times per day, or as infrequent as once per week. Breastfed babies tend to have less frequent stools than formula fed babies. If babies are very uncomfortable when passing stool then this is still considered problematic. Note that most infants strain while having a bowel movement, and this is not considered abnormal.

What is normal?

- By age 2 most children have at least 1 bowel movement per day. They should be easy to pass, formed, no blood in the stool, not pellet-like. Ideal is at least 1 bowel movement per day (though it can be technically "normal" to go 2-3 days without defecating). [2]

What is “constipation?”

Rome IV criteria for the diagnosis of functional constipation in children

Infants and toddlers up to 4 years old	Children with developmental age of at least 4 years
At least two of the following present for at least one month	At least two of the following present at least once per week for at least one month*
Two or fewer defecations per week	Two or fewer defecations in the toilet per week
History of excessive stool retention	At least one episode of fecal incontinence per week
History of painful or hard bowel movements	History of retentive posturing or excessive volitional stool retention
History of large-diameter stools	History of painful or hard bowel movements
Presence of a large fecal mass in the rectum	Presence of a large fecal mass in the rectum
In toilet-trained children, the following additional criteria may be used:	History of large-diameter stools that may obstruct the toilet
At least one episode/week of incontinence after the acquisition of toileting skills	The symptoms cannot be fully explained by another medical condition.
History of large-diameter stools that may obstruct the toilet	

* In addition, the symptoms are insufficient to fulfill the diagnostic criteria of irritable bowel syndrome.

Data from:

1. *Benninga MA, Faure C, Hyman PE, et al. Childhood Functional Gastrointestinal Disorders: Neonate/Toddler. Gastroenterology 2016.*
2. *Hyams JS, Di Lorenzo C, Saps M, et al. Functional Disorders: Children and Adolescents. Gastroenterology 2016.*

Rome IV criteria for the diagnosis of functional constipation in children

Infants and toddlers up to 4 years old	Children with developmental age of at least 4 years
At least two of the following present for at least one month	At least two of the following present at least once per week for at least one month*
Two or fewer defecations per week	Two or fewer defecations in the toilet per week
History of excessive stool retention	At least one episode of fecal incontinence per week
History of painful or hard bowel movements	History of retentive posturing or excessive volitional stool retention
History of large-diameter stools	History of painful or hard bowel movements
Presence of a large fecal mass in the rectum	Presence of a large fecal mass in the rectum
In toilet-trained children, the followin additional criteria may be used:	History of large-diameter stools that may obstruct the toilet
At least o the acquis	The symptoms cannot be fully explained by another medical condition.
History of obstruct the toilet	

* In addition, the symptoms are insufficient to fulfill the diagnostic criteria of irritable bowel syndrome.

Data from:

1. *Benninga MA, Faure C, Hyman PE, et al. Childhood Functional Gastrointestinal Disorders: Neonate/Toddler. Gastroenterology 2016.*
2. *Hyams JS, Di Lorenzo C, Saps M, et al. Functional Disorders: Children and Adolescents. Gastroenterology 2016.*

Naturopathic perspective:

If they don’t fit the criteria, but the symptoms are bothersome - let’s work on it!

Other medical causes of constipation

Hirschsprung

- A.K.A. Congenital aganglionic megacolon. Lack of ganglion in the distal colon leaves the affected section of bowel non-functional.
- Approximately 20-25% of Hirschprung patients have other congenital anomalies. (Often genitourinary or anorectal)
- Most are diagnosed in neonatal period. Symptoms include **failure to pass meconium stool within 48 hours**. **(Passage of stool does not exclude the diagnosis, however!)**
- Other symptoms: bilious emesis, abdominal distension, explosive expulsion of gas or stool, fever or vomiting or sepsis-like picture. [5]

Cystic Fibrosis

- Neonatal screening is routine.
- Abnormal chloride and bicarbonate transport causes thick mucus and secretions, affecting lungs, digestive tract, pancreas and hepatobiliary system.
- Mucus blocks pancreatic ducts, which causes lack of exocrine pancreatic function. Leads to undigested food (from lack of pancreatic enzymes).
- Stools can be foul smelling, greasy, runny, or constipation/intestinal blockage can occur.
- Constipation occurs in 25-50% of CF patients! [6]

Cystic Fibrosis

- In addition to other issues, CF can cause **meconium ileus.** Meconium ileus presents within first 3 days of life. Symptoms: failure to pass meconium, abdominal distension. Blockage occurs in terminal ileum.
- **Distal intestinal obstruction syndrome (DIOS) is common in CF patients, can occur at any age, and is often misdiagnosed as "normal" constipation in CF patients.**
- Occurs in 10-47% of CF patients.
- Is essentially the equivalent of meconium ileus in a non-newborn patient. [6]

Celiac disease

- Celiac disease is a well-recognized and common cause of chronic constipation in children.
- Studies vary, but it appears that children with chronic constipation and especially associated growth failure have a high prevalence of celiac disease.
- Always test *before* putting a child on a gluten-free diet.
  - (Most studies use tTG-IgA as a screening test for celiac. Always add total IgA to avoid false negatives. Consider adding deaminated gliadin antibodies or tTG IgG as a more thorough test).

