Constipation in Children with Medical Complexity

INTRODUCTION:

- **Why is the risk of constipation high in CMC?**
  1. Alterations in physiology, such as neuromuscular weakness or GI dysmotility
  2. Side effects from chronic medications
  3. Increased likelihood of sedentary behaviour

- **Causes of DEALY in Dx and Tx of constipation in CMC?**
  - Communication difficulties
  - May present as loose stools, which represent overflow
  - May be seen as lower priority than other aspects of medical management

- **What is it IMPORTANT to manage constipation in CMC?**
  - Improves quality of life for the child and their family
  - Improves other health aspects (e.g., sleep, behaviour, appetite, vomiting)

PREVALENCE:

In children with CP: 26-74%, based on the definition used in the study

- Risk of constipation increases as the level of complexity increases

DEFINITION (similar to the definition of functional constipation):

TABLES 1 & 2

ROME IV DIAGNOSTIC CRITERIA

CHILDREN AGED 4Y AND YOUNGER

A child is defined as having functional constipation if he/she has 2 or more of the following for at least 1 mo (in the absence of an organic pathology):

- ≤2 defecations per wk
- History of excessive stool retention
- History of painful or hard bowel movements
- Presence of a large fecal mass in the rectum
- History of large-diameter stools

In children who are toilet trained, the additional criteria may be used:

- At least 1 episode per wk of incontinence after the acquisition of toileting skills
- History of large-diameter stools (may block the toilet)

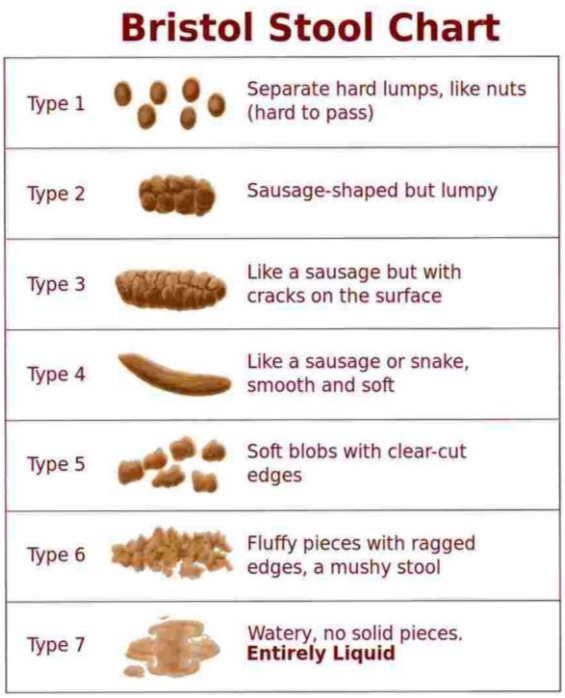
Adapted from Benninga MA, et al.[7]

CHILDREN AGED 4Y AND OLDER

A child is defined as having functional constipation if he/she has 2 or more of the following for at least 2 mo (and not meet the criteria for irritable bowel syndrome):

- ≤2 defecations in the toilet per wk
- At least 1 episode of fecal incontinence per wk
- History of retentive posturing or excessive volitional stool retention
- History of painful or hard bowel movements
- Presence of a large fecal mass in the rectum
- History of large-diameter stools (may block the toilet)

Adapted from Hyams JS, et al.[8]



OTHER CLINICAL FEATURES:

- Withholding behaviours
- Daily stools of small volume
- Urgency
- Lack of normal sensation for BM
- Abdominal pain/irritability
- Bloating
- Vomiting
- Decreased appetite

ORGANIC CAUSES:

FUNCTIONAL CONSTIPATION is the most common cause of constipation in healthy children.

Organic causes:

1. Dietary causes: Decreased fluids, decreased dietary fibers, malnutrition, consumption of constipating diet
2. GI conditions: Celiac disease, CMPA
3. GI obstruction: HD, CF, CD
4. Anal: Imperforated anus, anal stenosis, anterior anus, painful anal conditions (e.g., abscess)
5. CNS: Tethered cord, chronic intestinal pseudo-obstruction
6. Metabolic: Hypothyroidism, hypercalcemia, hyponatremia, hypokalemia, hyperparathyroidism
7. Medications (see below)

Constipating medications: Dimenhydrinate, diphenhydramine, PPI/H2RA, ondansetron, opioids, Ca supplements, iron supplements, vincristine

RISKS:

Constipation increases the risk of:

- UTI
- Urinary retention (both the anal and urethral sphincters are innervated by the same nerve)
- OAB
- Anal fissure

