

The evacuation helpline

—

How to relieve an obstructed patient

PD Dr. med. Henriette Heinrich

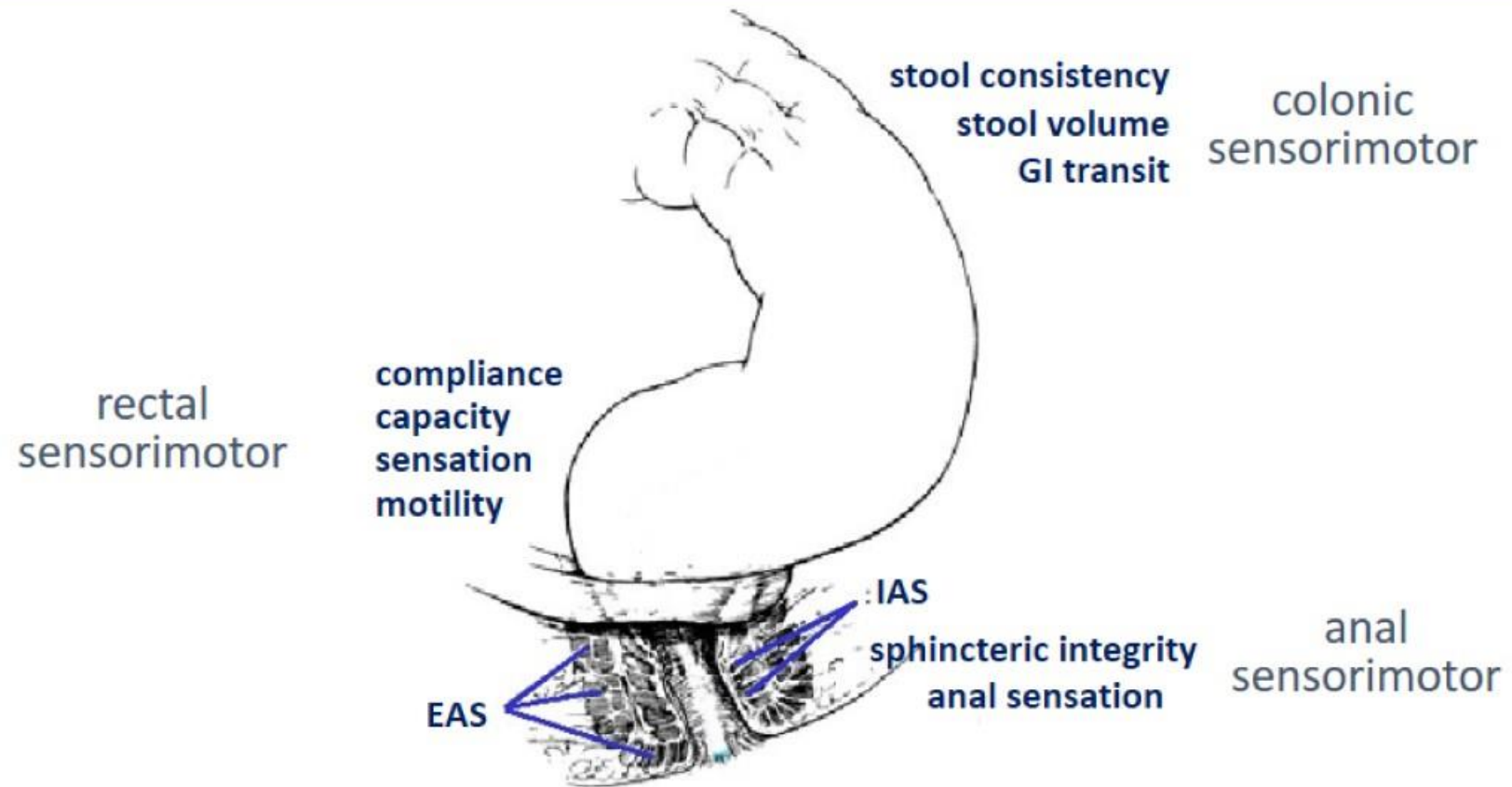
Clarunis Universitäres Bauchzentrum

Gastroenterology and Hepatology

Basel, Switzerland

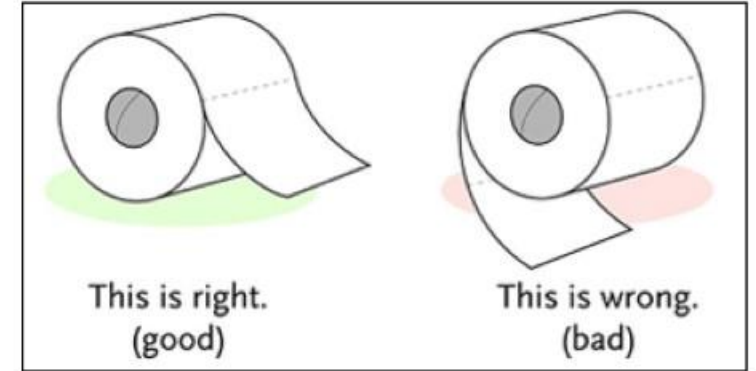


Physiology of continence and defaecation



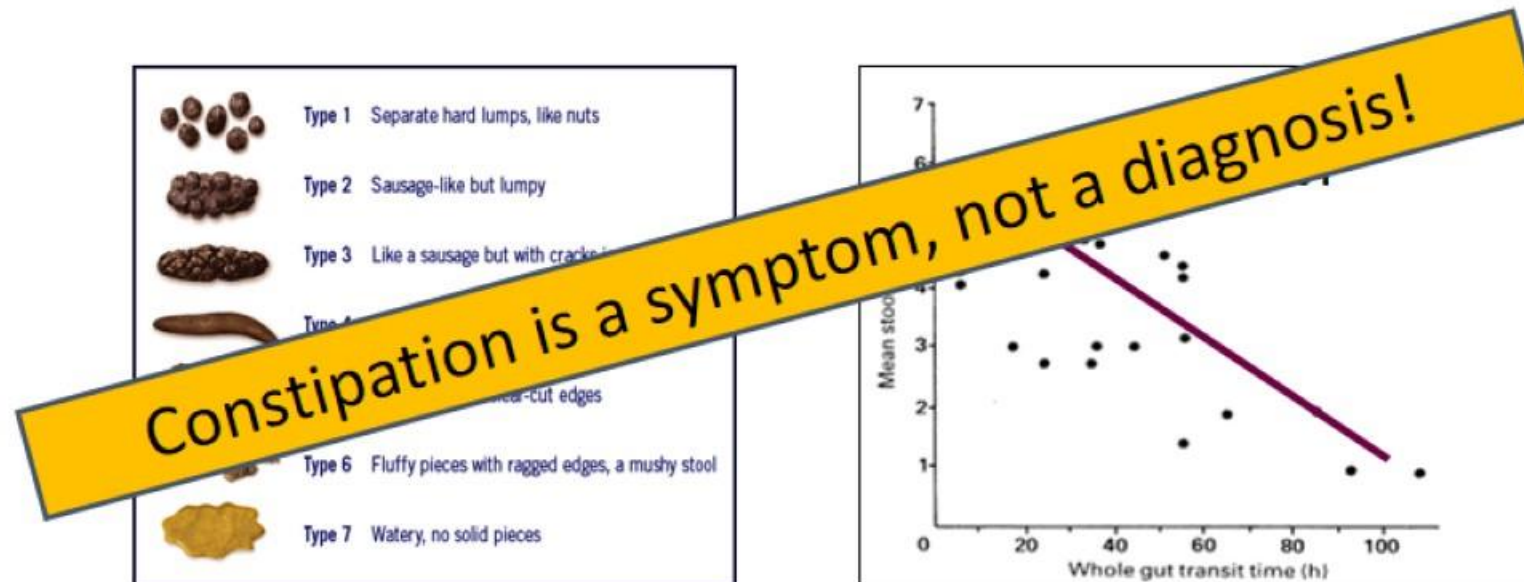
How to help your obstructed patient – FIND THE CAUSE !