Other medical causes

- Infantile botulism
- Milk protein intolerance.
  - (Consider other food intolerances.)
- Lead poisoning
- Hypothyroidism
- Anorectal anomalies (particularly anteriorly placed anus.)
- Multiple Endocrine Neoplasia
- Other bowel neurological dysfunction [1, 3, 4]
- More…

Red flags

- Failure to thrive
- Delayed passage of meconium
- Abnormal bowel habit since birth
- Sensitivity to cold, fatigue, dry skin, pallor.
- Fever
- Weight loss
- Absent or brisk lower limb reflexes

Red flags (continued)

- Mouth ulcers
- Blood or mucus mixed with stool
- Sacral dimple or tuft of hair on the spine
- Perianal fistula
- Gluteal cleft deviation
- Perianal skin tags or fistulae
- Associated hypotonia

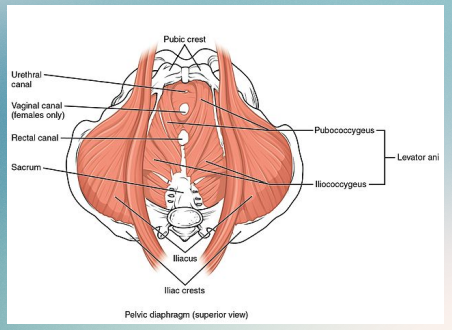
Also associated with constipation:

Associated with constipation (!)

- Encopresis (involuntary soiling)
  - Typically occurs due to “leakage” around a fecal impaction. Can be mistaken for diarrhea. (80% of children with encopresis are constipated!) [8]
- Enuresis (bed-wetting after age 5) and daytime urinary incontinence.
- In my professional opinion, **enuresis (after age 5) is constipation until proven otherwise.** [1, 9]

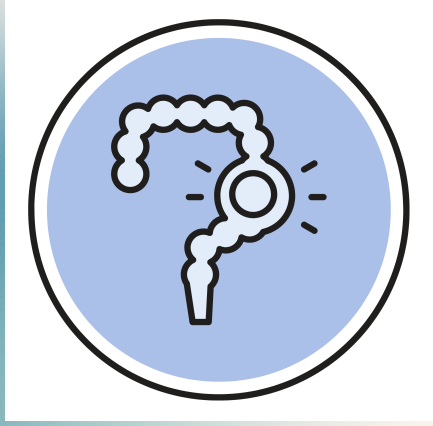
Some bowel movement physiology

Bowel movements require coordination from enteric nervous system, control of anal sphincters and pelvic floor.



Pelvic diaphragm (superior view)

Stool holding significantly interferes with this!



Fecal soiling occurs as liquid stool passes around the bolus in the rectum.

Associated with constipation (!)

- Behavior problems, including ADHD, conduct disorders, socialization problems and more.
- Many parents report a worsening of behavior before stooling.

Associated with constipation (!)

- Obesity
  - Cause and effect? Dietary habits like fast food consumption are associated with obesity and constipation. Lack of physical movement exacerbates constipation.
  - Changes in intestinal flora are related to metabolic syndrome and obesity.
  - Does this worsen constipation?

Physical Exam

Basic PE

- Why? **To rule out organic (non-functional) cause of constipation and identify red flags.**
- Check genitalia, perineum and anus. (Look for irregularly placed anus, imperforate anus or communicating fissure.)
- Digital anorectal examination is NOT typically necessary.
- Perform only when other alarm signs suggest organic disease, or if child has symptoms since early infancy.

Basic PE

- Abdominal exam - typically feel mass in LLQ.
- Make sure to track growth!! (If necessary request growth charts from PCP, if you are not child's PCP)
- Evaluate for spina bifida (look for dimple, increased pigmentation, tuft of hair, nevi in sacrococcygeal area.)
- Basic musculoskeletal and neurological exam to rule out spinal cord or autonomic nervous system dysfunction. (E.g., DTR's, quick evaluation of lower extremity muscular strength.)

Workup

Clinical Diagnosis

- Diagnosis can typically be made clinically. Workup is only necessary to determine secondary cause of constipation.

Imaging (as needed)

- Abdominal x-ray
  - (If diagnosis is uncertain)
  - Barium enema
- Spine radiographs or MRI (if neurological involvement is suspected)
- Anorectal or colonic manometry
- Rectal Biopsy (to rule out Hirschprung's disease)
- Ultrasound

Labs (as needed)

- **Celiac disease.** (Particularly important in children with failure to thrive or recurrent abdominal pain.)
- **Urinalysis** for children with encopresis, because of higher likelihood of urinary tract infections.
- **TSH and free T4.** (Particularly for children with failure to thrive, specifically in vertical growth, or with other signs or symptoms suggestive of thyroid involvement.)

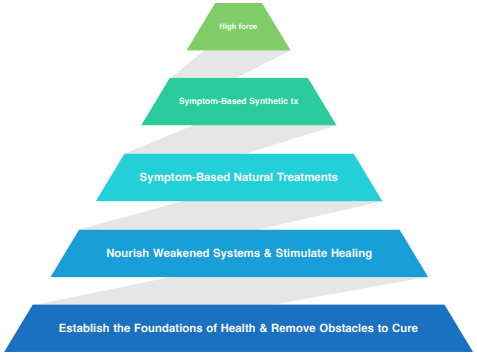
Labs (as needed)

- Electrolytes. (For children who are not able to maintain adequate fluids.)
  - Pay particular attention to calcium.
- **Blood lead.** All children should be screened at least once, but certain children have higher risk: those with pica, developmental disabilities, family history of lead poisoning, living in housing built before 1950, or recently renovated housing.

Consider?

