

# ~~Voiding Dysfunction in~~ Children

N. Dharamsi

December 2021

# Lower Urinary Tract Dysfunction

N. Dharamsi

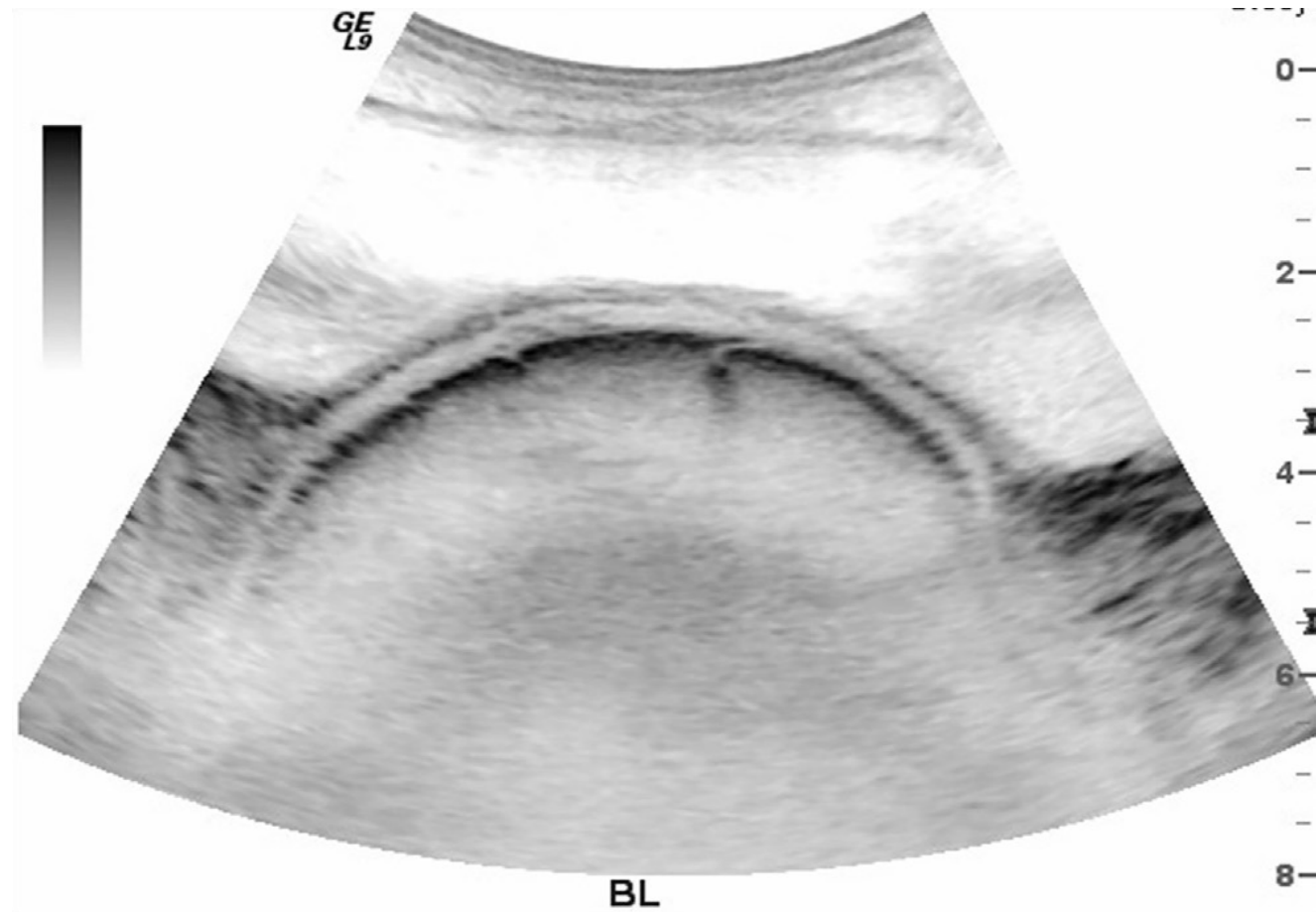
December 2021

## Case (Nov 3, 2021)

- 7 year old female with day and night time incontinence and urinary tract infections (maybe febrile in the past, but now afebrile)
  - No constipation
  - No relevant family history
  - Otherwise health

- Family history /physical exam
  - Unremarkable
- Investigations
  - Required?

# Renal/bladder ultrasound



# Voiding cystourethrogram



# Voiding and Stool Calendars

For two consecutive 24 hour periods, (preferably a weekend), please measure each time your child voids (pees) and record the amount (in ml., cc., or oz.) on this sheet, along with the time of day he/she voided. Please make appropriate comments in the "comment" column, i.e. Did your child wet in between voids? Did he/she have to go urgently? Did he/she have a bowel movement with the void making it difficult or impossible to measure?