- Clinical Diagnosis of Constipation
 - Do we even know what our patients are talking about?
- Diagnosis: Endoscopy and Imaging
 - Do routine investigations identify the causes of constipation?
- Diagnosis: Physiological Measurement
 - Is high-resolution anorectal manometry really an advance in clinical measurement?
 - Which technology should we apply: HR-ARM, Defecography or Balloon Expulsion?
- Do experts agree about the assessment of anorectal function?
 - London Classification version 1.0



Clinical Diagnosis of Constipation

- Fewer than 3 bowel movements per week
- Frustrated straining, incomplete evacuation of stool
- Hard stools, stool weight <35g/day
- Slow colonic transit time >72hr



O'Donnell et al, BMJ 1990



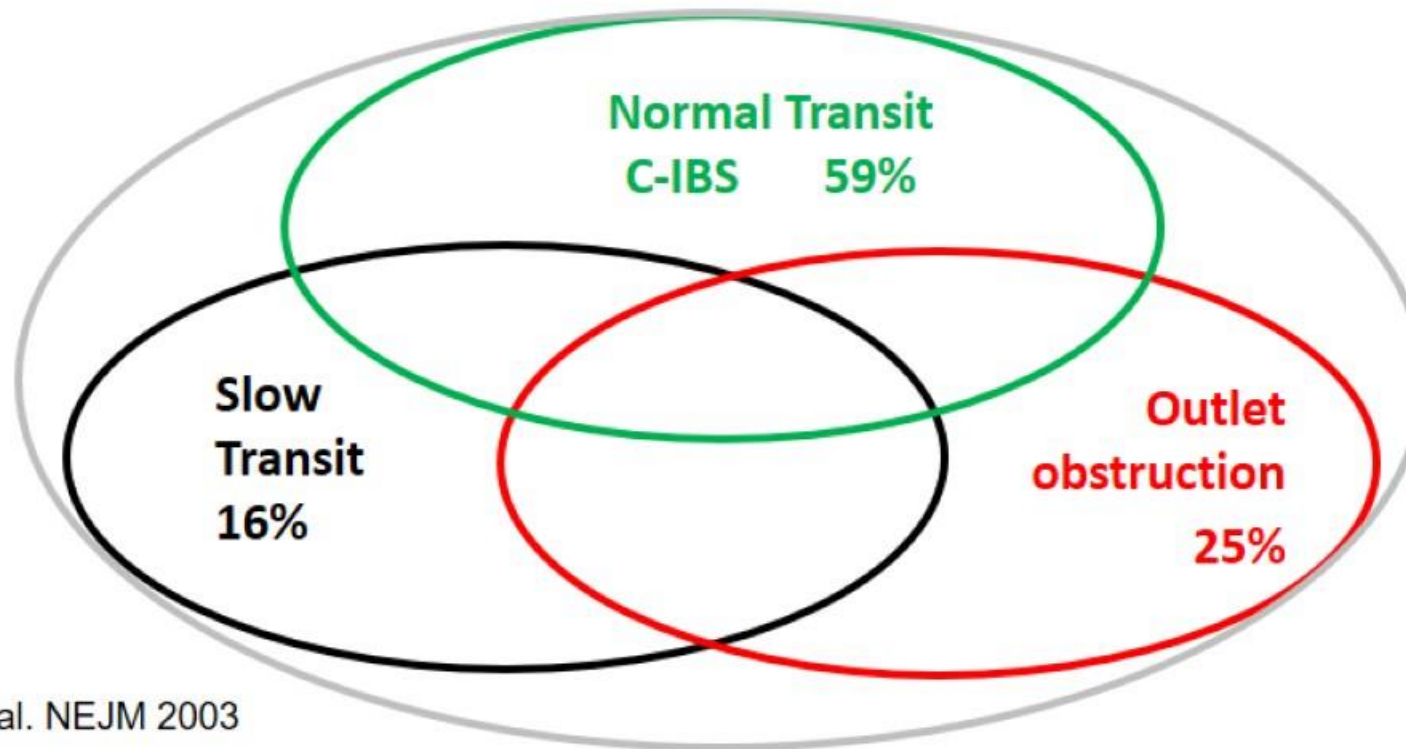
Clinical Diagnosis of Constipation

- Rome definition of chronic constipation includes “normal-transit” and “slow-transit” constipation, and defecatory or rectal evacuation disorders

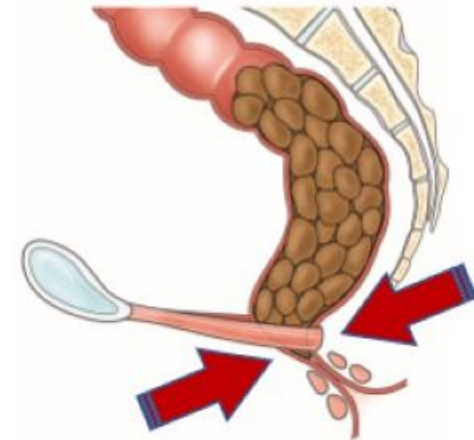
Slow Transit Constipation



Lembo et al. NEJM 2003



Outlet Obstruction



Diagnosis: Conventional Radiology

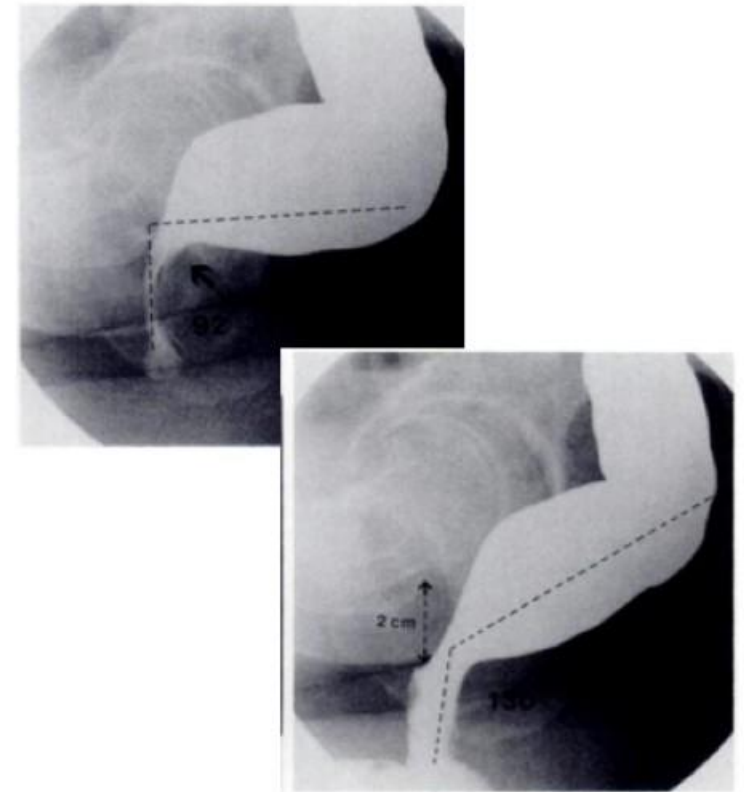
Abdominal XR



Marker Test



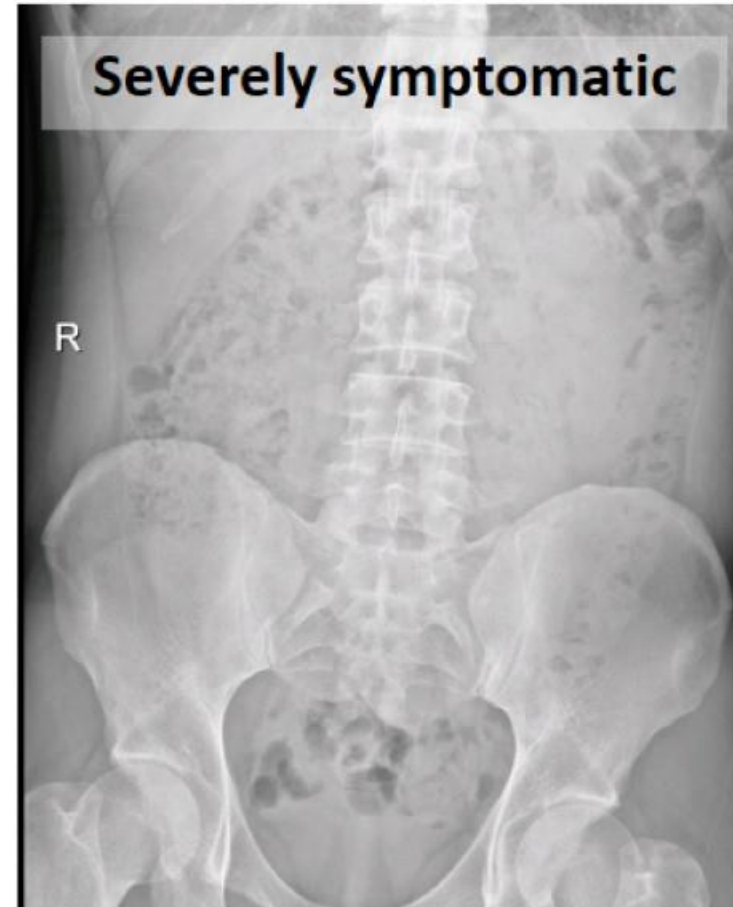
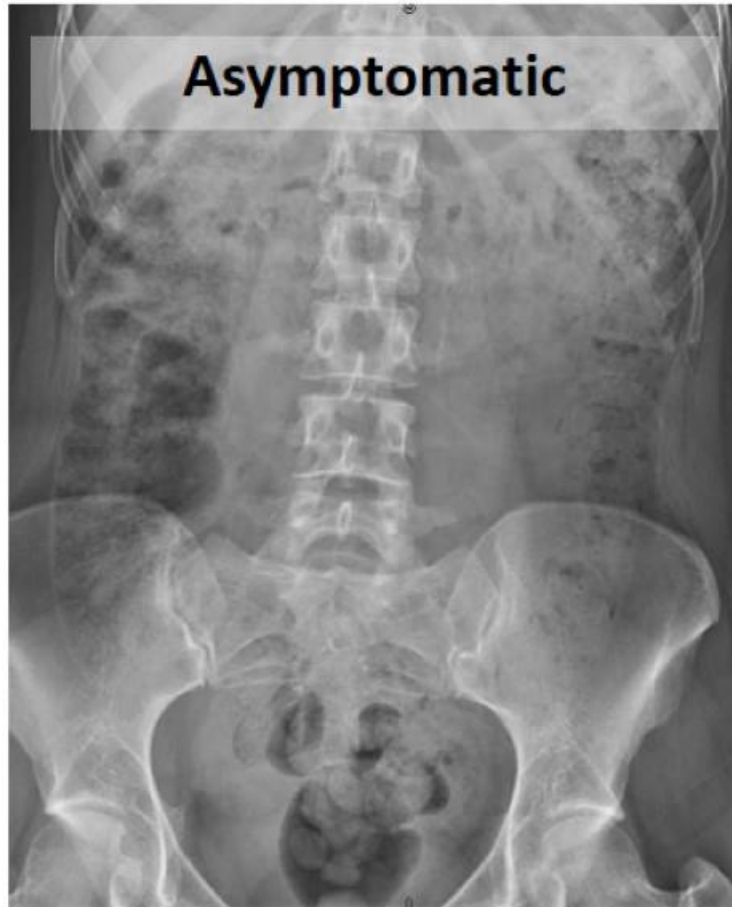
Defecography