- IgG food sensitivity testing (and all the controversy it entails)

Treatment



Therapeutic Order

Increase Fiber

- Assess in all children!
- Fiber is the best method for *prevention* of constipation, but possibly not the best method for treatment of acute constipation.
- Fiber alone has NOT been definitely shown to improve **moderate or severe constipation.** [1, 12, 13, 14]
- Several different strategies…

Increase Fiber

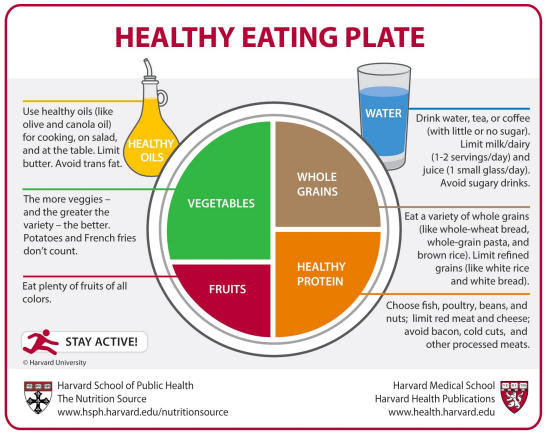
- Positive studies: [15]
  - Acacia
  - Arabinoxylan (whole grain source)
  - Beta-glucan
  - Bran
  - FOS
  - GOS (galactooligosaccharides)
  - Inulin
  - Partially hydrolyzed guar gum
  - Resistant starch
  - Psyllium

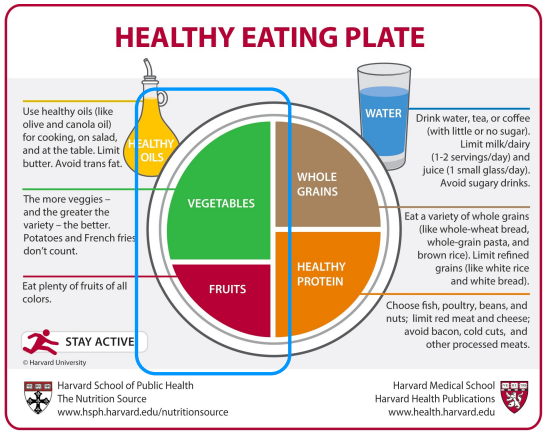
Increase Fiber

- Note that all of the above act as prebiotics. The gut microbiota metabolize these dietary fibers and produce short chain fatty acids.
- Excessive intake of fiber, especially supplemental fiber can cause flatulence, worsening of small intestinal bacterial overgrowth, and abdominal pain.
- Whenever possible I prefer to incorporate fiber as part of a well-rounded diet rather than in supplemental form. In this way children get the benefit of additional vitamins, nutrients and antioxidants.

Strategies for increasing fiber

- The Plate Method
- The List Method





Constipating foods	Non-constipating foods

Examples of constipating foods: all dairy products (cheese, milk, yogurt, ice cream), meats, bananas, starchy grains (like white rice), starchy vegetables (sweet potato, squash), potato products (french fries, potato chips, baked potatoes), most canned fruits and vegetables ("soggy" vegetables that have lost their fiber content), fried foods (donuts, fried chicken, etc), most processed foods (crackers, cookies, snack products, pretzels, etc, unless specifically listed as "high fiber"), white bread or "soft" wheat bread, pasta. Fruit juice (without pulp) is also low in fiber.

Examples of non-constipating foods: most vegetables, especially green leafy vegetables, most fruits (not fruit juice, except prune juice), whole grains (quinoa, brown rice, whole wheat, oats), nuts, seeds, beans (legumes).

Examples of constipating foods: all dairy products (cheese, milk, yogurt, ice cream), meats, bananas, starchy grains (like white rice), starchy vegetables (sweet potato, squash), potato products (french fries, potato chips, baked potatoes), most canned fruits and vegetables ("soggy" vegetables that have lost their fiber content), fried foods (donuts, fried chicken, etc), most processed foods (crackers, cookies, snack products, pretzels, etc, unless specifically listed as "high fiber"), white bread or "soft" wheat bread, pasta. Fruit juice (without pulp) is also low in fiber.

Examples of non-constipating foods: most vegetables, especially green leafy vegetables, most fruits (not fruit juice, except prune juice), whole grains (quinoa, brown rice, whole wheat, oats), nuts, seeds, beans (legumes).

Constipating foods	Non-constipating foods
Peanut butter & jelly on white bread	Oatmeal
Pirate's booty	Carrot sticks
Fruit snacks (processed)	Apple slices
Mac & Cheese	
Hard boiled egg	
Cheese stick	

Examples of constipating foods: all dairy products (cheese, milk, yogurt, ice cream), meats, bananas, starchy grains (like white rice), starchy vegetables (sweet potato, squash), potato products (french fries, potato chips, baked potatoes), most canned fruits and vegetables ("soggy" vegetables that have lost their fiber content), fried foods (donuts, fried chicken, etc), most processed foods (crackers, cookies, snack products, pretzels, etc, unless specifically listed as "high fiber"), white bread or "soft" wheat bread, pasta. Fruit juice (without pulp) is also low in fiber.

Examples of non-constipating foods: most vegetables, especially green leafy vegetables, most fruits (not fruit juice, except prune juice), whole grains (quinoa, brown rice, whole wheat, oats), nuts, seeds, beans (legumes).

Constipation will *worsen* if you do not increase hydration.