Please bring this sheet with you to your next clinic visit.

DAY/DATE	TIME	URINE VOLUME	COMMENTS
Sat Oct 30/21	12:08	1/4 cup	Just Normal
Sat Oct 30/21	3:34	2/3 cup	had to go really badly
Sat Oct 30/21	5:25	1/5 cup	
Sat Oct 30/21	10:15 PM	1/3 cup	
Sat-Sun Oct 31/21	Overnight	Wet pullup (full)	
Sun Oct 31/21	11:05 AM	2/3 cup	
Sun Oct 31/21	9:48	1/2 cup	couldn't hold it
Sun-Mon Nov 1/21	Overnight	Wet pullup (full)	

STOOL CALENDAR

Please chart for ONE WEEK using the guidelines of the attached Bristol Stool Chart and indicate below the date, time, bowel movement (large, medium, small) and if there was any pain associated with the bowel movements.

	DATE	TIME	STOOL TYPE	COMMENTS
Day 1	Oct 26 2021			no poop
Day 2	Oct 27 2021			no poop
Day 3	Oct 28 2021	5:55 AM	Sausage	Medium Size
Day 4	Oct 29 2021			no poop
Day 5	Oct 30 2021			no poop
Day 6	Oct 31/21	11:10 AM	Sausage	medium size
Day 7	Nov 1/21			no poop



# Lower Urinary Tract Dysfunction

- What is it?
- Who do we see it in?
- What to do about it?
- How to do it (fix it)?
- Why fix it? What happens if left untreated?

# Also called

- Bladder/bowel dysfunction (BBD) previously dysfunctional elimination
  - voiding dysfunction
- 
- Can be seen with urinary incontinence or retention
  - Also related to urinary tract infections and bedwetting

# Why fix it...it will get better with time...won't it?

- 5-20% children suffer with daytime incontinence
  - Voiding disorders 2-5x more common in girls
  - Associated with body mass index
    - BMI > 85<sup>th</sup> percentile more likely to experience treatment failure
- Collis et al., 2019 (Child Care Health Dev)
  - Reduced QoL for child and parents QoL and socioemotional functioning negatively affected
  - 1185 children surveyed
    - Severity of “wetting pants in class” was rated the third most stressful

# Comorbidities

- Relationship between LUTD/BBD/VD and UTI's
  - UTI effect of VD but also can precipitate VD
- Association between VD and Vesicoureteric Reflux (VR)
  - Particularly in older children who present with febrile UTI's
  - Children with spontaneous resolution of their reflux, the prevalence of VD was much lower
  - Unsuccessful surgical outcomes involving persistent, recurrent and contralateral reflux occurred only in children with BBD

# Comorbidities

- Psychological Associations
  - 20-40% of children with daytime urinary incontinence are affected by comorbid behavioral disorders
    - 2-4x higher rates of psychosocial problems than compared to other chronic illness group
- Joinson et al., 2006
  - 8000 children between 7.5-9 years
    - In the daytime wetting children
      - 24.8% ADD/ADHD
      - 11.8% conduct disorders
      - 11.4% separation anxiety
      - 10.9% oppositional behaviour

# Bowel Dysfunction

- 2004
  - $\frac{1}{4}$  functional fecal retention reporting daytime incontinence
- 2013
  - $\frac{1}{2}$  of patients seen in Pediatric Urology Clinic for LUTS functional constipation
- Pathophysiology
  - Pressure on bladder
  - Common neural input to sphincter

# How to fix it?

- CUAJ, Feb 2021
  - Urotherapy/bladder retraining with timer to assist scheduled voiding is recommended over the same treatment without time (Grade level:moderate)
    - What is urotherapy?

# Urotherapy

- “Simple”
- “lack of adverse effects”
- All regimens include
  - Timed voiding
  - Fluid intake/diet strategies
  - Constipation management
- Many different protocols in the literature
  - Many different Youtube videos
  - Multidisciplinary approach has improved success



# Urotherapy

- ESPU, Sept 2021



## Key elements of urotherapy

- Explanation/education
- Instructions
- Biofeedback
- Behavioral modification
- Bowel management

### Focus on

- Function and dysfunction
- Bladder/bowel diaries
- Micturition frequency
- Bowel movement
- Wet incidents
- Optimal voiding position
  - Improve flowrate
- Pelvic floor rehabilitation