Stool is not constipation

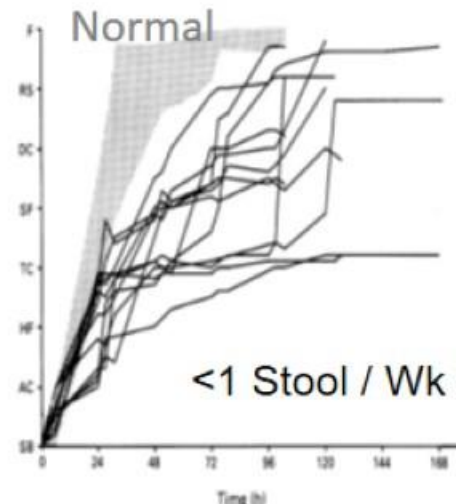


Stool is not constipation



Opaque marker transit studies

- Simple, cheap, well-tolerated and standardised
 - Various protocols and number of markers etc
 - Ideally off laxatives, enemas, suppositories etc
 - Taking capsules on multiple days reduces impact of daily variation in transit and bowel movements
 - Low radiation dose - single AXR



Kamm, Gut 1993

Transit studies



- 48 / 60 (80%) markers remain
- Prolonged transit to all 3 marker sets
- Good evidence of delayed transit time

Summary: Radiology and Transit Studies

- Marker studies provide objective assessment of colorectal transit
 - Correlates with stool consistency
 - *Voluntary* stool retention does not result in “characteristic” pattern
 - Distribution of markers *not* diagnostic of slow transit or disorder of anorectal coordination / dyssynergia

O'Donnell et al. BMJ 1990

Zarate, N., et al. AGJ 2008; 103(2): 427-434.

“Most valuable result may be a negative study!”
- Anton Emmanuel



→
N=30 Patients
Average six consecutive bowel motions

associated with Crohn's disease than steroid treatment, which may lead to complications such as perforation or haemorrhage.

$r = -0.77$

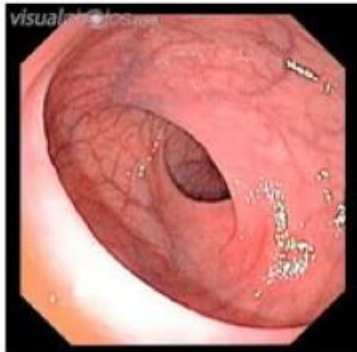
1. Steinberg EE. Oral, esophageal and gastrointestinal Crohn's disease. In: Atlas MN, Kugler MB, Alexander-Williams J, Barkin C, eds. *Inflammatory bowel disease*. Edinburgh: Churchill Livingstone, 1993: 299-306.
2. Fickling JP, Cohen WT. Peptic ulceration in Crohn's disease: regional enteritis. *Gut* 1979;20:998-1000.
3. Tripp GSJ, Laine C, HIR, Haimowitz W, Jansen JMR, Wilson JA. Omeprazole in peptic ulcer: resistant to histamine H₂ receptor antagonists. *Alimentary Pharmacology and Therapeutics* 1993;7:11-8.
4. Woodford K, Greenberg GR. Symptomatic improvement of gastrointestinal Crohn's disease with omeprazole [Abstract]. *Gastroenterology* 1993;96:A551.
5. Wab RP, Gomes MDFA, Wood EC, Lopez LH, Ponder RE. Effect of daily and omeprazole on 24-hour intragastric acidity. *Am J Med* 1993;95:12-4.

(Accepted 28 November 1999)

times the number of markers in the abdomen and regional transit time as 1-2 times the number of markers in the region.' In one patient with slow transit radiography was repeated on the sixth morning.

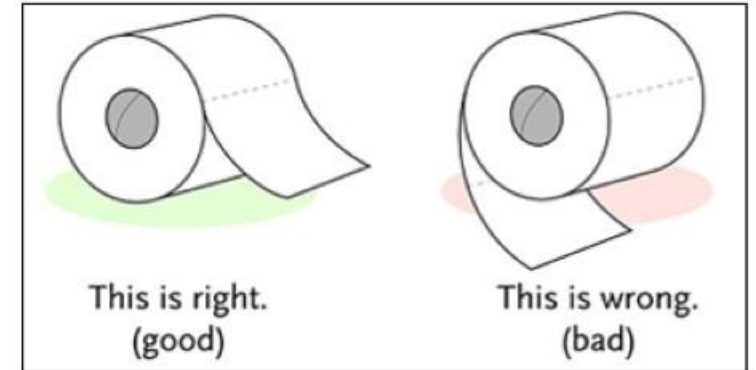
Diagnosis: Endoscopy

- Endoscopy is essential to exclude cancer, structural changes (e.g. prolaps), and mucosal damage, etc.
- Majority of investigations normal and do **not** explain patient's symptoms
- Standard tests not adequate to assess gastrointestinal motility and function
 - *would you examine the heart at rest? .. or the knee without moving it ?*
 - *investigations of GI motility and function are required!*



FIND THE CAUSE !

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 - London Classification version 1.0



Diagnostic Accuracy of HR-ARM for diagnosis of dyssynergic defecation

- 170 subjects
 - 85 healthy volunteers (HV)
 - 85 patients with constipation (FC)
- Analysis of 'push' manoeuvre blinded to subject status
- Variable agreement based on pressure measurements extracted from data

Line-plot patterns	All (N=170)	HV (N=85)	FC (N=85)	p Value
Abnormal	154 (91)	74 (87)	80 (94)	0.19
Type I dyssynergia	48 (28)	31 (37)	17 (20)	0.03
Type II dyssynergia	11 (6)	7 (8)	4 (5)	0.53
Type III dyssynergia	27 (16)	13 (15)	14 (17)	1
Type IV dyssynergia	56 (33)	17 (20)	39 (46)	0.001*
Unclassified	12 (7)	6 (7)	6 (7)	1
Types I–IV (FAR)	142 (84)	68 (80)	74 (87)	0.30
Types II+IV (FDD)	67 (39)	24 (28)	43 (51)	0.005†

Negative finding !
ONLY change in anal
pressure during simulated
defecation assessed

Diagnostic Accuracy of HR-ARM for diagnosis of dyssynergic defecation

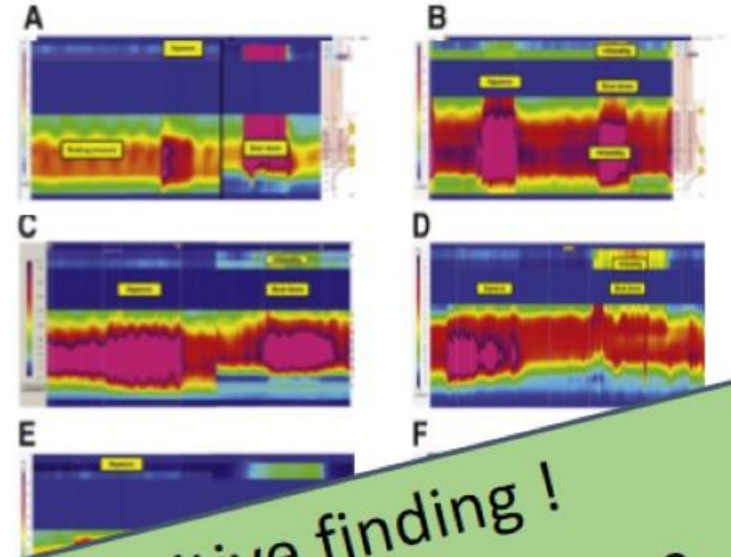
Serial diagnostic study in 193 consecutive patients with symptoms of obstructive defecation

- HR-ARM analyzed by 3 blinded observers
 - inter-agreement, kappa 0.67
- High level of diagnostic agreement with Magnetic Resonance (MR) Defecography (reference standard) – overall accuracy 82%
 - Excellent for paradoxical contraction
 - Highly specific (but not sensitive) for anal intussusception

Supports use of AR-HRM as first line test

- (MR-) Defecography if disorder of anorectal coordination / dyssynergia is not obvious