- Always increase water intake when increasing fiber intake.
- For kids who struggle to drink water try increasing watery, juicy foods.
- (Milk doesn't count)

Elimination diets

- Dairy has been shown to be associated with a subset of patients with constipation refractory to laxative (or other) therapy.
- Note that for the majority of patients this is NOT an IgE-mediated reaction, and these patients do not appear to have a life-threatening dairy allergy.
- Non-IgE-mediated cow's milk "allergy" (or "sensitivity") has been associated with reflux, vomiting, food refusal or aversions, failure to thrive, colic, abdominal pain, anal fissures, rectal prolapse, diarrhea and constipation. Numerous, numerous studies support the association. [21-27]

Elimination diets

- I recommend a 30 day elimination before challenging the food. **I recommend starting with cow's dairy ONLY before moving on to other elimination diets.**
- Gluten, soy, eggs, bananas, nightshades and corn are frequent problems. **Always follow-up with the challenge phase to confirm!**

Elimination diets

- ***Please be aware of the financial, social, emotional and nutritional impacts of putting children on long-term elimination diets***

Stimulating motility

Stimulate motility

- Normal movement of intestines becomes impaired with chronic constipation.
- In my opinion, this is an incredibly important step in treatment, and is a factor that must be addressed if we are to prevent reoccurrence!

Probiotics

- Probiotics with the best evidence for constipation:
  - *Bifidobacterium lactis* BB-12 and DN-173010 [29]
  - *Lactobacillus casei* Shirota [30]
  - *Bifidobacterium breve* M-16V [31]
  - *Lactobacillus rhamnosus* GG
  - (*Bifidobacterium longum subspp infantis* seems to reduce diarrhea, perhaps slight increased risk of constipation in infants, but research is inconsistent) [29]

Probiotics

- Best overall for infants:
  - *Lactobacillus reuteri* DSM17938 [32]

Probiotics

- Indrio F, et al. Prophylactic use of a probiotic in the prevention of colic, regurgitation, and functional constipation: a randomized clinical trial. JAMA Pediatr. 2014 Mar;168(3):228-33.
- Used Lactobacillus reuteri probiotic for the first 90 days of life **prophylactically**. Reduced mean crying time and increased number of bowel movements per day.

Probiotics

- Summary (and my opinion):
  - Do not use probiotics on children who are severely immunocompromised.
  - Be aware that inulin or forms of FOS may *worsen* intestinal dysbiosis and could potentially exacerbate constipation.
- Otherwise, in my professional opinion, probiotics are quite safe and have some additional research supporting use in colic, prevention of URI. I recommend using mixed strains with FOS, or switching to a FOS-free formula if worsening occurs.

Ginger

- Micklefield GH, et al. Effects of ginger on gastroduodenal motility. Int J Clin Pharmacol Ther. 1999 Jul;37(7):341-6.
  - Study on improving gastrointestinal motility.
- Difficult with compliance, though. Ginger syrups, teas, ginger chews, tincture, etc.

Bitters?

- A little more difficult to get kids to take!
- Gentian/Scutellaria is still a great combo.

Dr. Erika's bitter formula

- Equal parts Mahonia aquifolium, Scutellaria laterifolia, Kalmerite (or Tummy) Glycerite or other glycerine formula with carminative herbs
- Dose: (range) 5 drops - 2 ml in water before meals. (Up to 5 ml t.i.d. is safe for adults, so adjust dose by weight accordingly.) Caution if GERD exists. CI if peptic ulcer, gallbladder disease are present.

Acupuncture

- Qin QG, et al. Acupuncture at heterotopic acupoints enhances jejunal motility in constipated and diarrheic rats. World J Gastroenterol. 2014 Dec 28;20(48):18271-83.
  - (Rat study)
- Wang L, Xu M, Zheng Q, Zhang W, Li Y. The Effectiveness of Acupuncture in Management of Functional Constipation: A Systematic Review and Meta-Analysis. Evid Based Complement Alternat Med. 2020 Jun 17;2020:6137450. doi: 10.1155/2020/6137450. PMID: 32655664; PMCID: PMC7317618.

Acupuncture

- Abbott R, Ayres I, Hui E, Hui K. Effect of perineal self-acupressure on constipation: a randomized controlled trial. J Gen Intern Med. 2015 Apr;30(4):434-9.
- Li MK, Lee TF, Suen KP. Complementary effects of auricular acupressure in relieving constipation symptoms and promoting disease-specific health-related quality of life: A randomized placebo-controlled trial. Complement Ther Med. 2014 Apr;22(2):266-77.
- Anders EF, Findeisen A, Nowak A, et al. Acupuncture for treatment of hospital-induced constipation in children: a retrospective case series study. Acupunct Med. 2012 Dec;30(4):258-60.
- McKenna PH, Herndon CD, Connery S, Ferrer FA. Pelvic floor muscle retraining for pediatric voiding dysfunction using interactive computer games. J Urol. 1999 Sep;162(3 Pt 2):1056-62

Bowel retraining

Bowel Retraining

- This step is imperative for long-term success!
- Children need to "practice" daily bowel movements
- Recommend children to sit on the toilet at the same time each day (preferably first thing in the morning, after breakfast, or after dinner). 5-10 minutes, 2-3 times per day.
- Practice ***every day***, even holidays, weekends, etc!

Bowel Retraining

- Reward children highly!
  - Recommend rewarding for effort, not for success
- Sticker charts, toys, extra screen time while sitting on the toilet, even candy or treats can be helpful if children are highly resistant to toileting.

Bowel Retraining

- I strongly recommend considering pelvic floor physical therapy as a part of bowel retraining. It is imperative to find a PT that is trained in pelvic floor dysfunction AND pediatric therapies. (This is quite rare!) Do NOT send to a PT who lacks experience.
- Biofeedback can be very successful for bowel retraining.

Physical activity

- Physical activity alone can improve constipation. [46]
- Knee-to-chest positions can be helpful.
- Exercises to increase abdominal tone - sit-ups, planks, etc.
- Any squat-like motion.
- Get kids MOVING!