# How should it be done?

- Face-to-face (group or individual) bladder re-training and video instructions are equally effective (GRADE level: Low to moderate) (CUAJ, Feb 2021)
- However, addition of biofeedback to standard urotherapy is beneficial (Grade level:high) particularly for underactive bladder but not with other types of BBD.
  - Pelvic floor physiotherapy does facilitate resolution of daytime incontinence in children with BBD (Grade level: moderate)

# Behavioral Management (UI)

- Timed voiding with frequent voids q2hr
  - Ideally prior to sense of urgency, attempting to empty completely without staining
- Timed voiding
  - Positive reinforcement
    - Rewards shown to improve child's self-esteem and compliance
    - Ideally, reward for following the program and not for dry episodes
- ADHD/Psychiatric Issues/Developmental issues

# Biofeedback

- Patients taught to control some of their body functions
- Connected to electrical sensors that help you receive information about your body
- Biofeedback then given you the ability to practice new ways to control your body

# Biofeedback

## RCT-Biofeedback Therapy

Rao et al Lancet Gastro 2018

### Office Biofeedback



### Home Biofeedback

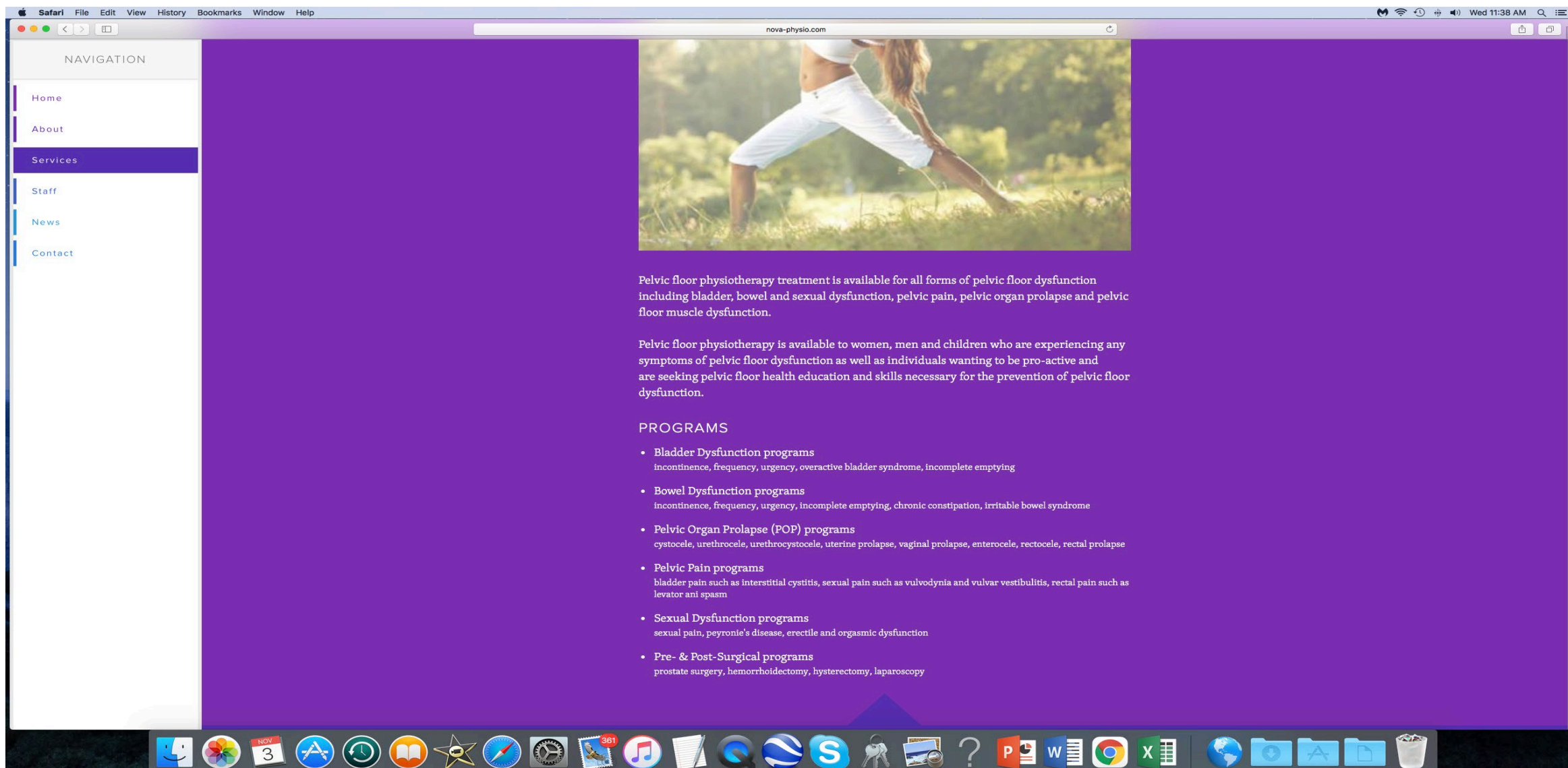


- Biweekly, visual/verbal feedback
- 6 sessions, 60 min each
- Home exercises 20 min bid
- Daily stool diary
- Laxatives daily/prn