Heinrich et al.; Clin Gastroenterol Hepatol **13**(7): 1310-1317



Positive finding !
Change in anal pressure
during squeeze and
simulated defecation
compared

Tests of Evacuation:

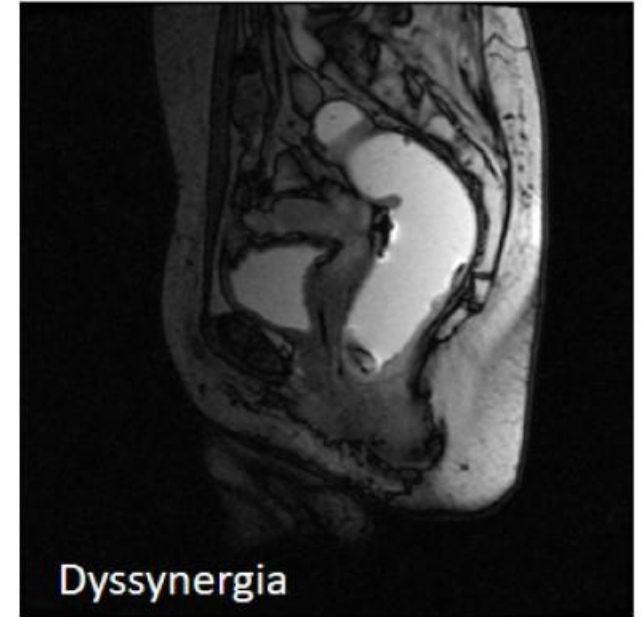
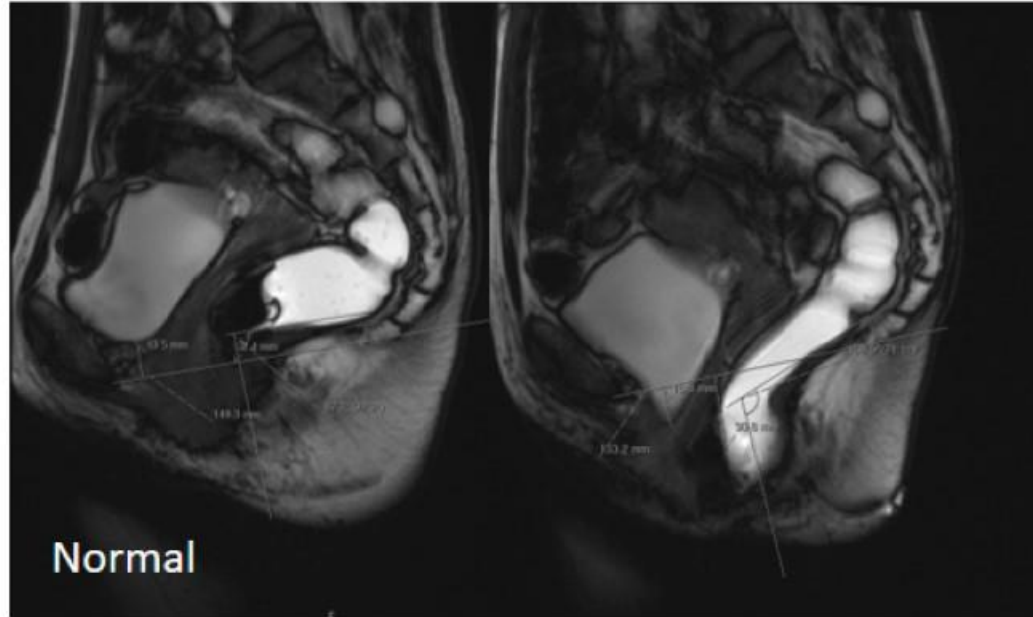


- Rectal Balloon Expulsion Test (BET)
 - Exercise stress test for the rectum!
 - Simple, safe and cheap
 - Normal < 1 Minute for successful expulsion (< 2 Minute definitively pathologic)



Mit Erlaubnis der Autorin
Jill Enders «Darm mit Charme»

Tests of Evacuation: MR Defecography

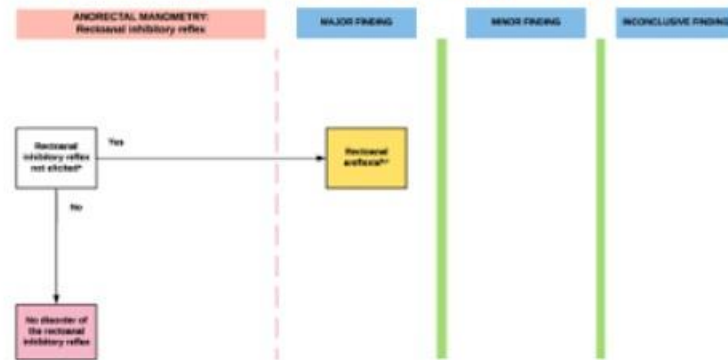


- Structural outlet obstruction: reference standard diagnostic technique
- Functional outlet obstruction / Dyssynergia: Can be very challenging
 - Significant overlap with normal, healthy volunteers
 - Traditional parameters derived from barium literature (e.g. 2/3 evacuation within 1-minute) may not translate to MRI
 - Subjective measures e.g. paradoxical contraction, closed anal canal – common in so-called “situational embarrassment”

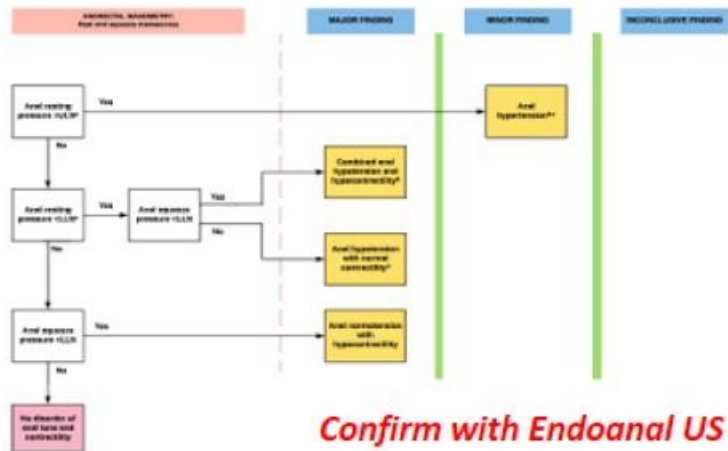
London Classification of anorectal disorders

Diagnostic Classification version 1.0

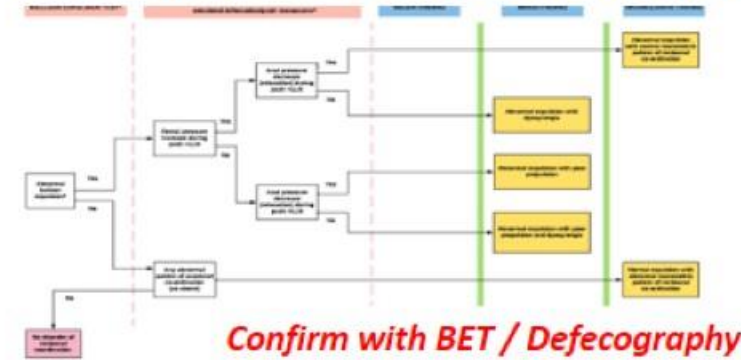
I: DISORDER OF RECTOANAL INHIBITORY REFLEX



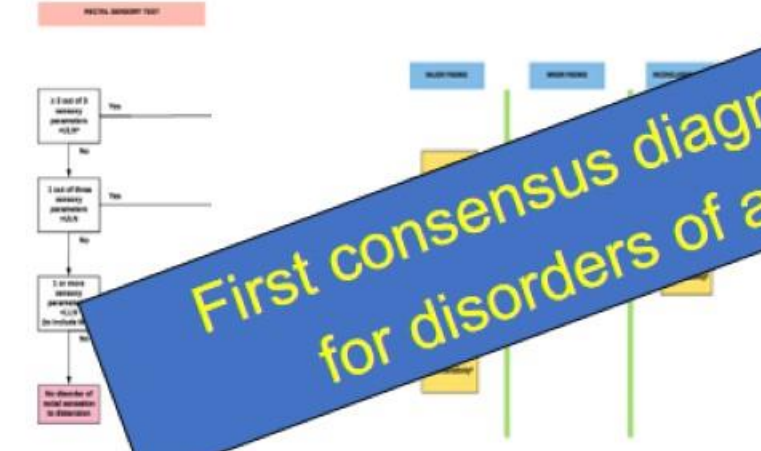
II: DISORDER OF TONE AND CONTRACTILITY



III: DISORDER OF RECTO-ANAL COORDINATION



IV: DISORDER OF RECTAL SENSATION



First consensus diagnostic classification for disorders of anorectal function

Received: 20 February 2019 | Revised: 22 October 2019 | Accepted: 15 March 2020
DOI: 10.1111/ana.15479

POSITION PAPER

The international anorectal manometry working group (IAPWG) recommendations: Standardized protocol and the London classification for disorders of anorectal function