Squatty Potty

Abdominal Massage

- Castor oil abdominal massage.

- Lämås K1, Lindholm L, Stenlund H, Engström B, Jacobsson C. Effects of abdominal massage in management of constipation--a randomized controlled trial. Int J Nurs Stud. 2009 Jun;46(6):759-67.

Laxatives

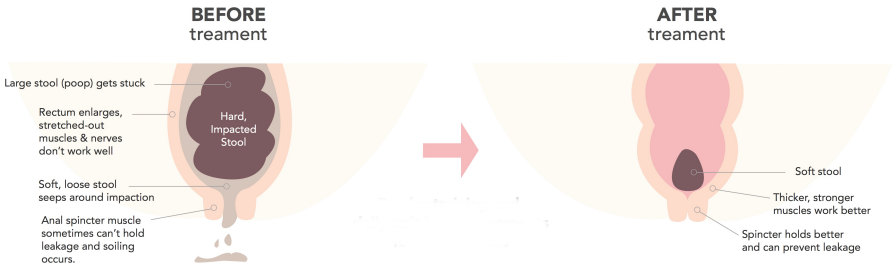
Why laxative therapy?

- 2 phases:
  - "Clean out" phase to remove fecal impaction.
- Maintenance **to prevent reoccurrence**. **Conventional medicine recommends long-term laxative use for at least 4 months.** (Goal = mashed potato consistency)

Why laxative therapy?

- With chronic constipation the diameter of the colon can enlarge, which further exacerbates and predisposes to recurrent constipation. Laxative therapy keeps stools soft, and allows colon to regain normal function.
- Long-term use of laxatives avoids reimpaction.

Chronic Constipation



Miralax

- Consists of polyethylene glycol 3350 (often abbreviated PEG)
- Miralax is recommended for a maximum of 7 days in adults >17 years of age. Its use in children under 17 years of age has not been approved by the FDA. Despite this, Miralax is the mainstay of conventional treatment. (Primarily due to its tolerability, taste and ease of use.)

Miralax

- Polyethylene glycol is NOT the same as ethylene glycol (antifreeze). It consists of a polymer of ethylene oxide molecules. It is non-toxic and non-absorbable.
- So what's the problem?

Miralax

- **FDA reported very low concentrations of ethylene glycol (anti-freeze) and diethylene glycol found in Miralax.** Ethylene glycol is a known neurotoxin to children and can cause metabolic acidosis.
- There have also been reports of adverse neurological and psychiatric events in children.
- This prompted the FDA to conduct a study on the accumulation of low molecular-weight metabolites of PEG in pediatric patients. Study results are pending.

Miralax

- Many studies support use of Miralax over other osmotic laxatives (like lactulose, mineral oil, etc).

Miralax

- Dosing:
  - By Weight: 0.4 to 0.8 g/kg per day in 2 to 8 ounces of noncarbonated beverage (maximum 17 g daily for starting dose)
  - By age:
    - < 18 months: 0.5 to 1 teaspoon, once daily
    - 18 months - 36 months: 2 to 3 teaspoons, once daily
    - > 3 years: 2 to 4 teaspoons, once daily

Sorbitol

- Is a sugar alcohol. Sugar alcohols are not absorbed in the small intestine. It acts as an osmotic laxative in the large intestine.
- Is naturally occurring in prunes, cherries, apples, pears, apricots (and these juices).
- (Note that Elderberry also contains sorbitol, which is why elderberry syrup can be a laxative in high doses.)

Sorbitol

- CAUTION with kids with dysbiotic flora.
- Sorbitol can be fermented by colonic bacteria.
- Not to be used by patients with fructose intolerance. (Sorbitol can be metabolized to fructose.)

Sorbitol

- Dosing: Sorbitol 70% solution.
  - Children age 1-11: 1 ml/kg, 1-2 times per day. (Max dose 30 ml/ day)
  - Children age 12-adult: 15-30 ml once to twice daily.
- Stools in 24-48 hours.
- (Or: Prune juice!!)

Lactulose

- Similar to sorbitol, is non-absorbable and draws water into lumen of large intestine via osmotic effect.
- Also treats hepatic encephalopathy.
- Used diagnostically in hydrogen/ methane breath testing for Small Intestinal Bacterial Overgrowth (SIBO)

Lactulose

- Again, caution in patients with dysbiotic flora.
- Side effects of flatulence, abdominal cramping, occasionally nausea.

Lactulose

- Dosing: Lactulose 70% solution.
  - Children age 1-11: 1 ml/kg, 1-2 times per day. (Max dose 30 ml/day)
  - Children age 12-adult: 15-30 ml once to twice daily.
- Stools in 24-48 hours.

Mineral oil

- Acts as a lubricant laxative. Emulsifies stools and coats the rectum, aiding passage of stool.
- Taste is a significant factor. Some sources recommend mixing with ice cream, sherbet, orange juice, chocolate pudding, etc.
- **Not for use** in infants, GERD, children who are neurologically impaired. Risk of aspiration pneumonia!

Mineral oil

- Dosing:
  - Children age 1-11: 1-3 ml/kg, once daily (maximum 45 ml daily)
  - Children age 12-adult: 15-45 ml once daily.
- Stools in 6-8 hours. Oil seepage is common.

Magnesium hydroxide

- A.K.A. Phillips or Milk of Magnesia
- Mg hydroxide also acts as an antacid and neutralizes stomach acid. (This may have a beneficial or detrimental effect.)
- Taste - not so great. Tip: mix in a smoothie with fruit, almond milk or ice cream.
- Acts as an osmotic laxative.