- Initial Training
- Practice 20 min bid at home
- Daily stool diary, Pressure Display Log
- 3 Monthly monitoring visits
- Laxatives daily/prn


**Symptoms, Stool Diary, VAS, Colonic Transit, ARM, Balloon Expulsion test**

# Biofeedback/Pelvic Floor Physiotherapy



NAVIGATION

- Home
- About
- Services
- Staff
- News
- Contact

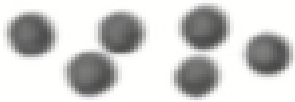








Pelvic floor physiotherapy treatment is available for all forms of pelvic floor dysfunction including bladder, bowel and sexual dysfunction, pelvic pain, pelvic organ prolapse and pelvic floor muscle dysfunction.

Pelvic floor physiotherapy is available to women, men and children who are experiencing any symptoms of pelvic floor dysfunction as well as individuals wanting to be pro-active and are seeking pelvic floor health education and skills necessary for the prevention of pelvic floor dysfunction.

### PROGRAMS

- **Bladder Dysfunction programs**  
incontinence, frequency, urgency, overactive bladder syndrome, incomplete emptying
- **Bowel Dysfunction programs**  
incontinence, frequency, urgency, incomplete emptying, chronic constipation, irritable bowel syndrome
- **Pelvic Organ Prolapse (POP) programs**  
cystocele, urethrocele, urethrocystocele, uterine prolapse, vaginal prolapse, enterocele, rectocele, rectal prolapse
- **Pelvic Pain programs**  
bladder pain such as interstitial cystitis, sexual pain such as vulvodynia and vulvar vestibulitis, rectal pain such as levator ani spasm
- **Sexual Dysfunction programs**  
sexual pain, peyronie's disease, erectile and orgasmic dysfunction
- **Pre- & Post-Surgical programs**  
prostate surgery, hemorrhoidectomy, hysterectomy, laparoscopy

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on the surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces. <b>Entirely liquid</b>

**Fig. 36.3.** The Bristol stool form scale.

Must include 1 month of at least 2 of the following in infants up to 4 years of age:

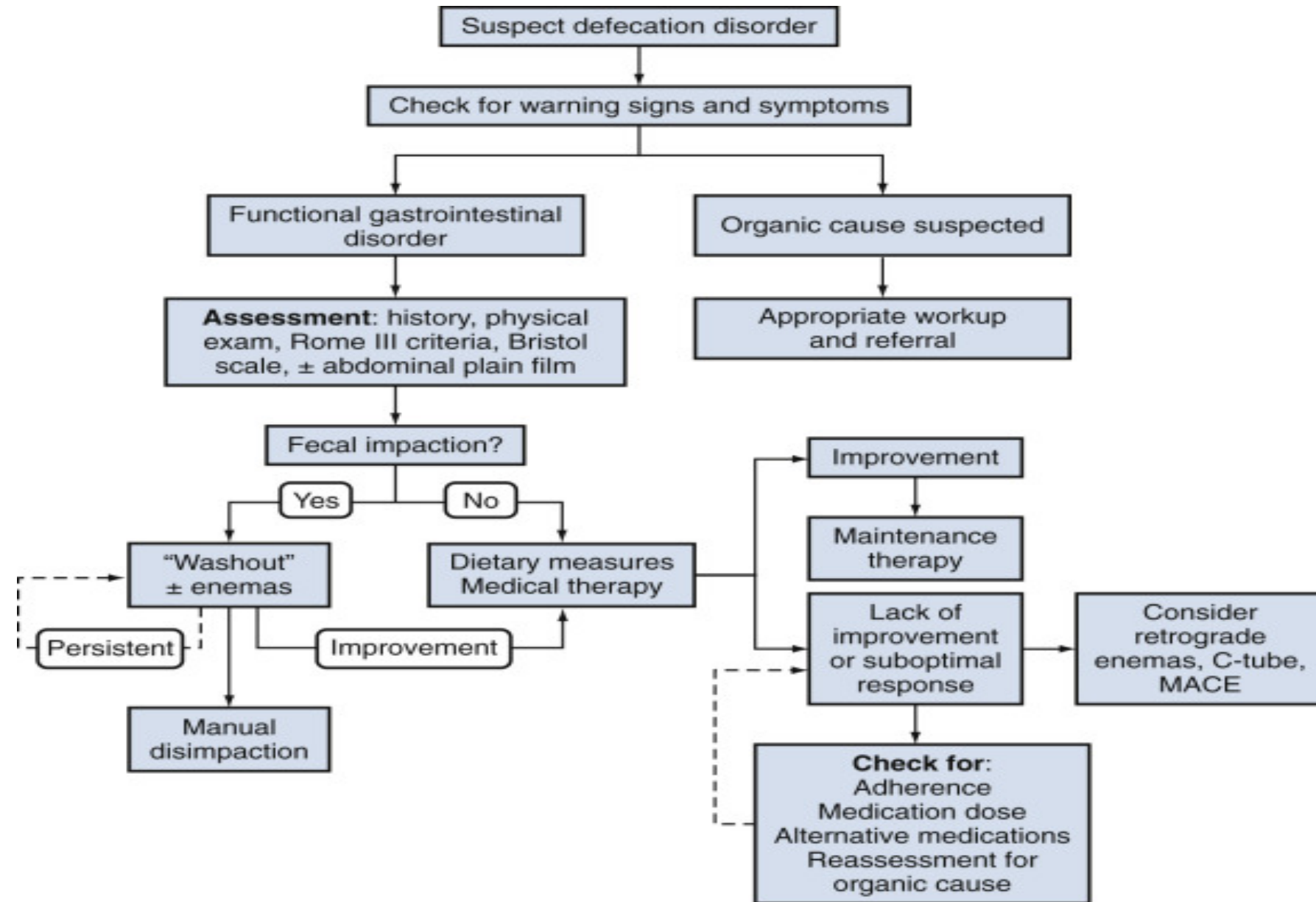
1. 2 or fewer defecations per week
2. History of excessive stool retention
3. History of painful or hard bowel movements
4. History of large-diameter stools
5. Presence of a large fecal mass in the rectum

In toilet-trained children, the following *additional* criteria may be used:

6. At least 1 episode/week of incontinence after the acquisition of toileting skills
7. History of large-diameter stools that may obstruct the toilet



# Constipation



# Maintenance Therapy

- **PEG is well tolerated, making it the preferred choice in many centres**
  - (*RestoroLAX<sup>®</sup>; Lax-A-Day<sup>®</sup>; MiraLAX<sup>®</sup>*)
  - Dose: 0.2-0.8 g/kg/d (*one scoop is 17g*) given OD or BID & adjust as needed
- Lactulose is next option if PEG not available (1-2g/kg given OD or BID)
- Maintenance therapy:
  - Should continue for at least 2 months, w/ symptom resolution for at least 1mo prior to attempting gradual wean
  - If child in process of toilet training, do not stop until training successful & w/o symptoms

- Combs et al., 2013

- 368 LUTD

- 50% reporting encopresis did not have constipation but had overactivity

- Worst urgency were the ones with more encopresis

- Initiation of anticholinergic therapy, encopresis resolved even before the urgency resolved

- ? Overactivity of the detrusor and the rectal wall musculature

# Anticholinergics

- Solifenacin: May increase the mean and maximum voided volumes in children with OAB, but it may not be different from placebo in improving incontinence or number of daily voids (off-label use) (GRADE level: Low).
- Propiverine: May increase mean voided volumes and modestly reduce daily frequency compared to placebo in children with OAB (GRADE level: Moderate).
- Tolterodine extended-release may result in a small decrease in urge incontinence in children with OAB (average 1.4 incontinence episodes per week) when compared to placebo (off-label use) (GRADE level: Moderate).
- no evidence of difference between oxybutynin and cognitive therapy in cure rate of incontinence in children with OAB (GRADE level: Low).

---

Authors initiate pharmacotherapy (anticholinergics &/or  $\alpha$ -blockers) when all other conservative measures have been exhausted

---

**Anticholinergics (i.e., antimuscarinics) are the current gold standard in the treatment of patients w/ symptoms referable to OAB**

---

Oxybutynin (*Ditropan*<sup>®</sup>) & tolteridone (*Detrol*<sup>®</sup>) are the only anticholinergics that are FDA (*USA*) approved for children

---

Oxybutynin (*Ditropan*<sup>®</sup>) & propiverine (*Mictoryl*<sup>®</sup> *Pediatric*) are the only anticholinergics that are Health Canada approved for children