# Constipation: Clinical scenarios

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**Pediatric Gastroenterologist**
**And constipatiologist**

# Faculty/Presenter Disclosure

- **Faculty: Felipe Briglia**
- **Relationships with commercial interests:**
  - **none**

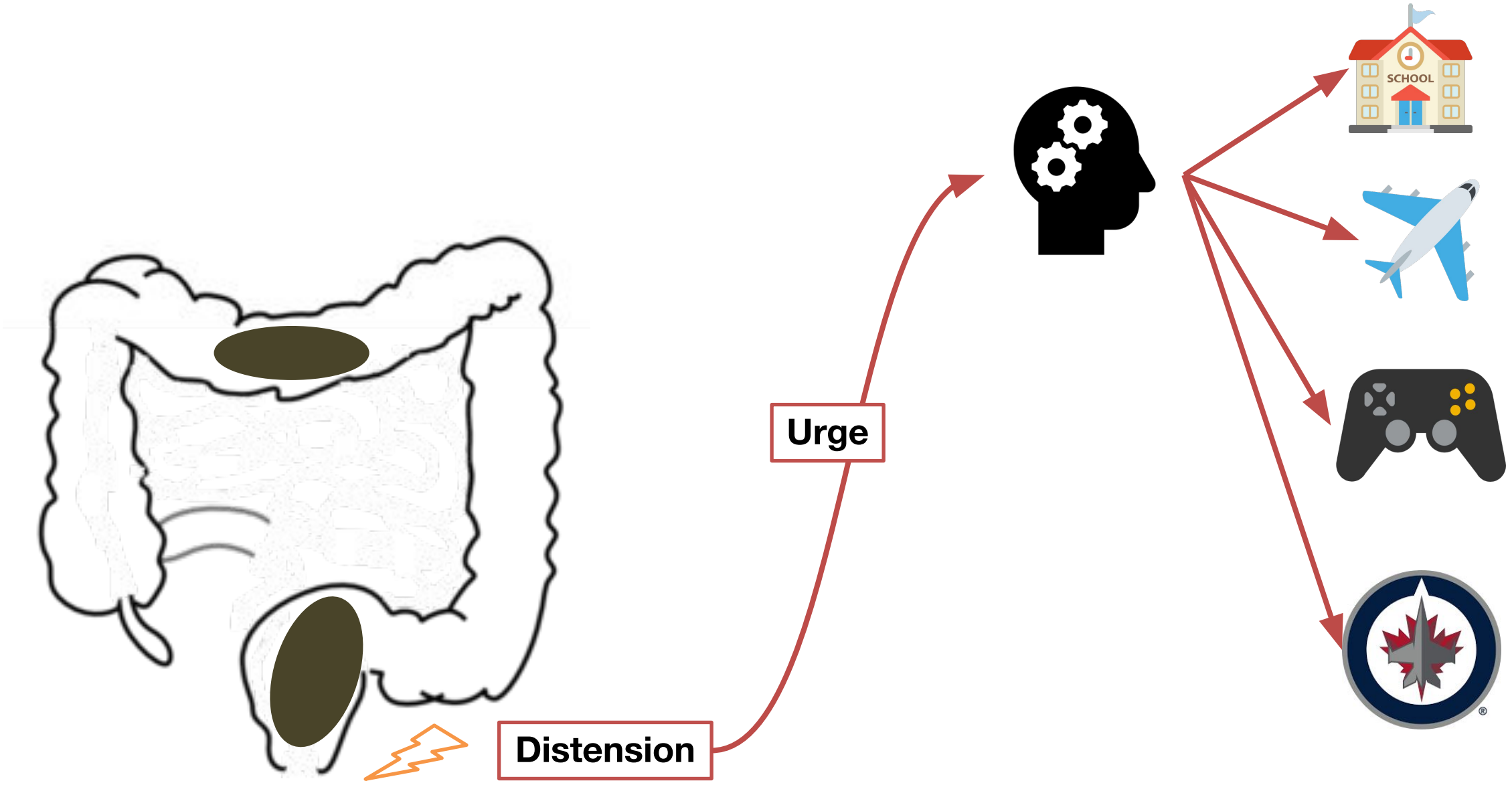
# Agenda/Objectives

1. Take somethings out of the way - To review the physiopathology of functional constipation
2. When should we worry EVEN MORE - Review alarm signs
3. What should we be ordering - Baseline investigations
4. Defining poor response to treatment and how to proceed
5. Overview of other testing and procedure in refractory constipation

# Case 1

- 7 yo boy with bowel motions every 5 days, “baseball”, clogging toilet
- Bright red blood around the stools and toilet paper
- Sits on the floor and crosses his legs to hold stools inside
- Extremely scared of the toilet, yet he is toilet trained for urine
- Good growth, unremarkable FHX
- PMHx – good pooper as infant, unremarkable neonatal history, no allergies, can be picky when more than 3 days with no BM, energy is great.
- Also has post-prandial abdominal pain when not stooling.

# Physiopathology of Functional Constipation



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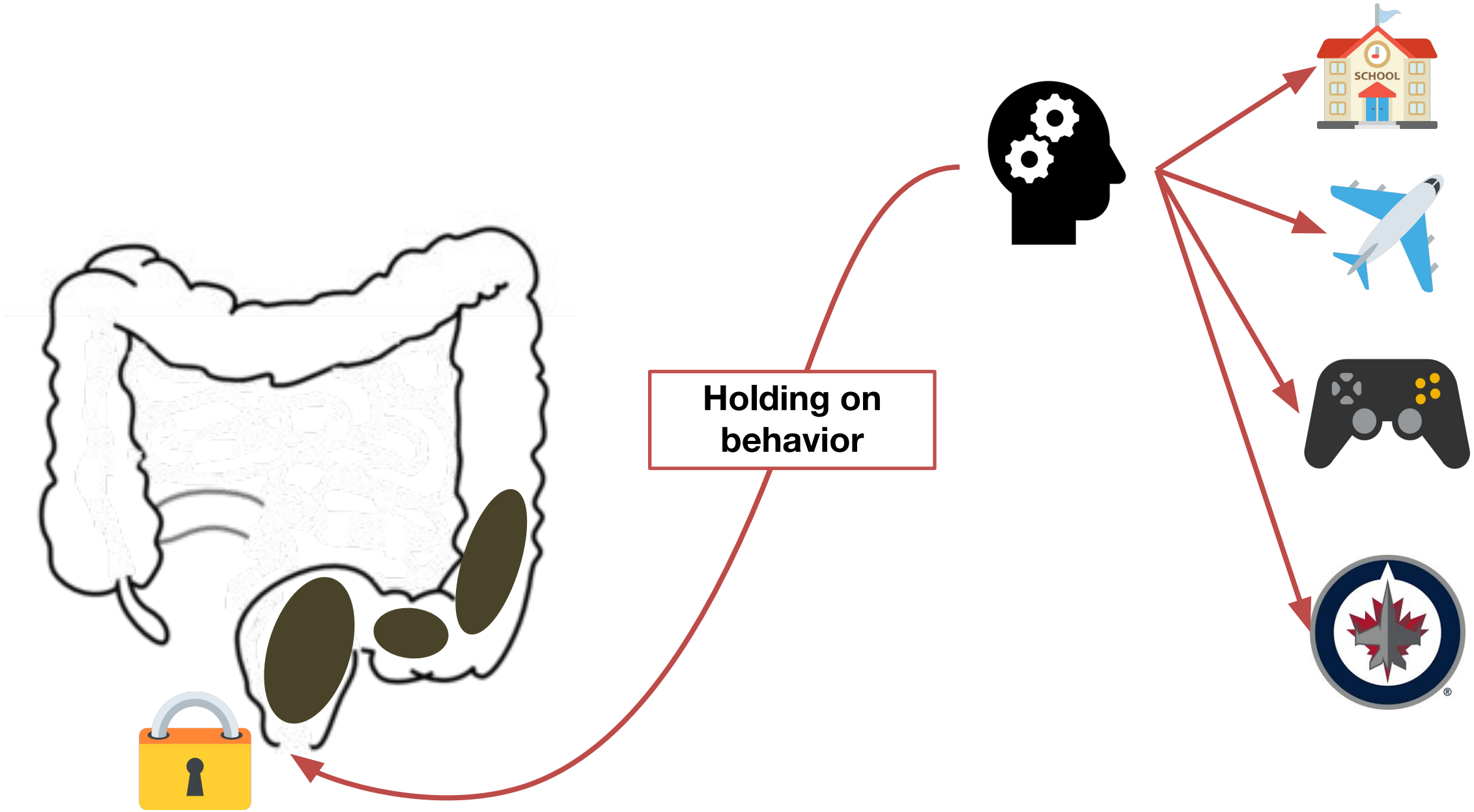