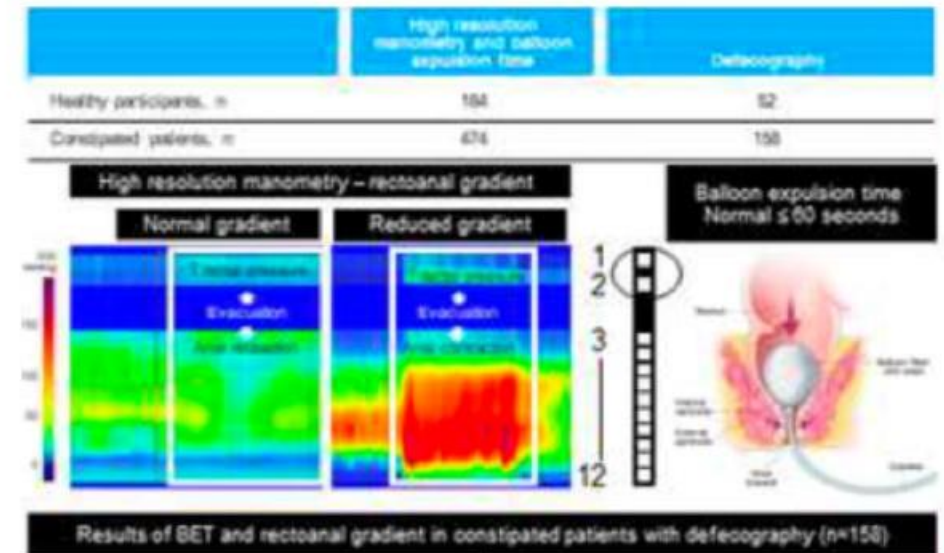
Emma V. Carrington¹ | Henriette H. S. Mark Scott¹ | All members of the International Anorectal Manometry Working Group

Knowles¹ | Mark Fox² |

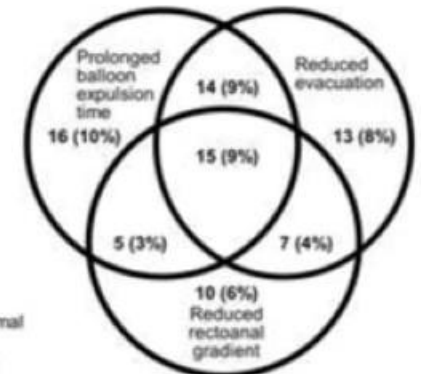
WILEY

London Classification of anorectal disorders: Validation

- Comparison of HR-ARM, Rectal Balloon Expulsion Test, and Defecography
- 474 constipated patients underwent HR-ARM and BET; 158 underwent defecography.
- HR-ARM, BET, and defecography findings were concordant for constipated patients,
- Prolonged BET, reduced gradient, and incomplete evacuation each independently support diagnosis of dyssynergic defecation disorder (DD) in constipated patients.
- **Results confirm that patients with**
 - abnormal HR-ARM *or* BET = “probable DD”
 - abnormal results in *both* tests = “definite DD”



**HOT OFF
THE
PRESS**



Blackett... Bharucha, et al.;
Gastroenterology 2022; article in press

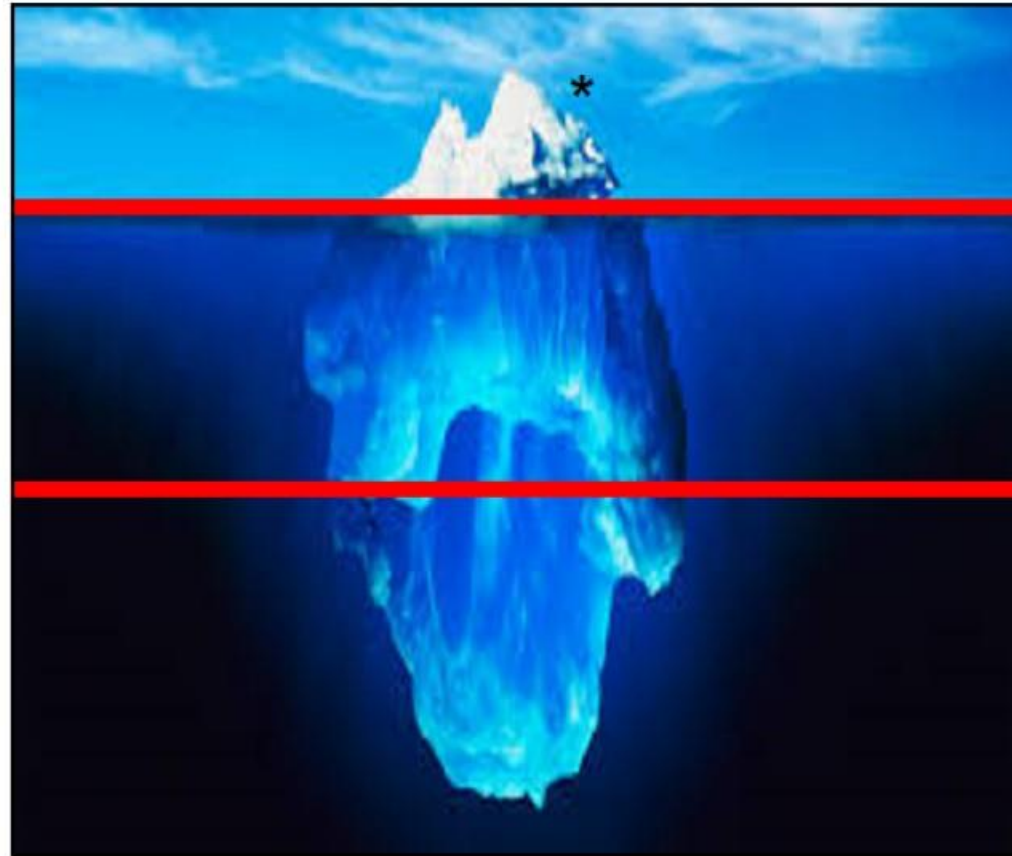
All normal
n=78
(49%)

How to help your obstructed patient – TREAT !