Magnesium hydroxide

- Dosing:
  - Children age 1-11: 1-3 ml/kg of 400 mg/5ml solution daily. Max dose 60 ml daily (in divided doses or individually).
  - Children age 12-adult: 30-45 ml daily of 400 mg/5ml solution, or 15-30 ml daily of 800mg/5 ml solution.
  - Stools in 30 min - 6 hours.

Magnesium hydroxide

- Contraindicated in renal failure.

Magnesium citrate

- Lots of different brands that are easily available at a pharmacy or health food stores.

Magnesium citrate

- Dose:
  - Children <6 y/o: 2-4 ml/kg daily of 1.745 g/30 ml
  - Children 6-12 y/o: 100-150 ml daily of 1.745 g/30 ml solution.

Magnesium citrate

- Dose (other options for dosing, my preferred method):
  - Start with 100-250 mg daily, increase dose by 100-250 mg per day until stools are very loose.
- (Older children, >6 y/o: start with 500 mg, increase dose by 250 mg daily)
- (E.g., 1 teaspoon Mg powder twice per day, increase by 1/8-1 teaspoon per day.)

Magnesium citrate

- Conventional medicine recommends for short-term use only, but there is no indication why.
- Dosage fluctuations are common, which makes it tricky to maintain a steady dose and laxative effect. ("Bowel tolerance" changes as need for magnesium changes.)
- Warn parents that after a few weeks they may need to lower the dosage.

Vitamin C?

- Vitamin C in high doses can have a laxative effect. (Mechanism of action is unknown to me!)
- Dose (there are no clear guidelines for dosing vitamin C for constipation)
- (Sample dosage) Ascorbate, ascorbic acid or buffered vitamin C powder - 500 mg - 2+ grams per day. Recommend buffered form at dose >1 g/day, otherwise GI side effects will occur.

Senna

- Is a stimulant laxative, works by irritating intestinal cells to produce contractions.
- Product exists in tea, tablet or syrup form. (E.g., Ex-Lax tablets or senna syrup.)
- **Not to be used for longer than 7 days** due to risk of forming pseudomelanosis coli. (Deposition of lipofuscin pigment in the lamina propria of the large intestine.)

Senna

- Stimulant laxatives tend to have a higher likelihood of dependence.
- Dose:
  - 1-2 y/o 1.25-2.5 mL one to two times daily.
  - 2-6 y/o 2.5 - 3.75 mL one to two times daily
  - 6-12 y/o: 5-7.5 mL or 1-2 tabs, 1-2x daily.
  - 12-adult: 5-15 mL or 1-3 tabs, 1-2x daily.

Review of laxatives

- Miralax is by far the easiest taste-wise, which is why it is standard of care in conventional medicine.
- I prefer to start with a combination of Mg citrate and vitamin C - 100-250 mg of each, increasing by 100-250 mg per day. **Be flexible**! Some kids will tolerate certain medications, others won't.

Bowel cleanout

Bowel cleanout a.k.a. fecal disimpaction

- Will be necessary if there is stool soiling, a palpable abdominal mass, significant stool seen on abdominal x-ray, or history of incomplete emptying.
- Consider for children with long-term, chronic constipation.

Seattle Children's Hospital Constipation recommendations

- Recommend a 3 day bowel cleanout with Polyethylene glycol (PEG, a.k.a. Miralax) **AND** a stimulant medication.
- Cleanout phase is followed by long-term laxative therapy (PEG) once daily at listed dose. Titrate dose to consistency of mashed potatoes. Length of treatment: 4-12 months.

Seattle Children's Hospital Constipation recommendations

A. **Polyethylene Glycol:** Give the following dose **2** times a day for **3** days**:**

Child's weight (approximate age)	Child's MiraLAX® dose	Maximum Titration amount (+/-)	Daily liquid intake (prefer clear)
10 to 14.9 kgs. (2 yr old)	❑ ½ capful	❑ ¼ cap	❑ 1000 ml
15 to 19.9 kgs. (3-4 yr old)	❑ ¾ capful	❑ ¼ cap	❑ 1250 ml
20 to 24.9 kgs. (5-6 yr old)	❑ 1 capful	❑ ½ cap	❑ 1500 ml
25 to 29.9 kgs.(7-8 yr old)	❑ 1 ¼ capful	❑ ½ cap	❑ 1600 ml
30 to 39.9 kgs. (9-11 yr old)	❑ 1 ½ capful	❑ ¾ cap	❑ 1750 ml
40 to 49.9 kgs. (12-14 yr old)	❑ 1 ¾ capfuls	❑ ¾ cap	❑ 2000 ml
50 to 69.9 kgs. (14-16 yr old)	❑ 2 capfuls	❑ 1cap	❑ 2250 ml
70 kgs. and over (16 and older)	❑ 2 ½ capfuls	❑ 1 cap	❑ 2500 ml

B. **Stimulant:** Based on patient age and preference, also give one dose of one of the following medications each evening in addition to MiraLAX® for the 3 day cleanout: WARNING: Any oral medication could contain sugar and is therefore contraindicated for any child on the ketogenic diet. Please consult a pharmacist.