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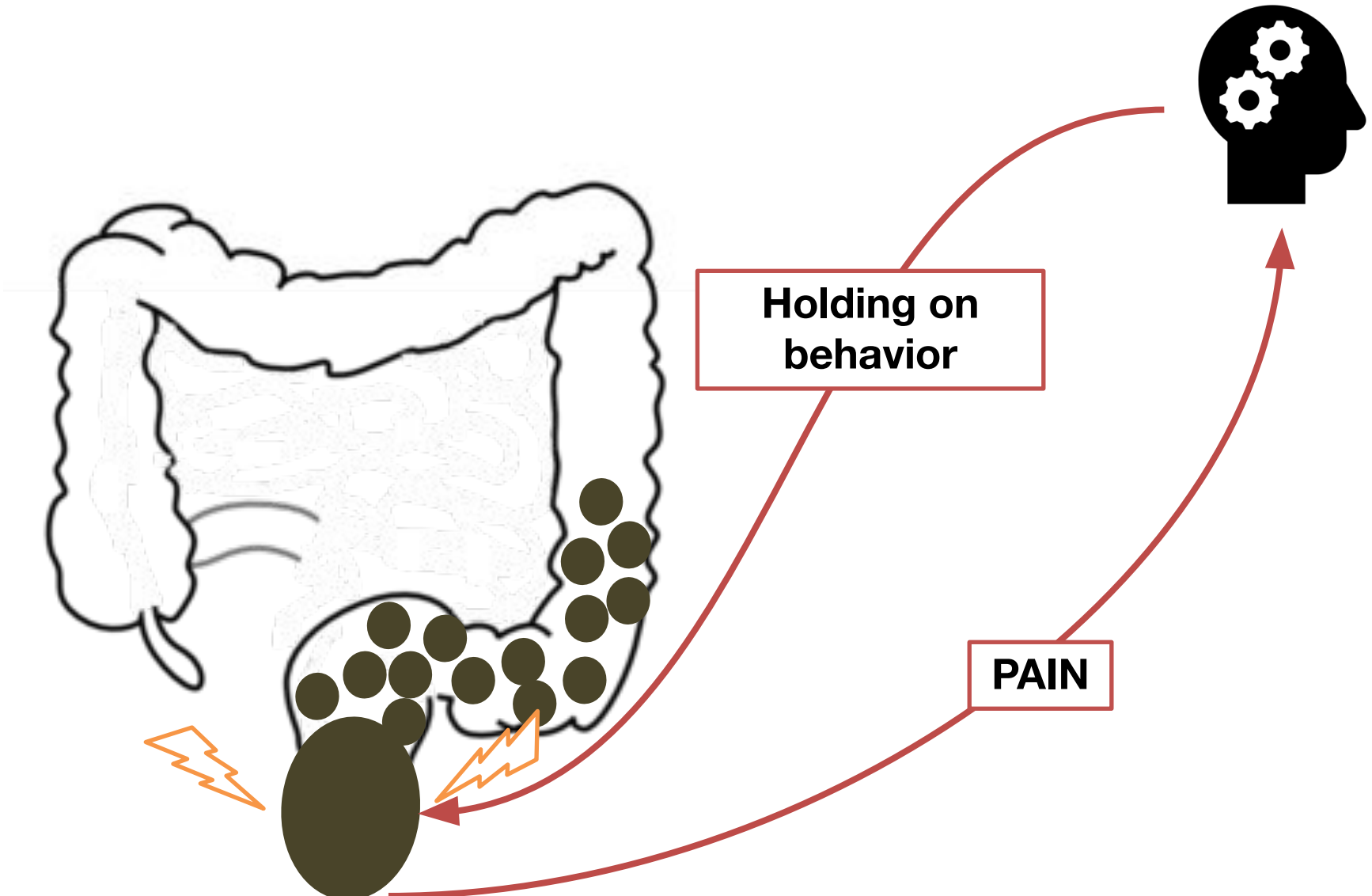

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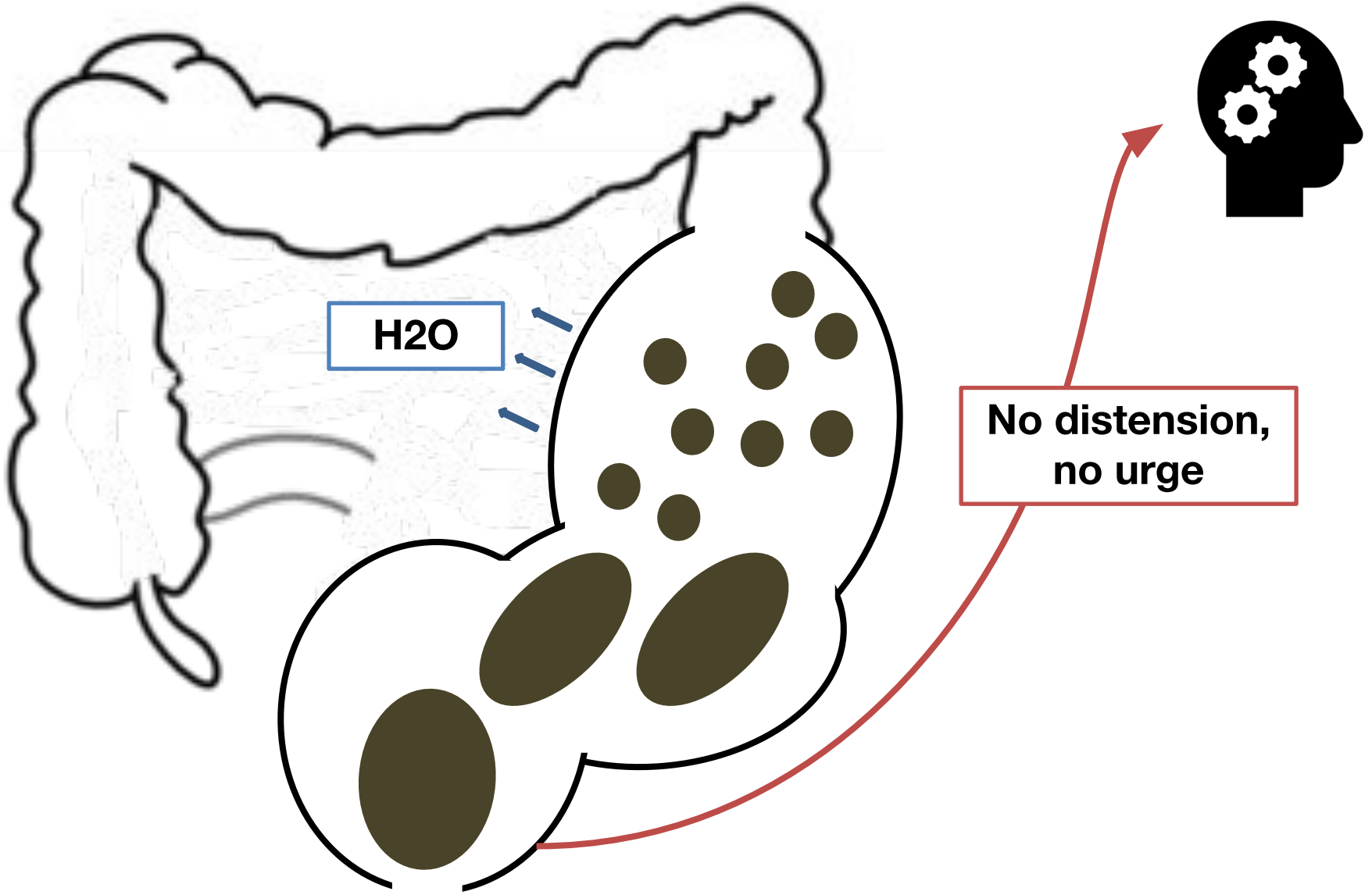

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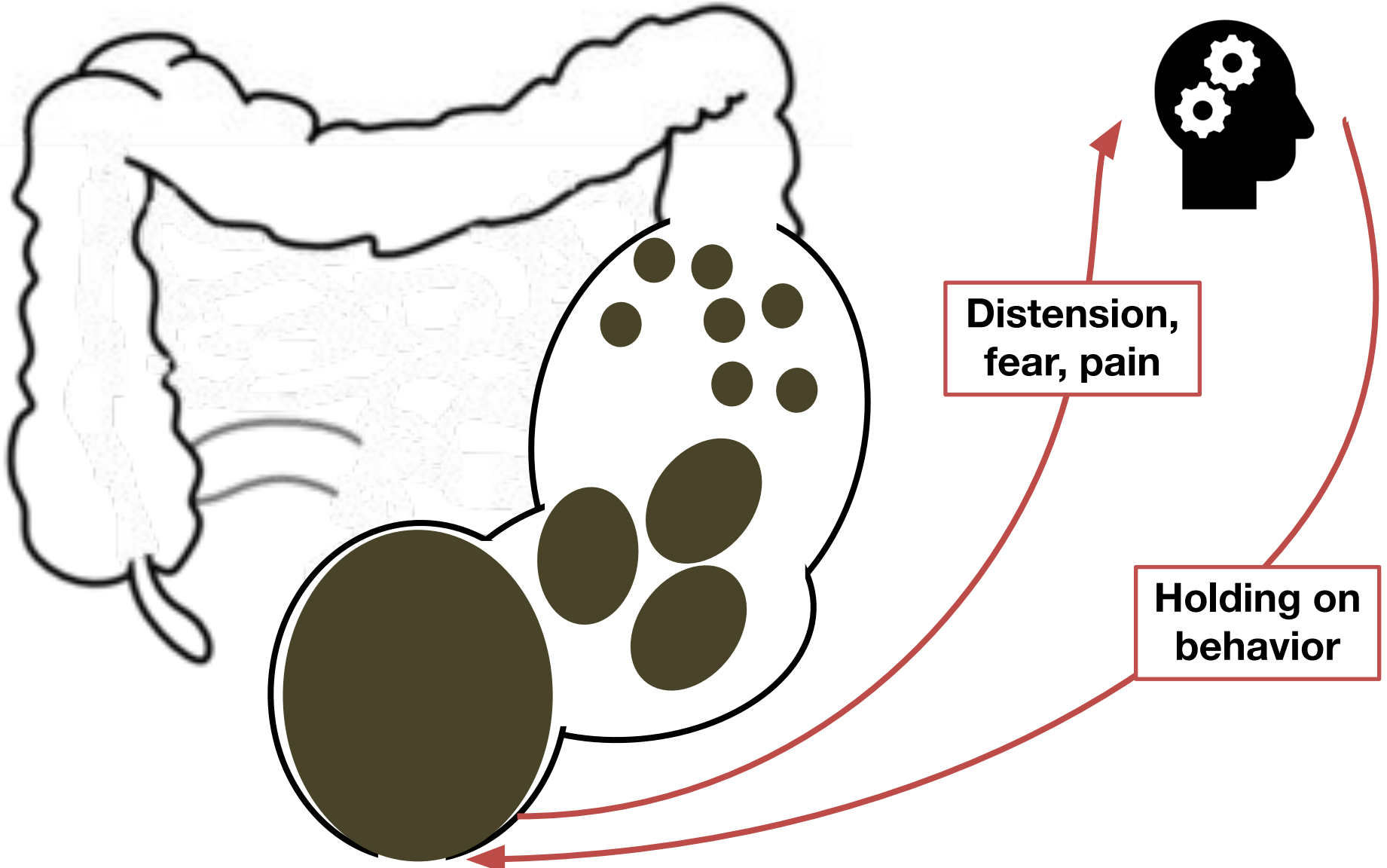