0.4% ²

1.4%-3% ^{1,2}

14% ¹

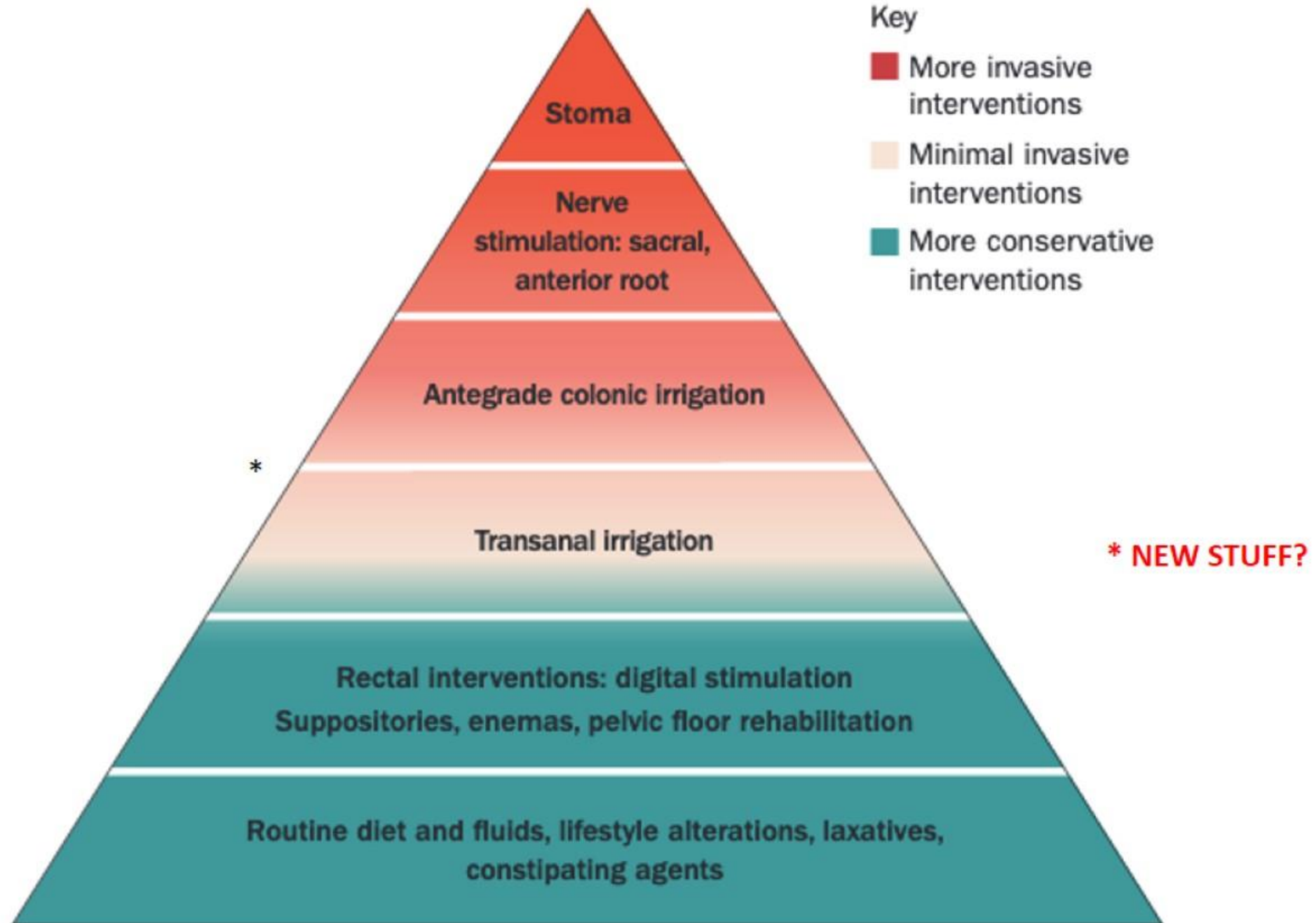


- Medically managed
- Chronic duration > 6 months
- Failure 2 laxatives

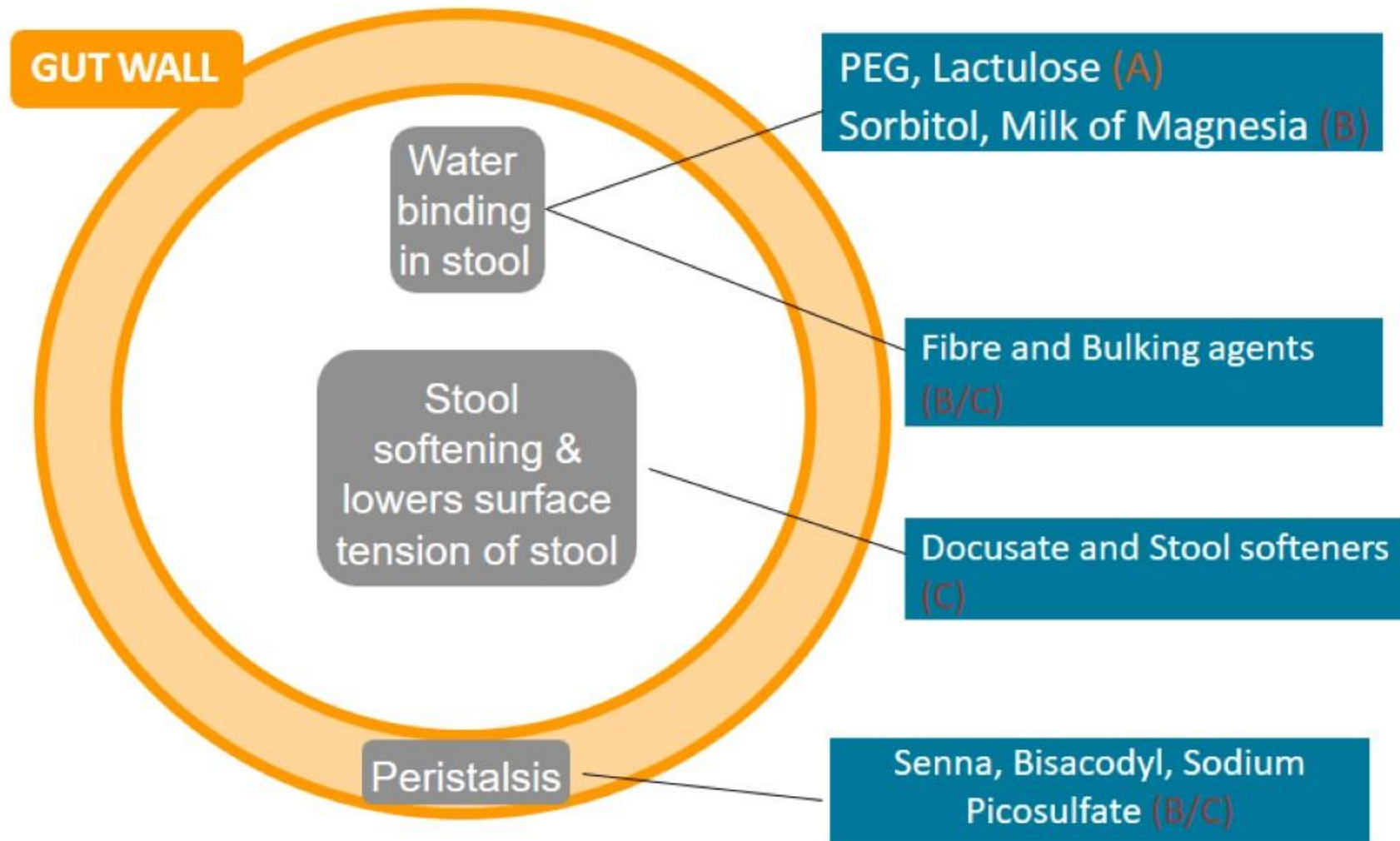
Primary care

1. Suares NC, Ford AC. *Am J Gastroenterol* 2011

2. Shafe et al. *Therap Adv Gastroenterol* 2011



Conservative Management CC



Rao et al. Nature Reviews 2016

Tack & Müller-Lissner. Clin Gastroenterol Hepatol 2009

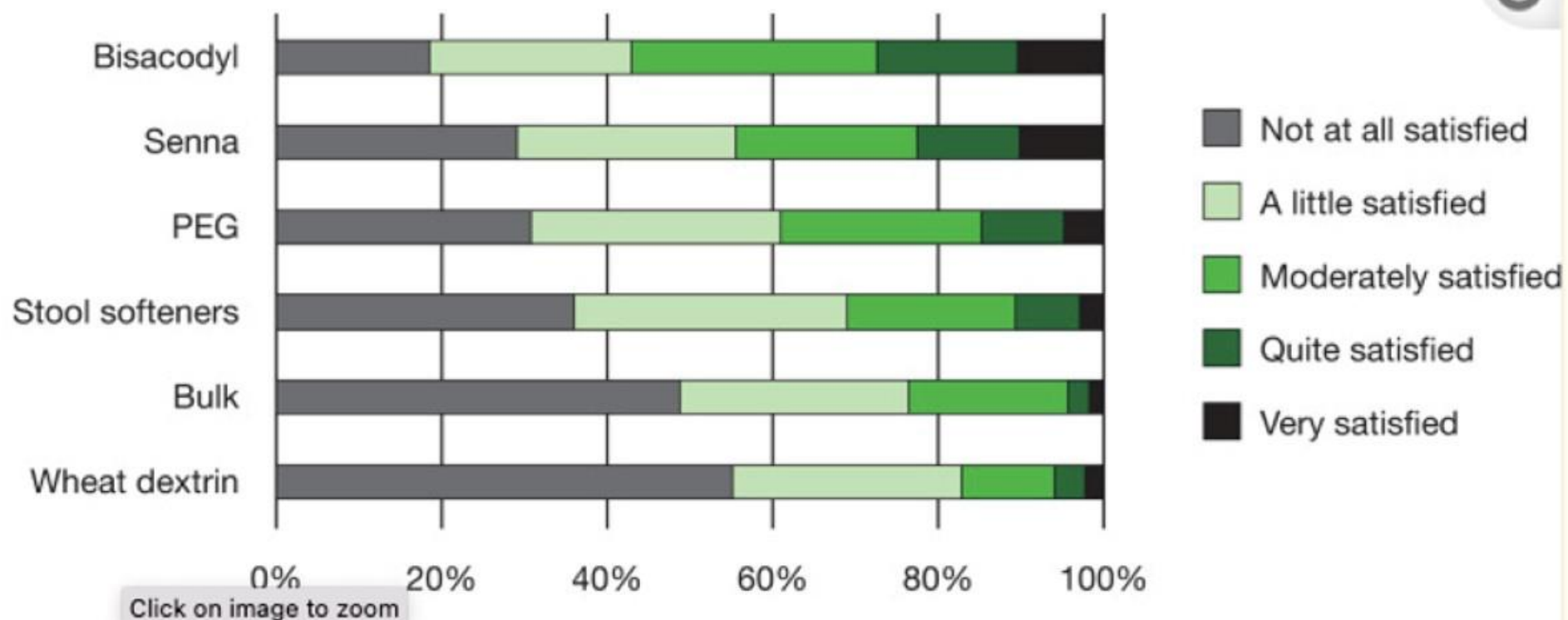
What have we got ?

Treatment, frequency	Dose	NNT (95% CI) for CC and IBS-C	Cost per month (2018 US \$)	Comments
MUCILAR METAMUCIL NORMACOL	CC: Variable dose IBS-C: Variable dose	CC: 2 (1-3) ⁷⁹ IBS-C: 10 (6-33) ⁷⁹	8.34	Start with low dose and increase gradually
MACROGOL MOVICOL	CC: 17 g IBS-C: NA	CC: 3 (2-4) ² IBS-C: NA	8.73	More evidence in CC than IBS-C. Improved bowel symptoms but not abdominal pain in IBS-C ⁸⁰
IMPORTAL γ	20 g	NA	13.28	Can produce bloating and distention
LAXOBERON	CC: 10 mg IBS-C: NA	CC: 4 (NA) ⁸¹ IBS-C: NA	5.17	Available as suppository, preferably administered 30 min after breakfast
AGIOLAX	17.2-34.4 mg	NA	6.96	Widely used anthraquinone laxative

Are we doing well?