Age 12 to 18 months:

❑ Senna 4.4 mg. By prescription: 1/2 teaspoons (2.5 ml) or OTC: Little Tummy's Laxative Drops® (0.5 ml)

Age 18 months to 5 years:

❑ Senna 13.2 mg. By prescription: 1 ½ teaspoons (7.5 ml) or OTC: Little Tummy's Laxative Drops® (1.5ml) or ¾ regular strength Ex-Lax® chocolate chew

5-10 years prefers liquid:

❑ Senna 17.6 mg. By prescription: 2 teaspoons (10 ml) or OTC: Little Tummy's Laxative Drops® (2ml) or 1 regular strength Ex-Lax® chocolate chew

5-10 years, prefers pill:

❑ Bisacodyl (Dulcolax®) 10 mg. By prescription or OTC: 2 tablets (5mg each)

Over 10 years, prefers liquid:

❑ Senna 26.4 mg. By prescription: 3 teaspoons (15 ml) or OTC: Little Tummy's Laxative Drops® (3ml) or 1 ½ regular strength Ex-Lax® chocolate chews

Over 10 years, prefers pill:

❑ Bisacodyl (Dulcolax®) 15 mg. By prescription or OTC: 3 tablets (5mg each)

Naturopathic bowel cleanout

- Start with magnesium citrate (with or without vitamin C). Starting dose: 250 mg daily, increase by 125 - 250 mg until patient reaches mashed potato-consistency stools. This is their baseline dose for daily maintenance.
- Add: an additional 125 - 250 mg of magnesium citrate PLUS stimulating laxative like senna
- OR do a saline enema for the bowel cleanout.

After the naturopathic cleanout

- Continue a daily dose of magnesium citrate (+ or - vitamin C) for *at least 3 months*. I strongly recommend 6+ months if constipation is chronic. This will allow time for the rectum to return to normal size.
- Continue all other naturopathic therapies, including dietary interventions, physical movement, pelvic floor PT (if necessary), prokinetics.

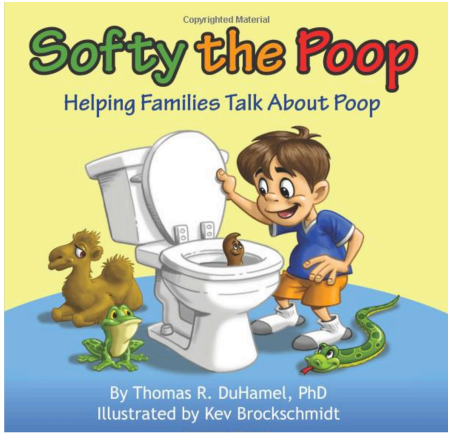
Be AWARE!

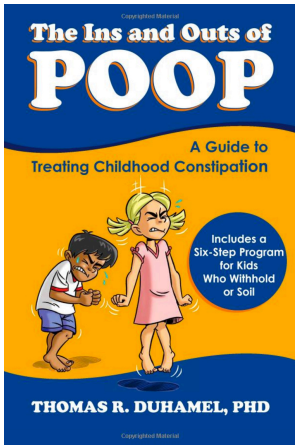
- Bowel clean outs are not pleasant. For children who already have some fear around stooling it can trigger some pretty intense emotional reactions. Parents should be close by, and encourage the child that they are safe, that it is a normal reaction, that they will feel much better soon, etc, etc.
- I recommend frequent follow-up visits for monitoring progress.

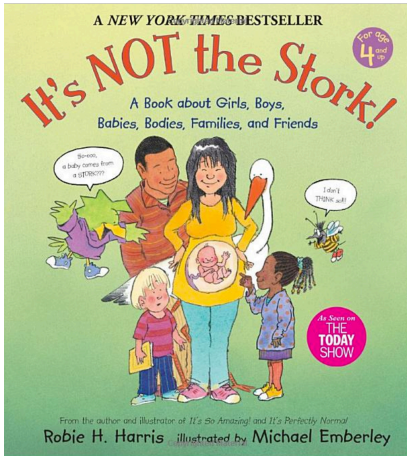
Education

- Teach patients the anatomy of the rectum and anus - remind them that for the bowels to become normal again that fecal impaction must be completely gone, and stools will need to be mushy-to-runny for ***months*** to rehabilitate the rectum.

Chronic Constipation







Infants

- Infants should **not** be given mineral oil due to risk of aspiration.
- Infants respond **very** well to probiotics.
- Infants respond well to sorbitol or lactulose syrups or simple fruit juices (e.g., prune juice, which is my preference). Consider dairy-free diet if Mom is breastfeeding. Consider adding sorbitol-containing fruit purees - e.g., prune puree daily to help with constipation.

Saline Enemas

- Consider a saline enema if the child is in significant pain.
- Glycerine suppositories can also be given to infants or children. Be aware that infants can become habituated to suppositories, and sometimes only defecate with rectal stimulation.

Instructions for administering an enema

- Have the child lie on their stomach with knees pulled under them, or in a hands and knees (crawling) position. Place plenty of towels underneath the child in case of leakage.
- Remove the protective cap and lubricate the tip of the enema with KY jelly or another lubricant.

Instructions for administering an enema

- Gently slide the tip past the anal sphincter, pointing the nozzle in the direction of the child's belly button. Push gently and follow the path of least resistance. Push the tip or nozzle 1-2 inches into the rectum. **STOP if the child is in distress.**
- Squeeze a few tablespoons of solution into the rectum, or follow directions from your physician.

Instructions for administering an enema

- Squeeze the enema tube very gently to give a small, slow stream of solution into the rectum.
- Remove the enema tip and place the child on the toilet. If they are unable to have a bowel movement within 15 minutes then try again with another enema, using slightly more solution.
- Again, STOP if the enema is causing pain at any point!