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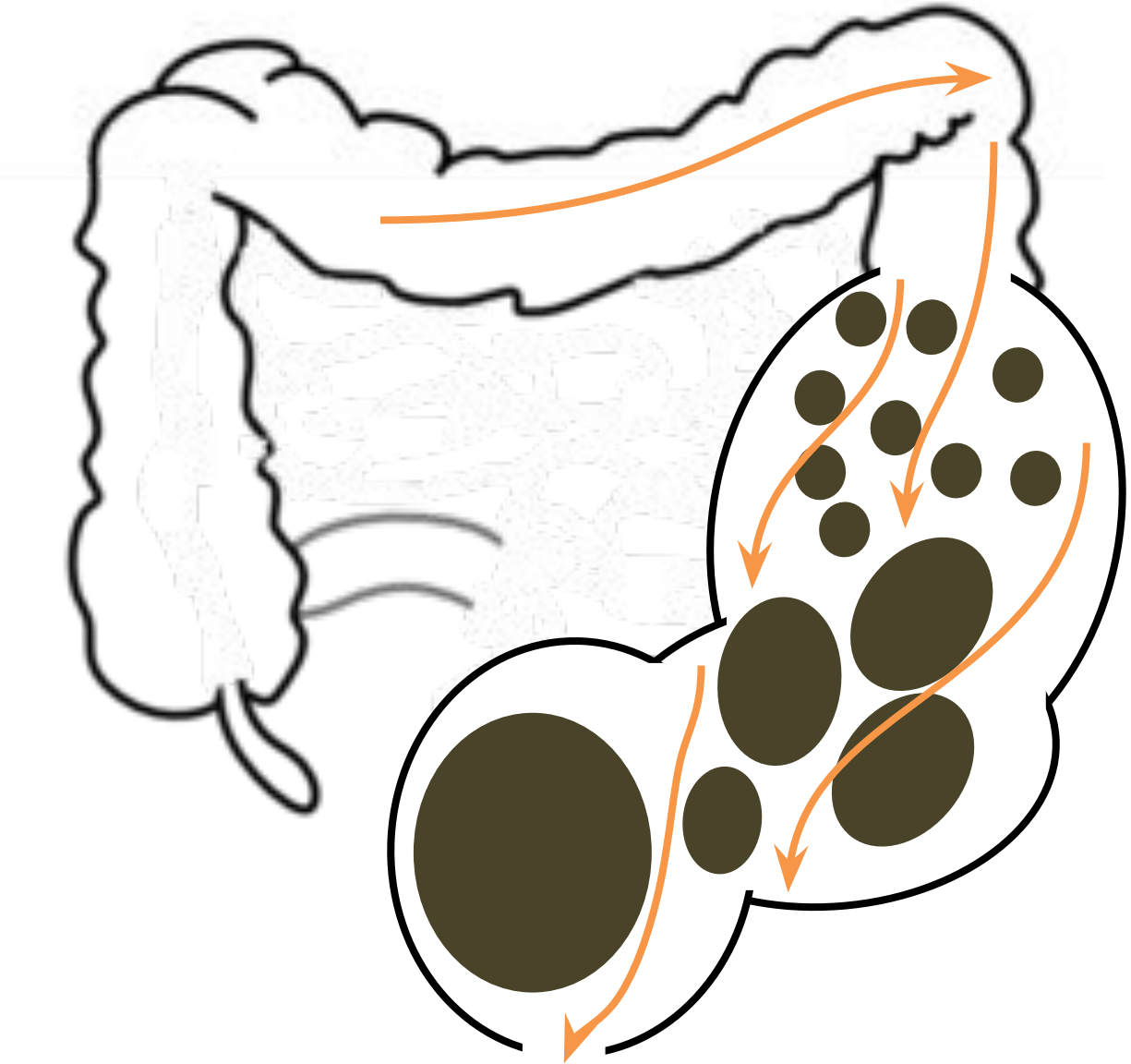


**Overflow**

**Soiling**

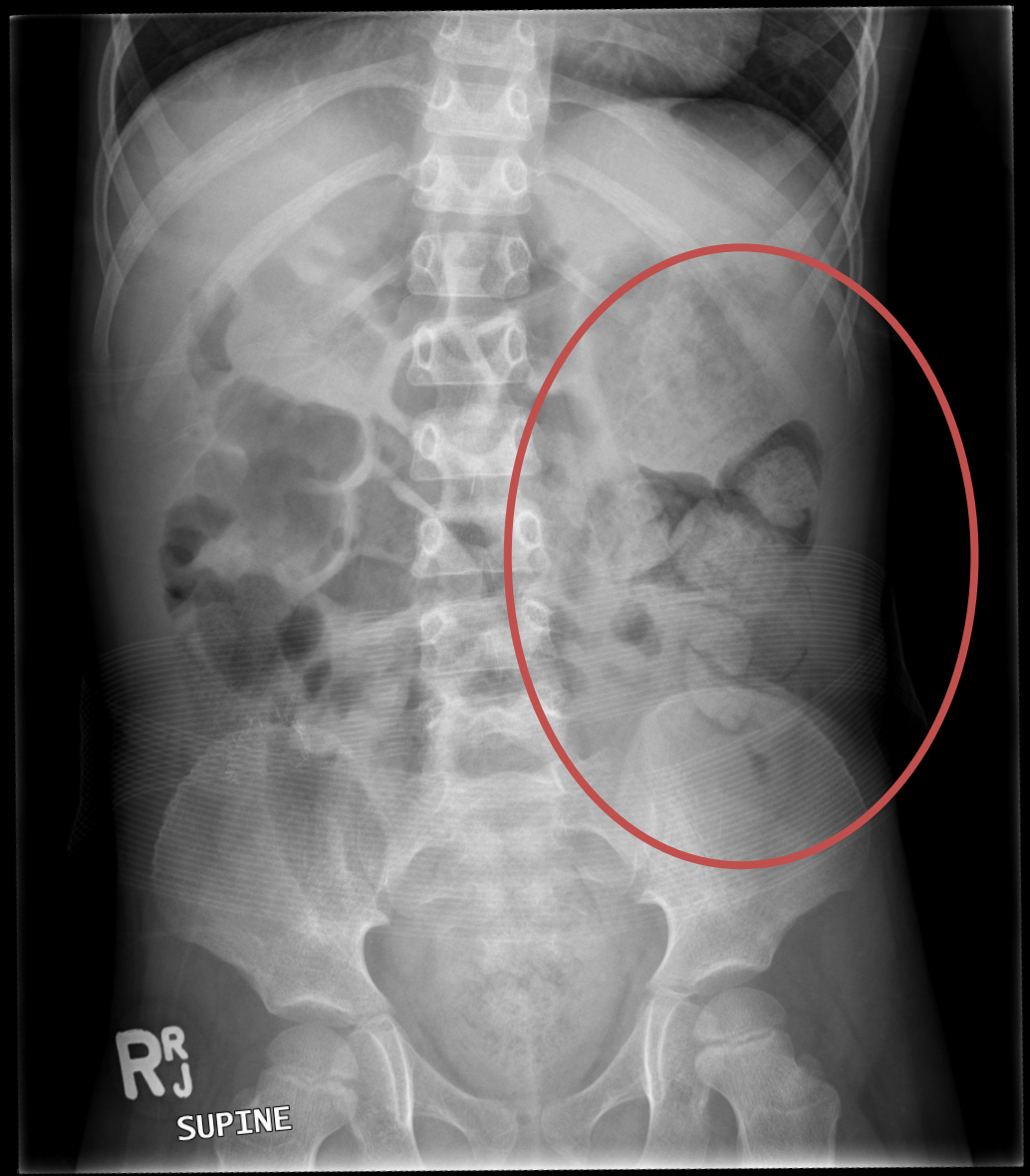
**“Sneaky poop”**

**YouTube:**
**”the poo in you”**

# Frequent Misconceptions

- Constipation ***vs*** bowel frequency
- High volume overflow ***vs*** diarrhea
- Holding on ***vs*** pushing
- Stools on x-ray ***vs*** constipation