TRIGGERS:

Constipation may start/worsen with voluntary withholding behaviour, such as with:

- Toilet-training at a young age
- Pressure to avoid fecal incontinence
- Causing stress when the child has fecal incontinence
- Past experiences (e.g., sexual abuse, painful defecation)

HISTORY:

Ask about:

1. Clinical features listed above
2. Clinical features of organic causes, most importantly:
   - Poor dietary habits (e.g., tendency towards constipating diet)
   - Celiac disease: Weight loss, Fe deficiency
   - HD: Time of passing meconium
   - CNS disease: Neurodevelopmental clinical features (e.g., developmental delay)
   - Hypothyroidism: Cold intolerance, weight gain
   - Medications listed below
3. Risks listed below
4. Triggers listed above

In your history, do NOT forget to ask about behaviours around toileting (e.g., toilet-training, reminders to go to toilet, stress round toileting, position during toileting, use of diapers/pull-ups)**.**

EXAMINATION:

- Abdominal examination (look for a fecal mass), including **DRE** (some experts advice against it)
- Neurological examination, including back examination and for dysmorphic features
- Thyroid examination

INVESTIGATIONS:

- Rarely needed to R/O organic causes (e.g., thyroid profile, Ca, anti-tTG-IgA)
- Anorectal manometry (in case the diagnosis of functional constipation is still in doubt)

TREATMENT:

Disimpaction followed by maintenance laxatives:

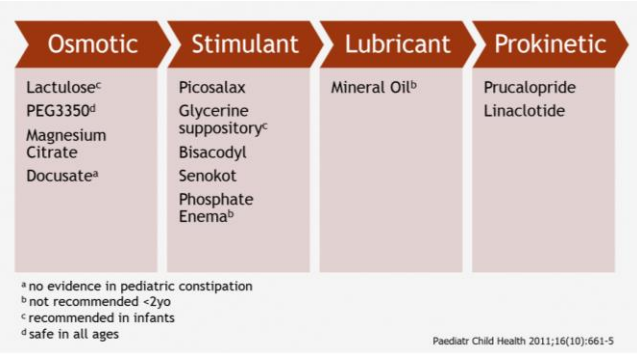
Laxative summary:

Stimulant laxatives:

- Cause contractions to mobilize stool
- Helpful adjuvant in CMC due to their slow GI motility (softening stools with osmatic laxatives may not be enough)

Osmatic laxatives:

- Soften stools by adding water



Disimpaction:

PO/GT:

Medication	Dose	Others
High-dose PEG	1.5 g/Kg/day	Mix with 125-250 water or juice (min 30 ml)
PEG + electrolyte solution (e.g., Peglyte, Golytely)	25 ml/Kg/hr up to 400 ml/hr via NGT/GT (can be used in JT in slower rate)	
Pico-salax	1-6 years: Administer ¼ sachet 6-12 years: Administer ½ sachet Over 12 years: Administer 1 sachet	- Both simulant + osmatic - Mix 1 sachet with 160 ml water - Can be given BID for a short period of time for refractory constipation
Bisacodyl (Dulcolax)	3-12 years: 5 mg PO >12 years: 5-10 mg PO	Tab can't be crushed; takes 6-12 hr for effect, can't take with antiacids/dairy products

PR:

Medication	Dose	Others
Bisacodyl (Dulcolax) suppository	6 months – 2 years: 5 mg 2 years – 11 years: 5-10 mg 12 years and older: 10 mg	15-60 min for effect
Glycerine suppository	<1 year: glycerin "tip" (tip of adult Glycerin sup) 1-5 years: ½ adult glycerin sup >5 years: Adult glycerin sup	
Enemas (Phosphate (or fleet), bisacodyl (or Dulcolax), barium, gastrografin, soap suds, NS, mineral oil	**NS:** 5-10 ml/kg → acts mechanically to flush/irrigate the bowel (can be administered high in the colon) **Mineral oil:** 15-30 ml/year of age, max 240 ml → softens stools (can leave O/N followed by NS/bisacodyl enema in AM) **Bisacodyl (Dulcolax):** For children ≥2 Y/O; 5-10 mg; can be administered high in the colon – helps disimpact proximal bowel as well if administrated high **Phosphate (fleet):** Age < 12 years → pediatric enema; age 12 years and older → adult enema; can cause electrolyte disturbance	

Other insights:

- For disimpaction, **PO/GT** laxatives are **preferred** to PR:
  - PR laxatives can promote (1) anxiety for child/parents, (2) cause discomfort or (3) may be mechanically difficult to complete
  - PR laxatives are preferred with:
    1. **Decompression of abdominal distension** to tolerate PO/GT laxatives
    2. **Rectal fecal loading**
- **Red Robin Catheter** or Foley's catheter can be used to administer enemas:
  - Can be inserted all the way until the end (or until resistance is felt)
  - Lead to proximal administration of enema → better outcome
  - Can be left in place after administration to facilitate passage of stool/gas
  - Need to be flushed after enema administration
  - Can be used sometimes without enema (e.g., O/N)

Maintenance (often long-term treatment to avoid relapse – al least 6 months (can be for years), NO dependence exists, wean should be gradual):

Osmotic:

Medication	Dose	Others
PEG	0.5-1.5 g/Kg/day (max 68 g/day)	Mix with 125-250 water or juice (min 30 ml) Onset 2-4 days (if no effect in 48 hr, titrate up) Odorless/tasteless
Lactulose	0.5-3 years: 2.5-5 ml q8-24h > 3 years: 15-30 ml q8-24h	- Can double the daily dose until stool is produced; then titrate to effect - For administration via tubes, flush with 5-10 ml water after each dose
Fruitlax	Refer to Fruitlax document	

Stimulant:

Medication	Dose	Others
Bisacodyl (Dulcolax)	3-12 years: 5 mg PO daily >12 years: 5-10 mg PO daily	Tab can't be crushed; takes 6-12 hr for effect, can't take with antiacids/dairy products
Senna (Senakot)	< 2 years: 2.5 mL q24h 2-5 years: 2.5 or 5 mL q24h 6-12 years: 5 or 10 mL q24h > 12 years: 10 mL q24hr or 1-2 tablet(s)	- Tab + liquid + chocolate forms - Some patients, particularly those receiving opiates, may require higher doses and/or more frequent administration

Other insights:

Osmatic laxatives:

- **PEG IS THE FIRST LINE**
- PEG causes flatulence; lactulose causes flatulence and **abdo cramping**

Stimulant laxatives:

- Often adjuvant therapy to osmatic laxatives
- Bisacodyl is more effective than senna, but:
  - Senna is available in liquid form and chocolate
  - Bisacodyl's tablet has enteric coating – can't be crushed
- Can cause abdominal pain/cramps + vomiting
- Better to be given in the AM
- Contraindicated with bowel obstruction, such as fecaloma (can cause bowel perforation)
- Can be used for years
- Be aware of their **side effects**:

Agent	Precautions
Senna: comes in liquid, chocolate and tablet form	Idiosyncratic hepatitis, melanosis coli, hypertrophic osteoarthropathy, analgesic nephropathy
Bisacodyl: tablets most commonly available (cannot crush)	Abdominal cramps, diarrhea, hypokalemia, abnormal rectal mucosa, proctitis (rare), urolithiasis (case reports)

Education:

Clarify laxative management: Importance of treatment, need for long-term treatment, no dependence exists, common side effects, importance of follow-up, weaning process

Dietary strategies:

1. Increase fluids
2. Increase fruits
3. Decrease constipating diet
4. Increase fiber

Increase physical activity

Behaviours:

1. Toilet sitting after meals (for 10-15 min)
2. Stool under feet
3. AVOID causing stress around toileting
4. Give child PRIVACY during toileting
5. Avoid DISTRACTION during toileting
6. Warm bath QHS
7. Teach the child to pay attention to his/her needs to pass a BM

Provide parents handouts about:

1. Constipation and its management plan (individualized to patient).
2. Withholding behaviours.
3. Constipating diet to decease.
4. High-fiber diet.
5. Others (e.g., **Fruitlax** document, Cecostomy tube).

If the patient is on constipating medications, R/A the need to continue such medications.

Regular follow-up is IMPORTANT.

- **Indications for GI referral:** Refractory or organic constipation
- **GOAL:** 1-3 BM/day, Bristol score 3-5

ADVANCED DIAGNOSTICS/MANAGEMENT IN REFRACTORY CASES:

Diagnostics:

- Neuromuscular transit studies
- Anorectal manometry
- Colonic manometry

Advances therapeutics:

- **Medications:**
  - Prucalopride
  - Linaclotide
- Anal Botox injection
- Routine rectal irrigations/transanal irrigation systems
- Antegrade enema:
  - Cecostomy
  - Appendicostomy (Malone Antegrade Continence Enema – MACE)
- Diverting ileostomy/colectomy