1423 patients

a) Constipation



New Therapies

Drug	Primary Outcome	Efficacy: NNT (95% CI)	Adverse Effects NNH (95% CI)	Cost/ mo
Intestinal secretagogues				
Linaclootide ²⁷	Increase in CSBM >1/wk and ≥3 CSBM/wk for at least 75% of weeks in a 12 wk trial	72 µg 12 (6–29) 145 µg 10 (6–19)	72 µg 9 (6–18) 145 µg 9 (6–13) <i>Diarrhea</i>	\$423
Lubiprostone ²⁶	≥3–4 SBM/wk	24 µg 4 (3–7)	4 (3–7) <i>Total AEs</i>	\$288
Plecanatide ²⁷	Increase in CSBM >1/wk and ≥3 CSBM/wk for at least 75% of weeks and response in 3 of last 4 wk of trial	3mg 11 (8–19) 6mg 12 (8–23)	27 (11–89) 27 (13–72) <i>Diarrhea%</i>	\$416
5HT4 agonists				
Prucalopride ²⁶	≥3 CSBM/wk	6 (5–9)	10 (6–29) <i>Total AEs</i>	\$428

A new hope ?

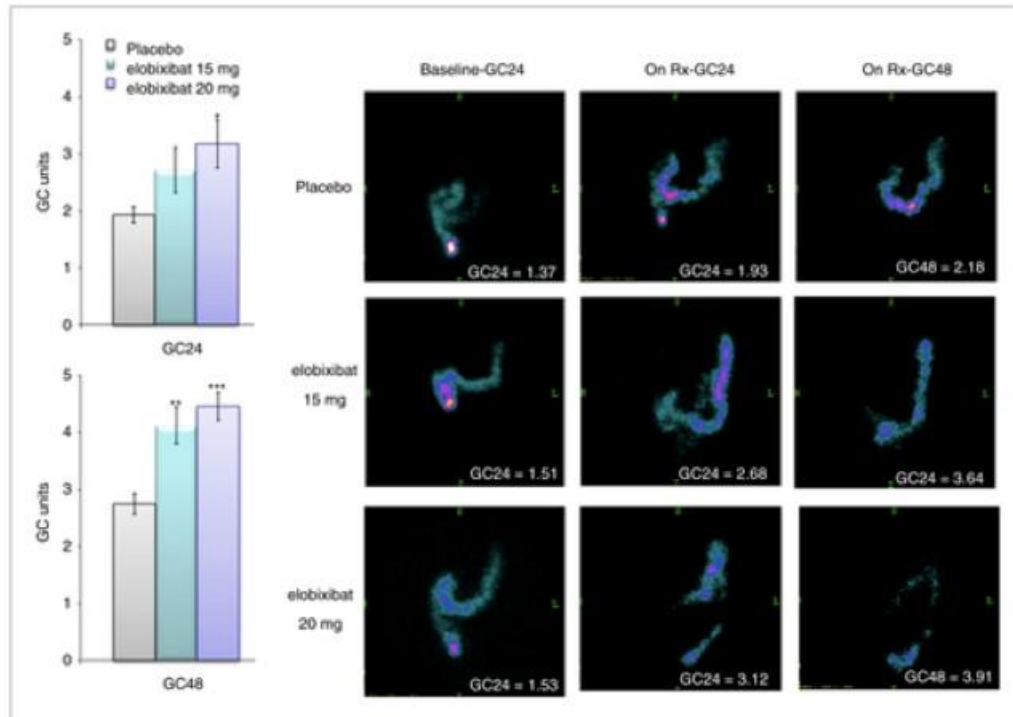


FIGURE 1

[Open in figure viewer](#) | [Download PowerPoint](#)

Dose-related effects of elobixibat on colonic transit in female patients with functional constipation. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

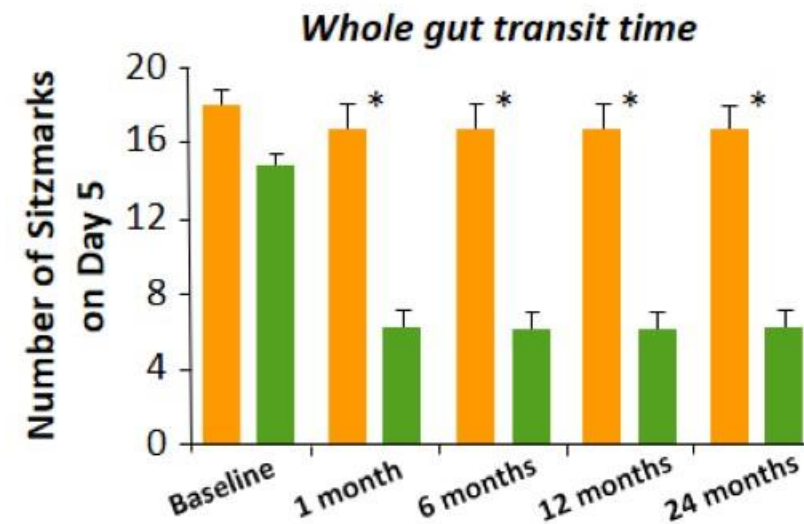
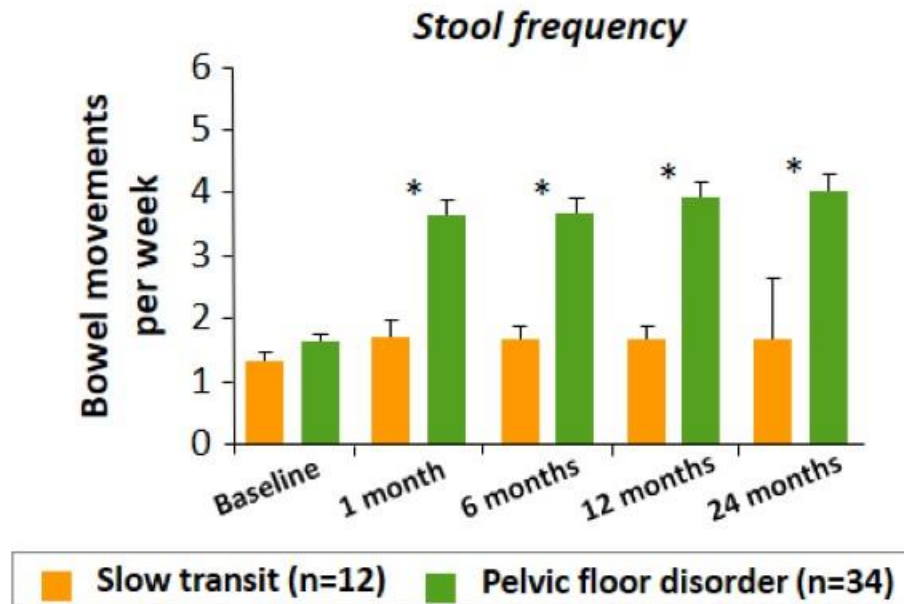
Bile acid transport inhibitor
Elobixibat

- Side effects abdominal pain, diarrhea
- Not yet approved in Switzerland

Biofeedback therapy

Evidence

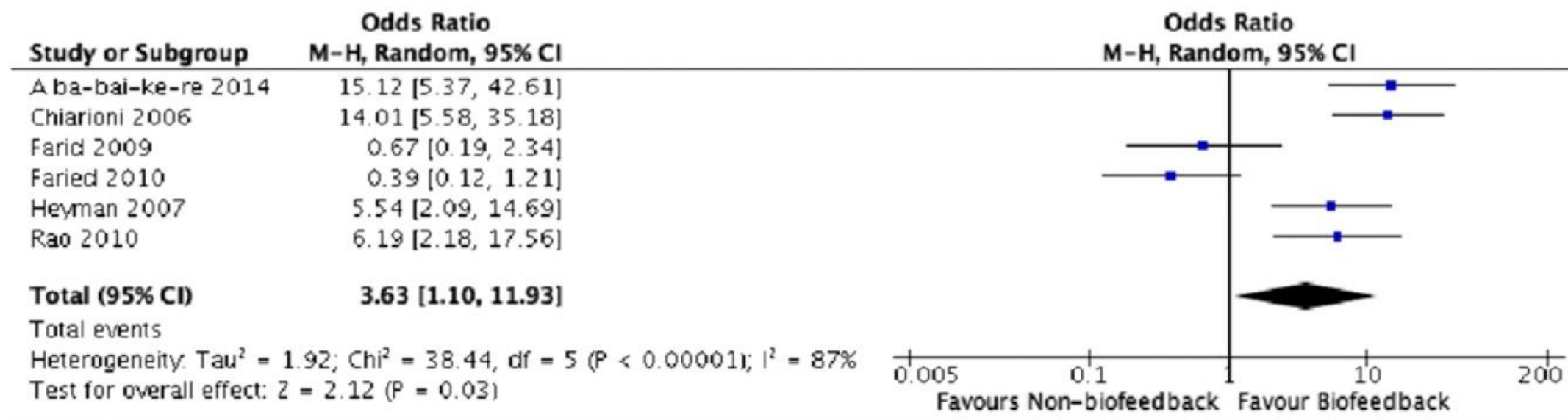
- Large amount of short- and long-term data from RCTs for biofeedback as an effective treatment for chronic constipation¹⁻⁵
- Greatest effect in patients with pelvic floor dyssynergia:⁵