# Abdominal Radiography

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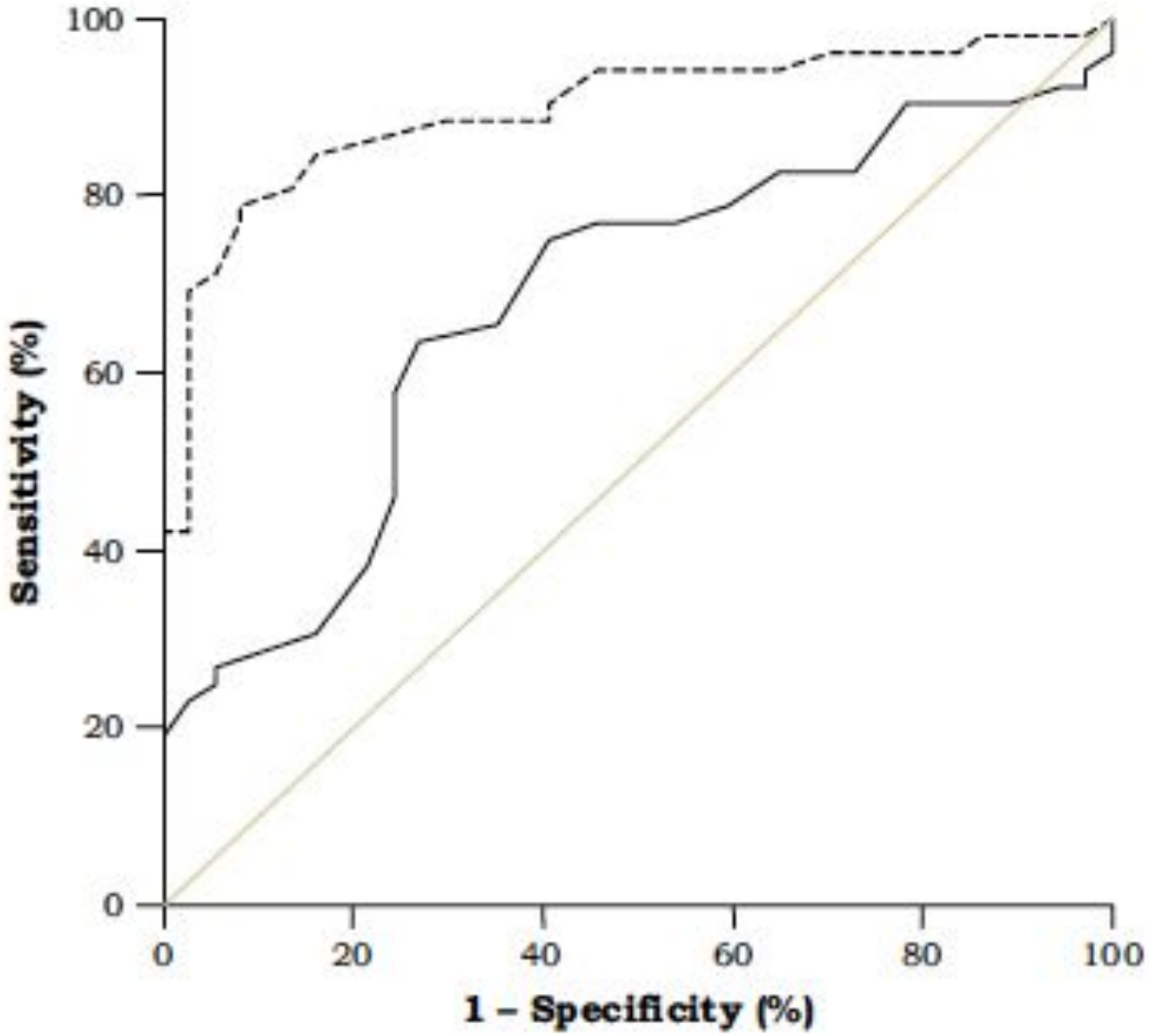



Leech AUC (0.68; 95% CI 0.58–0.80)

CTT method (0.90; 95% CI 0.83–0.96)

*"In conclusion, evidence supports not using an abdominal radiography to diagnose functional constipation."*

Tabbers et al. JPGN 2014

Lorjin et al. Pediatr Radiol (2006)

# Case 1 – what would you order?

*"we do not recommend routine laboratory testing for hypothyroidism, celiac disease, and hypercalcemia in children with constipation in the absence of alarm symptoms."*

Tabbers et al. JPGN 2014

- CBC, iron studies, albumin, lytes, urea, creatinine
- TSH
- Celiac screen – Tissue transglutaminase IgA AND total IgA
- Consider: sweat chloride test

# Alarm Signs

| | |
|---|---|
| Early Start (< 1mo) | Bilious vomiting |
| Passage of meconium > 48h | Abnormal thyroid gland |
| Family history of Hirschsprung | Severe abdominal distension |
| Ribbon stools | Perianal fistula |
| Blood in stools (absence of fissure) | Abnormal position of the anus |
| FTT | Absent anal or cremasteric reflex |
| Fever | Decreased lower extremity strength, tone, reflex |
| Extreme fear during anal inspection | Tuft of hair on spine |
| Anal scars | Sacral Dimple/gluteal cleft deviation |

Tabbers et al. JPGN 2014

# Differential Diagnoses

## Younger

- Celiac disease
- Hypothyroidism, hypercalcemia, hypokalemia
- Dietary protein allergy
- Vitamin D intoxication
- Cystic Fibrosis
- Hirschsprung Disease
- Anal Achalasia
- Spinal cord anomalies, trauma, tethered cord
- Anatomic malformations (imperforated anus, anal stenosis)
- Abnormal abdominal musculature

## Older

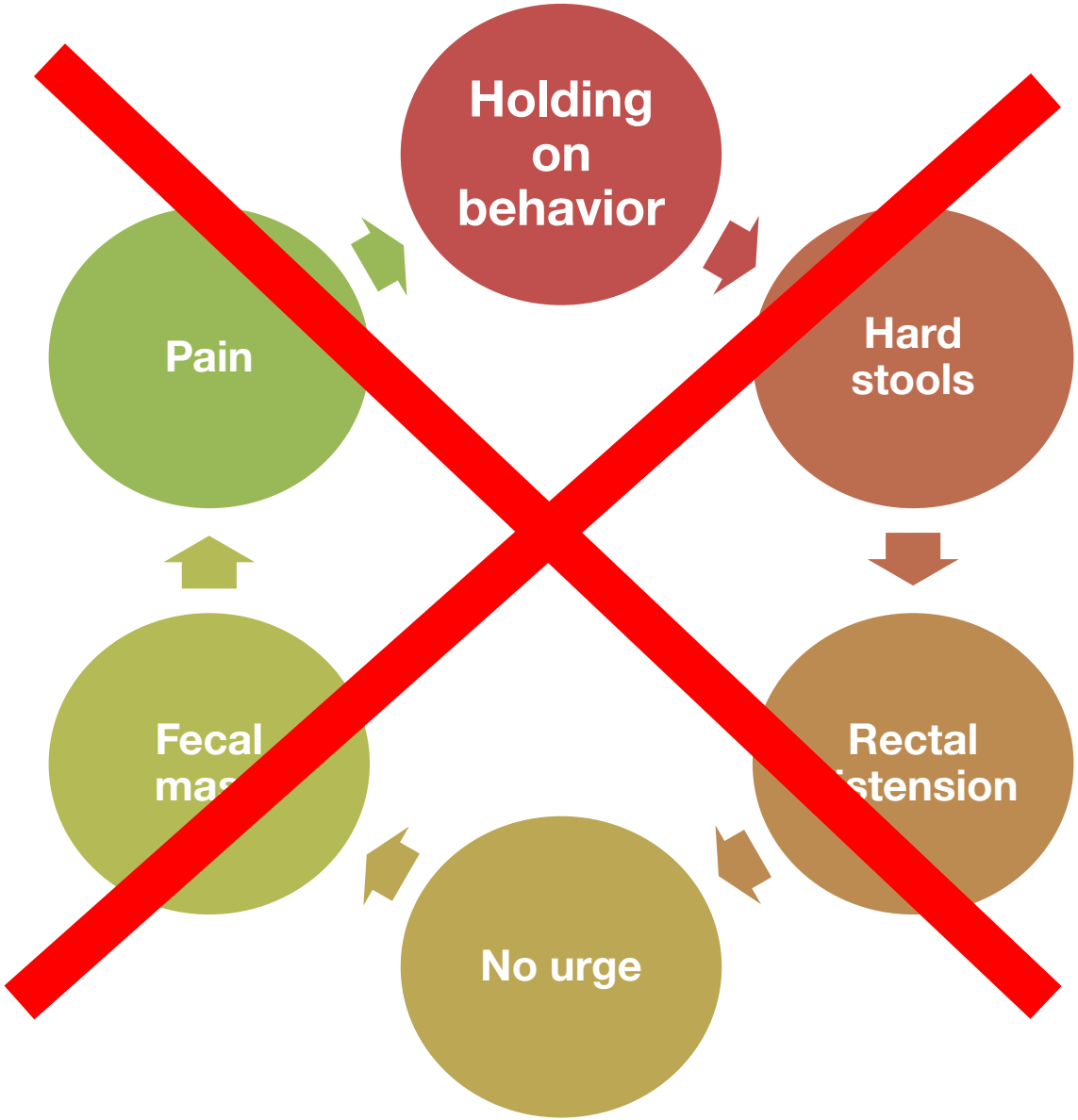
- Diabetes mellitus
- Colonic Inertia
- Multiple endocrine neoplasia type 2b

## Both

- Drugs
  - Opiates
  - Anticholinergics
  - Antidepressants
  - Chemo
  - Heavy metal ingestion
- Botulism
- PIPO

Tabbers et al. JPGN 2014

# Treatment


Holding on behavior
Hard stools
Rectal
stension
No urge
Fecal
Pain

# Osmotic Laxatives

| Laxative | Dose | Pros | Cons |
|---|---|---|---|
| **PEG (3350-4000)**<br>Disimpaction<br>Maintenance | <br>1-1.5g/kg/day (up to 6 days)<br>0.2-0.8g/kg/day | No taste<br>Well tolerated | ? Cost<br>? Texture<br>Occasional abdominal pain bloating |
| **Lactulose** | 1-2g/kg once or twice/day | Taste ? | Distension, cramping, taste, volume |
| **Milk of Magnesia** | 2–5 y: 0.4–1.2 g/day<br>6–11 y: 1.2–2.4 g/day<br>12–18 y: 2.4–4.8 g/day | Cost | TASTE TASTE TASTE<br>HyperMg, hypophosphatemia and secondary hypocalcemia |
| **Mineral Oil** | 1-3ml/kg/day, max 90ml | Cost | Taste, risk of aspiration, leakage |