Other naturopathic strategies

Evaluation of dysbiosis

- Consider microbiology, parasitology or comprehensive digestive stool analysis
- Pay particular attention to relationship between healthy bacteria (Lactobacillus + Bifidobacteria) and potentially pathogenic flora. (E.g., *Proteus, Klebsiella, Candida, Bacillus,* or other yeast species.)

Treatment of dysbiosis

- "Weed and feed"
  - GAPS, Specific Carbohydrate, low FODMAP or similar diet. (I like Alison Siebecker's combined low FODMAP/SCD diet, simply for ease of use.)
  - Combination herbal antimicrobials x 30 days.

Treatment of dysbiosis

- Combination herbal antimicrobials x 30 days. Consider Rifaximin (expensive)
- Retest, then add high dose probiotics (FOS free or regular) - at least 25 billion per day. Some clinicians believe higher dose (200+ billion/day) is better.

SIBO?

- Methane-predominant SIBO is frequently linked to chronic constipation in adults.
- In my opinion the vast majority of children simply need their fecal impaction/chronic constipation to resolve and their SIBO will go away or improve. For this reason I avoid testing SIBO in children younger than 12.

Correct structural integrity

- Manipulation to achieve normal bowel function?
- Spinal manipulation? Visceral manipulation?
- Gürsen C, Kerem Günel M, Kaya S, et al. Effect of Connective Tissue Manipulation on Symptoms and Quality of Life in Patients With Chronic Constipation: A Randomized Controlled Trial

Food allergy or sensitivity

- Not a lot of research supporting. Again, milk protein intolerance/sensitivity (with elevated IgG antibodies) is the only food supported by research.
- Clinically, I do see some very good improvement, but certainly not for all patients.
- The goal should not be dietary restriction for the long-term, particularly in growing children.

Cases

Case #1

- 8 y/o with chronic constipation. Previously evaluated by MD Pediatrician and Gastroenterologist, was recommended continually increasing doses of Miralax.
- No red flags present.

Case #1

- Things tried:
  - Magnesium
  - Vitamin C
  - Enemas
  - Abdominal massage
  - Chiropractic
  - Dairy elimination, gluten elimination
  - Probiotics
  - Motility combination herbal

Case #1

- Things tried (continued)
  - Castor oil abdominal packs
  - Seattle Children's Bowel Cleanout
  - Smooth Move Tea
  - Coffee (self-prescribed, helped for a short time)

Case #1

- Ran bloodwork - screening for lead, hypothyroidism, autoimmune disease (pt also had complaints of joint pain).
- Suspicion of dysbiotic flora because Mom had intestinal problems, two siblings with reflux, brother with Aspergers (may or may not be related), all kids had significant dental caries.

Case #1

- Ran stool testing which showed normal digestive function but elevated levels of Proteus spp. (4+)
- 1 month combination antimicrobials and low FODMAPs diet (with continued probiotic) normalized stools. Recurrence shortly after this.

Case #1

- One more round of herbals (x6 weeks) again normalized stools.
- Mom notices a significant difference with high FODMAP foods.

ADDRESS EMOTIONAL FACTORS!

Case #1

- One more round of herbals (x6 weeks) again normalized stools.
- Mom notices a significant difference with high FODMAP foods.

Case #2

- 11 y/o Adopted from China age 18 months
- Possible hx of sexual abuse in the orphanage.
- Never had a bowel movement in the toilet. BM in size 5T pull-ups. She crouches in her room and hides, shaking before a BM.

Case #2

- Has had multiple rounds of imaging completed, has done the equivalent of Seattle Children's Bowel Cleanout regimen. No one has really addressed the emotional factor.

Case #2

- Physical exam - barely completed due to her intense fear and reluctance to be touched. Hid behind the chair with her Mother and Aunt. Did not speak, but was clearly engaged and was listening to the whole conversation. Only accomplished vitals.

Case #2

- Recommended:
  - FOS (Inulin)-free probiotic, 25 billion organisms per day to help stimulate motility.
- Magnesium citrate, starting at 250 mg per day, increasing by 250 mg per day until stools are soft. Serves two-fold purpose of softening stool and providing relaxation.

Case #2

- Recommended:
  - Teaching her about normal body functions:
- It's Not The Stork - book by Robie Harris and Michael Emberly. Focusing on normal anatomy and what parts of the body are for. Reinforcing how poop happens, that it is a normal body process, that it feels good.

Case #2

- Follow-up:
  - Still stooling in her pullup.
  - Probiotics are helped increase frequency.
- Mom stated she is more proactive about her health, is willingly eating fiber, is asking to take the probiotic daily.
- Did not do magnesium therapy, instead continued Miralax as recommended by her GI doc.

Case #2

- Found a Physical Therapist near them, made referral. (Family resides most of the year in AZ, we found Desert Physical Therapy who specializes in pediatric enuresis and encopresis)
- Reinforced the importance of teaching her normal anatomy and what normal stooling is.

(Constipation due to hypotonia)

Case #3

- 2 yr male with Rubinstein Taybi syndrome (RTS)
- Issue: constipation is a direct result of his genetic condition. Need to improve abdominal tone to allow for a BM.
- Do NOT give magnesium (or use caution with magnesium) with children with hypotonia (Down's Syndrome, etc), as it may worsen hypotonia.
- Baby sit-ups can be very helpful.

Case #3

- Recommended: powdered infant probiotics (25 billion organisms, mix of Lactobacillus and Bifido species), vitamin C (250 - 500 mg daily, additional if necessary), castor oil abdominal massage.
- Discussed "moving the traffic jam" with abdominal massage.
- Physical therapy to increase abdominal tone.

Case #3

- Improved to near-normal bowel movements.

Q&A

Thank you!