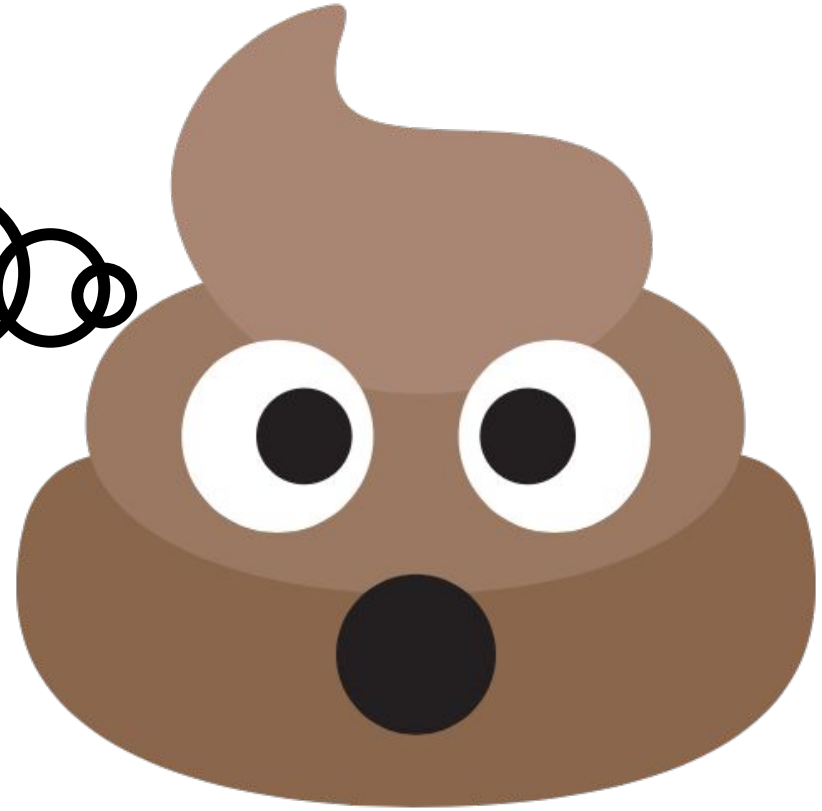
Rowan-Legg. Paediatr Child Health. 2011
Tabbers et al. JPGN. 2014

# Back to Case 1

- 7 yo boy with bowel motions every 5 days, “baseball”, clogging toilet
- You decide to start him on PEG – recommended dose for his age
- Parents call 4 weeks later saying that PEG dose initially caused incontrollable diarrhea, so they elected to reduce the dose in half and he is now not responding to PEG
- You find out they are diluting the PEG in the school water bottle which comes back just half full (or half empty).

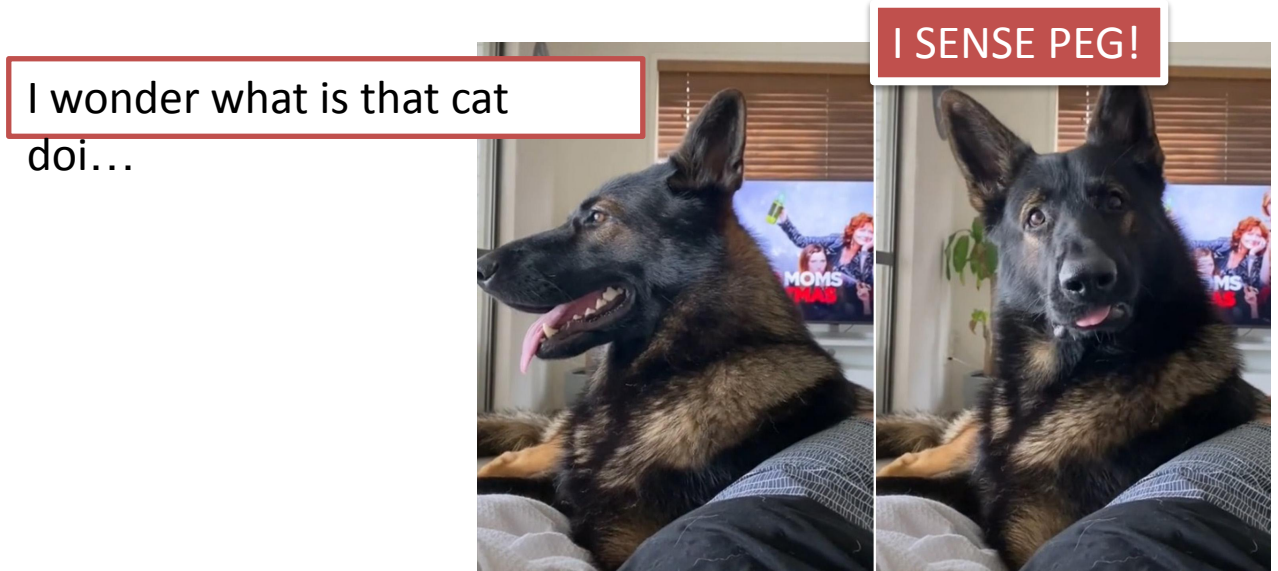
# Treatment

**OMG PEG IS FAILING. WHAT NOW?**



# Let's define "NOT responding to PEG"

- Droplet of wisdom #1
- "*An osmotic laxative is only as good as if INSIDE the colon*"
  - Try different strategies
  - **Not to** spread the dose over too many hours
  - Continuous use is imperative
  - Little German Shepherd – try different medicine



# Let's define "NOT responding to PEG"

- Droplet of wisdom #2

"*There is no such thing as too much PEG*"

- Where is PEG first metabolized?
  - Cytochrome P450? Kidneys? Enterocyte?

- No stimulation of the gut – WILL NOT make the bowel lazy – quite the opposite
- PEG can initially increase amount of accidents
- And then some guts are just too slow…

# Case 2

- 13 yo girl constipation started from first few months of life.
- Has seen Peds Sx on the first year of life and rectal biopsy showed normal amount of ganglion cells. Initial labwork is normal.
- Has had multiple visits to CHER with washouts both rectally with enemas and with PEG/Sodium picosulfate (Pico-salax). Always effective
- Currently taking 4 capfuls of PEG a day – passing large loose stools q 3days, having accidents once to twice a week.

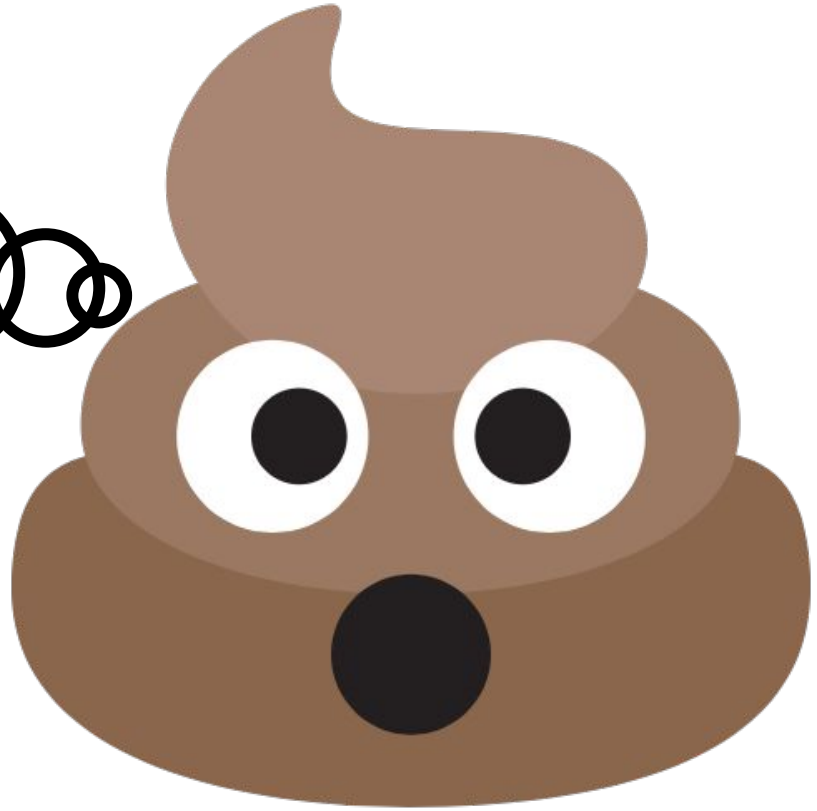
# Refractory Constipation

- **Definition**
  - Fulfil diagnostic criteria
  - Lack of alarm features for organic conditions
  - Fails to improve upon initial treatment
- Consider reliability of information
- Patient expectations
- Poor initial evaluation

Bassotti & Blandizzi. World J Gastrointest Pharmacol Ther 2014

# Treatment

So you're saying there is something else other than PEG?



# Stimulant Laxatives

| Laxative | Dose | Pros | Cons |
|---|---|---|---|
| **Senna** | 2–6 y: 2.5–5 mg /day<br>6–12 y: 7.5–10 mg/day<br>>12 y: 15–20 mg /day | Quick predictable | Abdominal pain, Idiosyncratic hepatitis, melanosis coli, hypertrophic osteoarthropathy, analgesic nephropathy |
| **Bisacodyl** | 3–10 y: 5 mg/day<br>>10 y: 5–10 mg/day | Quick predictable | Cramping, nausea, diarrhea, proctitis (rare) |
| **Sodium picosulfate** | 1 mo–4 y: 2.5–10 mg /day<br>4–18 y: 2.5–20 mg once/day | Small volume, predictable | Taste, cramps |

Rowan-Legg. Paediatr Child Health. 2011
Tabbers et al. JPGN. 2014

# Stimulant laxatives

- Droplet of wisdom #3

"*Senna IS your new best friend*"

- Some patients need stimulation more than softening stools
- ALSO safe long-term use
- Main side effect is abdominal cramping
- Can be used concomitantly with PEG or fibre

# Stimulant laxatives

- *It is not uncommon for patients with chronic constipation who are referred to our center for surgical evaluation to present without a previous trial of stimulant laxatives…Many clinicians are irrationally fearful of using stimulant laxatives, or avoid using them at higher doses or a longer period of time, although there is no evidence that they are harmful.”*

Wood et al. Curr Opin Pediatr 2016

# Back to Case 2

- 13 yo girl constipation started from first few months of life – poor response to PEG
- You decide to start stimulant laxatives and fiber
- Although there is good response, patient is complaining of significant cramping throughout the day which is affecting her daily life.
- She is frustrated with the daily accidents and wish if there is a way she can be clean…

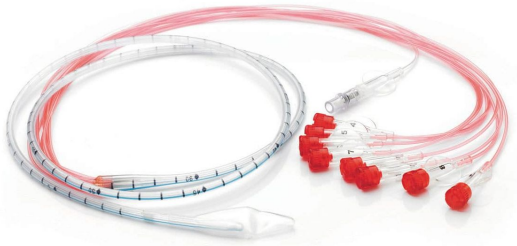
# Multidisciplinary Encopresis Clinic

- Myself, Dr Lum Min, Dr Popescu/Dr Kassem
- Approach to kids with encopresis/refractory constipation
- Colonic scintigraphy
  - Total colonic vs Segmental
- Assessment for bowel care program/surgical management
- Liaise with motility centers for motility studies

# Refractory Constipation – Investigation

## Anorectal Manometry

- Function of the anus and rectum
- Catheters have evolved with time

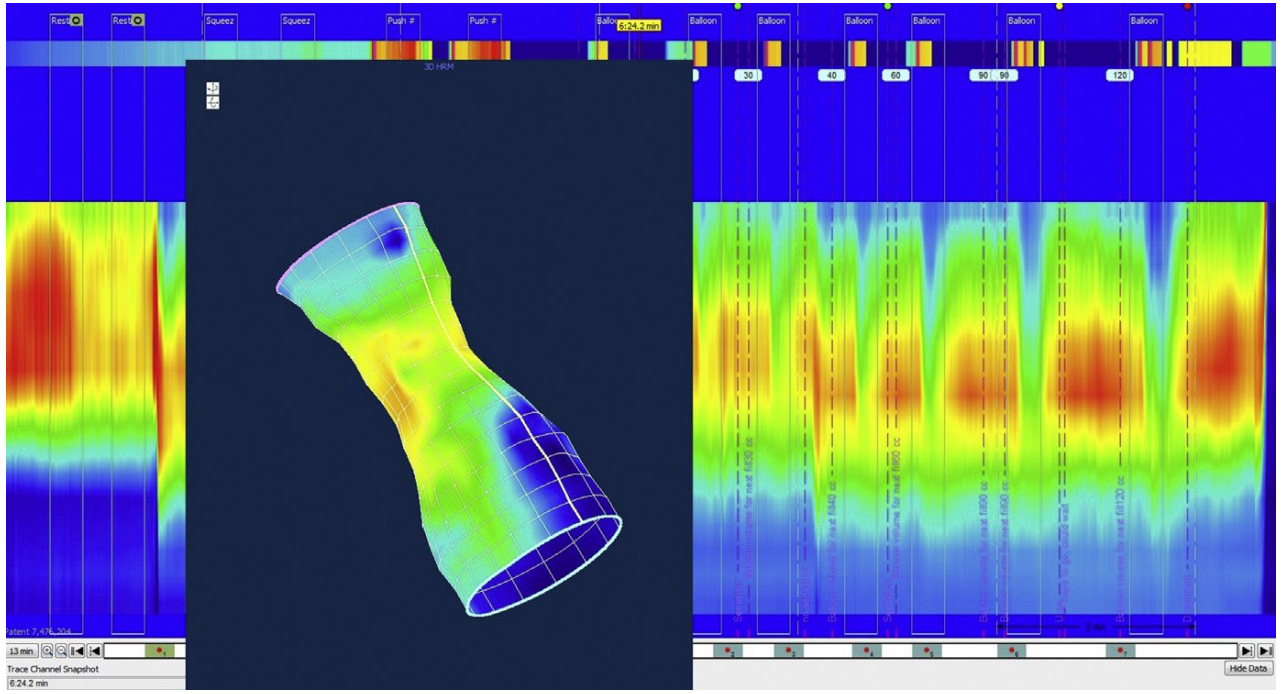


- Resting anal pressure, length of anal canal, rectal sensation, rectoanal inhibitory reflex, evaluation of squeeze and bear-down (push) mechanism and balloon expulsion.
- Can be attempted under sedation – Hirschsprung disease or anal sphincter achalasia.

# Anorectal Manometry

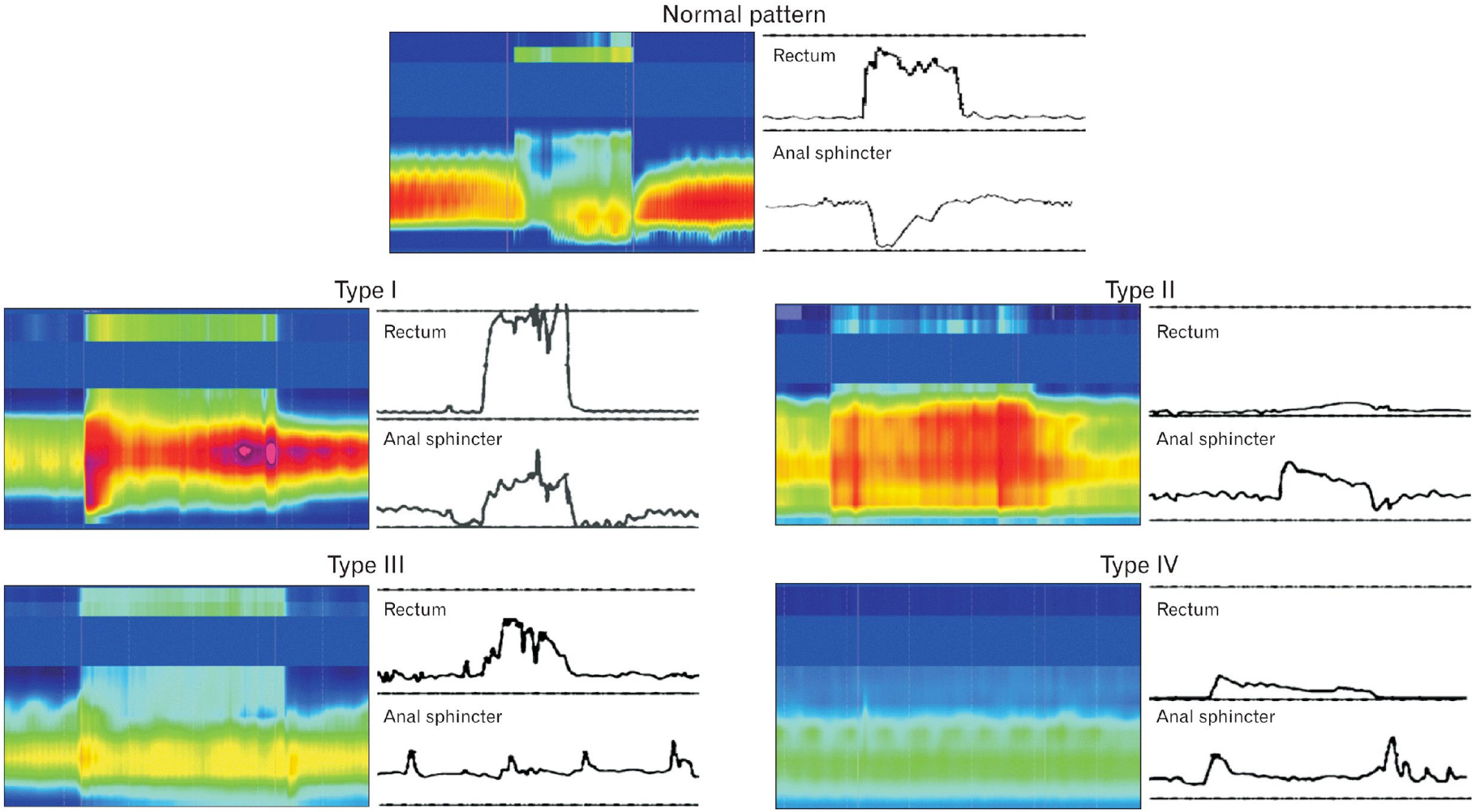
**Indications**:

- Hirschsprung: no RAIR irrespectively of extent
- Anal achalasia: formerly known as ultra-short segment HD
- Neuromuscular: decreased tone
- Anatomical: after surgery
- Fecal incontinence
- Refractory constipation
- Dyssynergic defecation




Lu & Mosa. Gastroenterol Clin N Am 2018

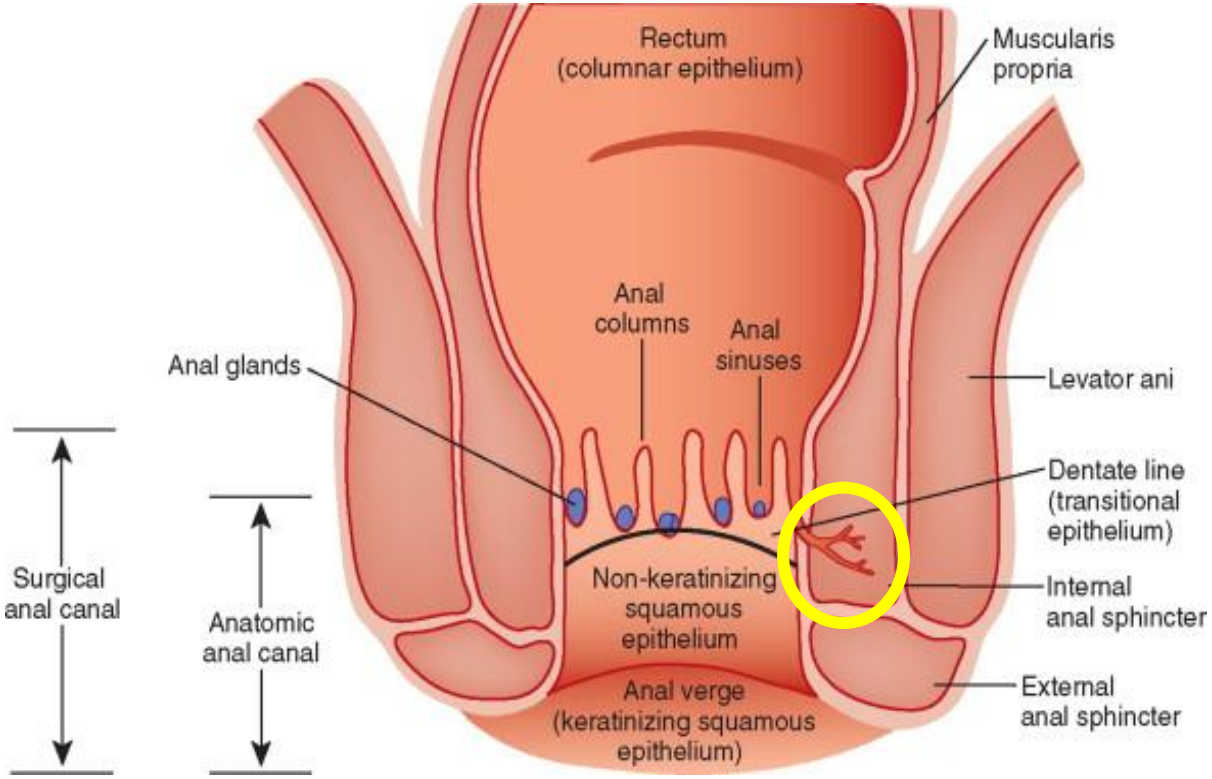
# Dyssynergic Defecation




Rao. J Neurogastroenterol Motil 2016

# Surgical Management - Botox

- **Already described in**
  - Impaired rectal evacuation secondary to Hirschsprung disease
  - Anal sphincter achalasia
  - Anal fissure
- **Relatively easy technique**
  - Under sedation
  - 4 quadrants of the internal anal sphincter
- **Side effects**
  - Transient fecal incontinence
  - Rectal pain
  - Pelvic muscle paresis



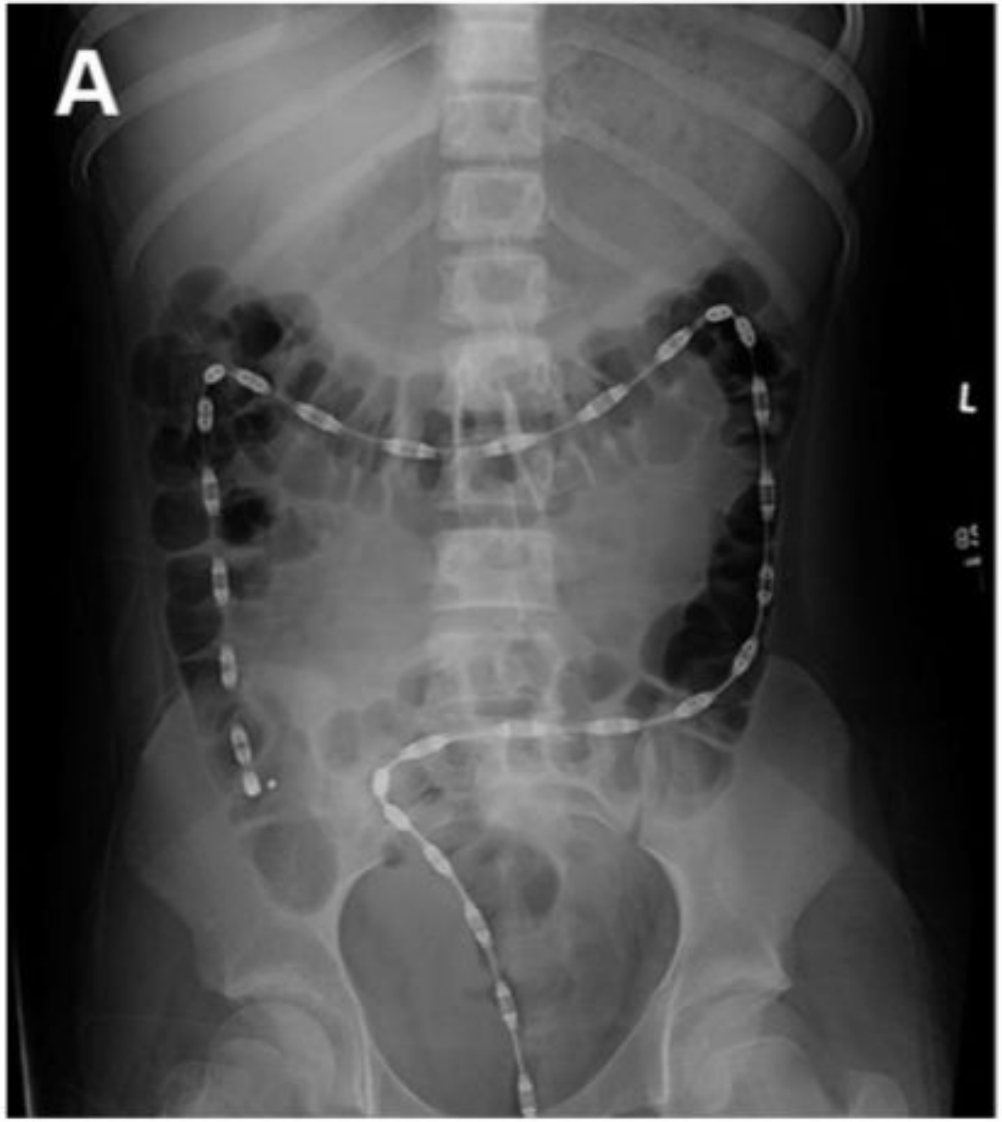

- **Recent survey:** More than half of respondents would use botox to treat refractory FC with an intact RAIR and an increased resting anal pressure.

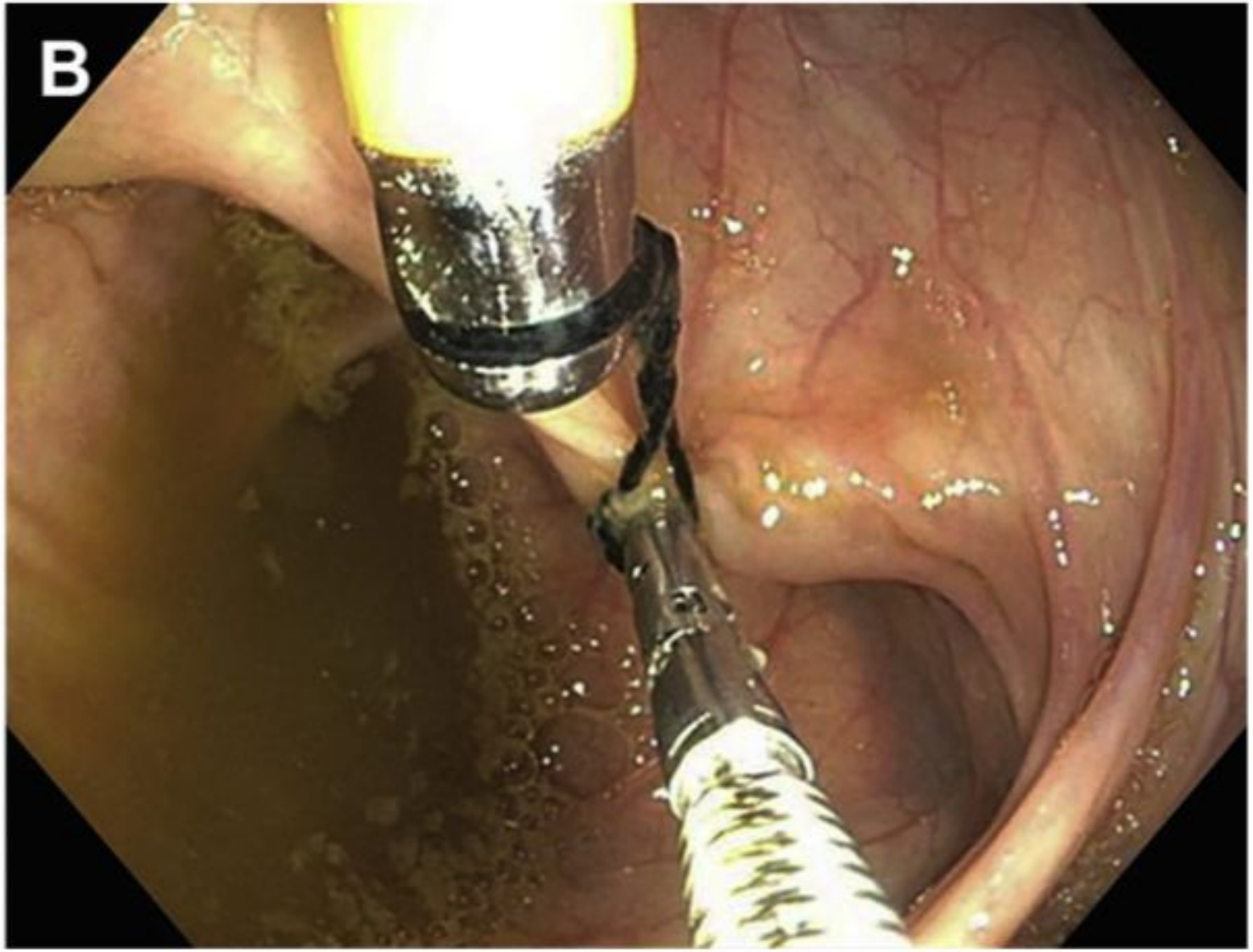
Koppen et al. J Pediatr Surg 2016

# Colonic Manometry

- Assessment of colonic motor activity
- Invasive, time and resource demanding test, with few indications
- High Amplitude Propagating Contractions (HAPC)
- Assessment of response to therapy (bysacodil, glycerin)
- Useful to estimate length of dysmotile colon for surgical options
- Normal colonic manometry  Good response to therapy and surgery

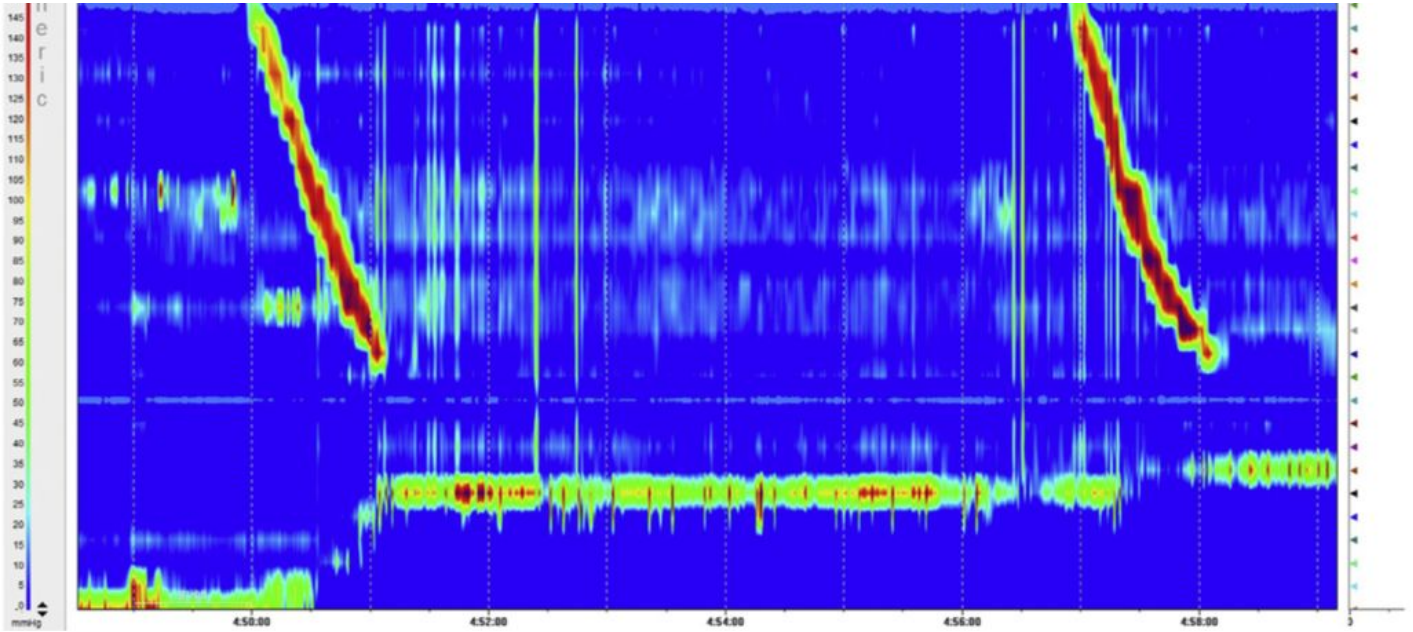
# Colonic Catheter Manometry

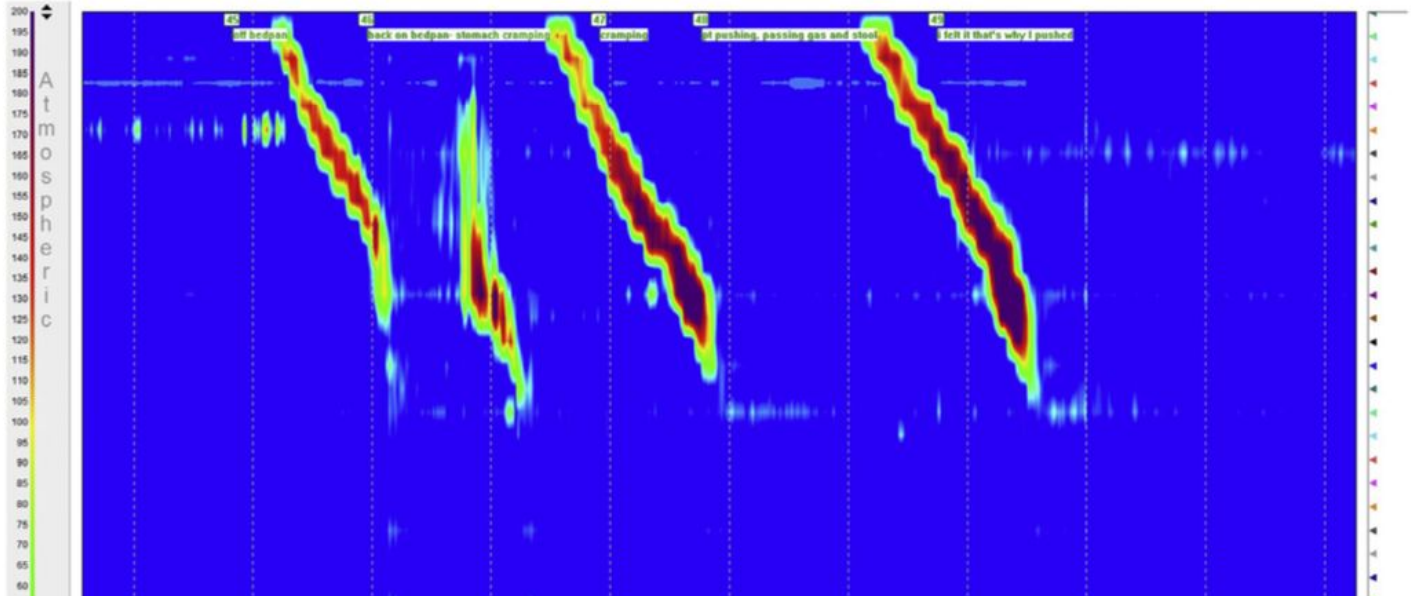



Lu & Mosa. Gastroenterol Clin N Am 2018

# High-Resolution Colonic Manometry




**NORMAL**

**ABNORMAL**

Lu & Mosa. Gastroenterol Clin N Am 2018

# Surgical Management

- "Failed medical therapy"
- Heterogeneity of patients
- Surgical referral protocol:
  - Water contrast enema
  - Regular use of stool softeners
  - Stimulant laxatives + fiber
  - 7-day 'laxative trial' + radiography

- Successful trial: clean colon, regular underwear, and minimal to no discomfort from being on the stimulants.

Wood et al. Curr Opin Pediatr 2016

# Surgical Management

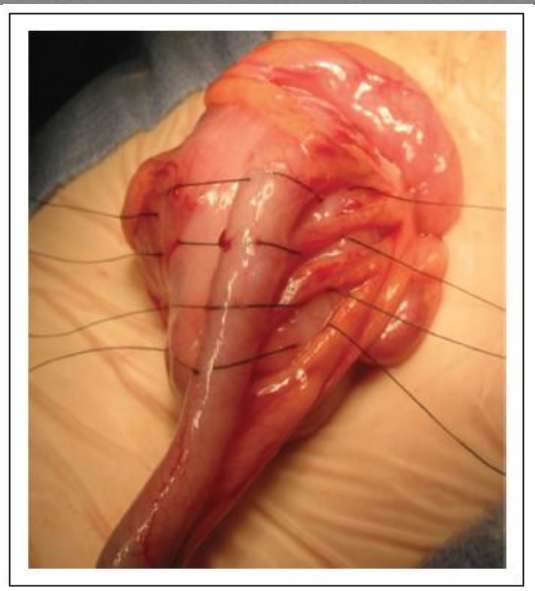
- Antegrade enema:
  - Malone
  - Cecostomy

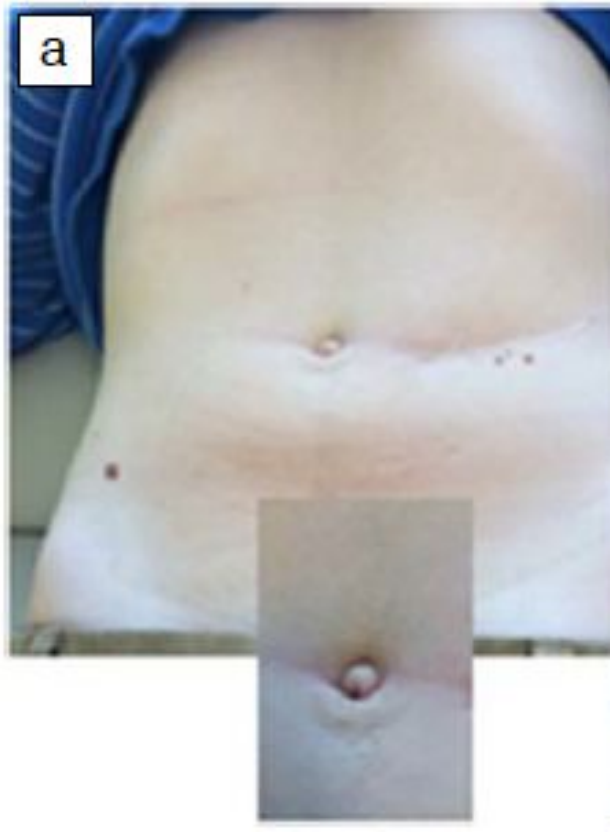
- Regain autonomy

- Complication rate 5-80% □ Pain at catheterization, skin excoriation, stoma leakage/stenosis

Siminas & Losty. Ann Surg 2015

# Surgical Management







**Malone: 5-10% stricture rates**

**Cecostomy**

Wood et al. Curr Opin Pediatr 2016

# Summary

- **Patient education** is key for successful therapy
- Small percentage of patients that **will not respond** to **conventional therapy**
- **Stimulant laxatives** aren't as bad as they seem
- **Clinical/surgical collaboration** is key on refractory cases
- **New therapies** on the horizon (don't hold your breath, though)

**“Pediatric Gastroenterology: The unwearying quest for the perfect consistency”**

Dr Leticia Lopes

# THANK YOU!

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