*For each follow-up interval, $P < 0.001$

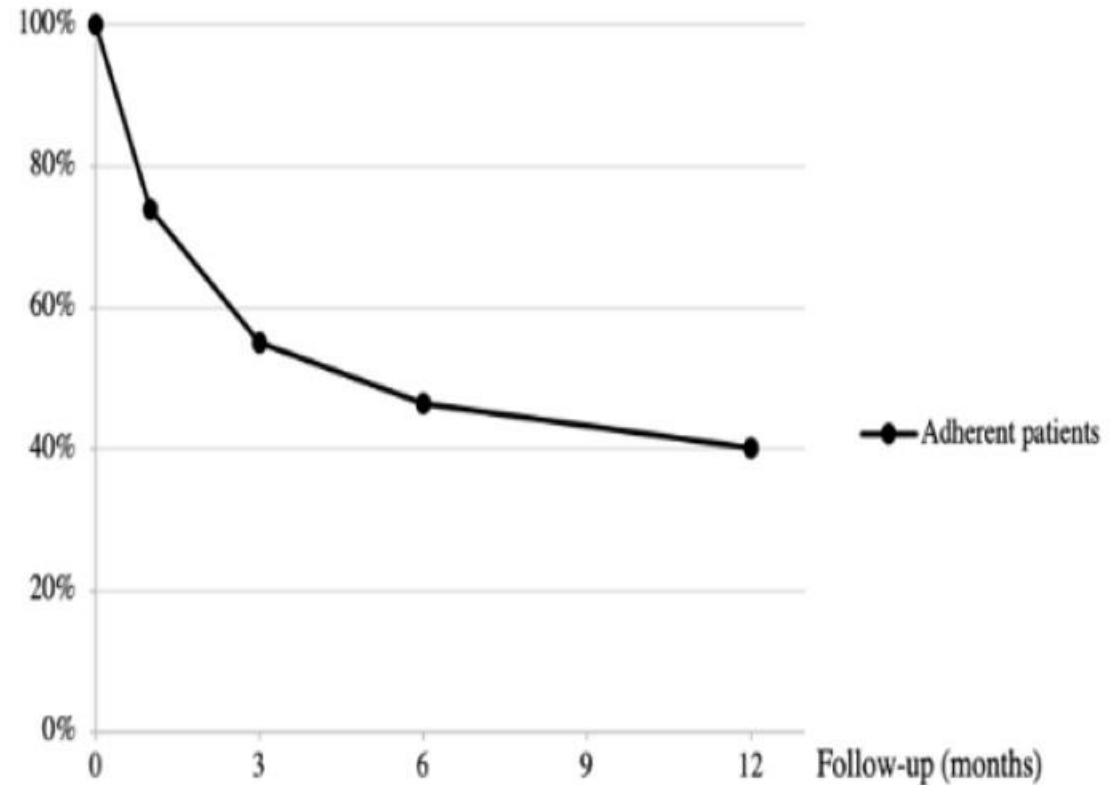
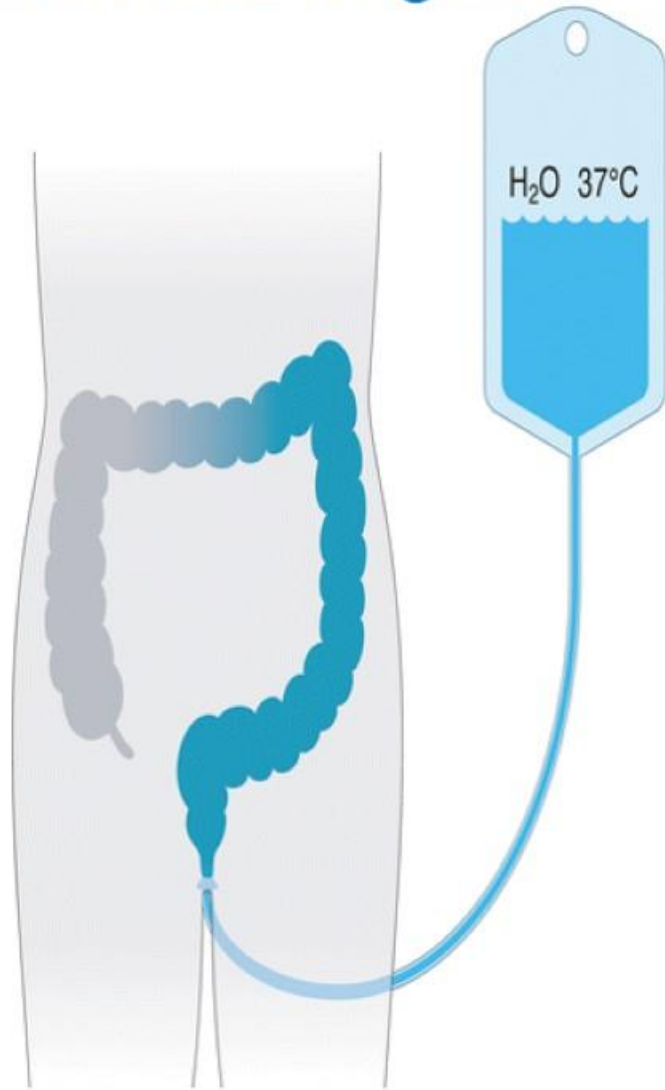
1. Rao. *Gastroenterol Clin North Am.* 2008;37(3):569-86
2. Rao et al. *Clin Gastroenterol Hepatol.* 2007;5(3):331-8
3. Rao et al. *Am J Gastroenterol.* 2010;105(4):890-6
4. Gadel Hak et al. *Arab J Gastroenterol.* 2011;12(1):15-9
5. Chiarioni et al. *Gastroenterology.* 2005;129(1):86-97

Biofeedback in DD – Success?



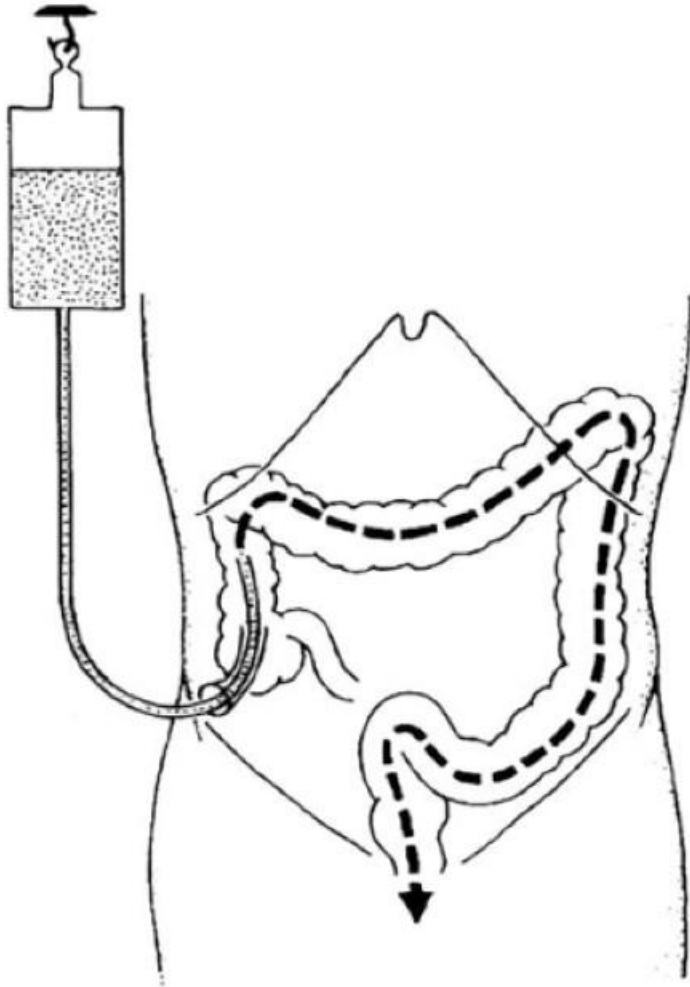
More effective than polyethylene glycol, sham feedback, or diazepam!

Transanal irrigation – an overlooked option



Christensen et al Tech Coloproctol 2017
Chesnel et al Tech Coloproct 2021
Igebdioh et al Brit J Nurs 2022

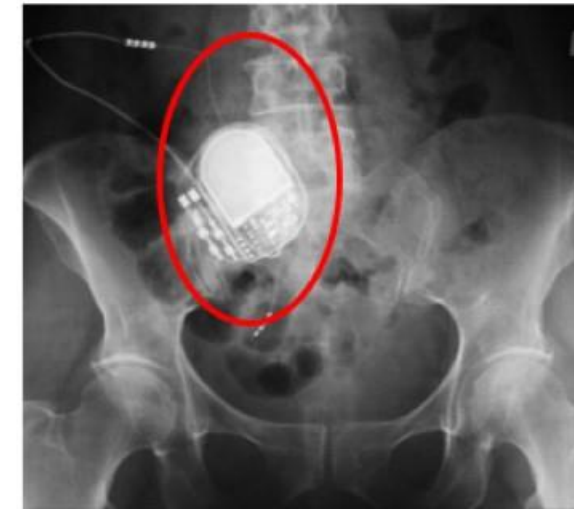
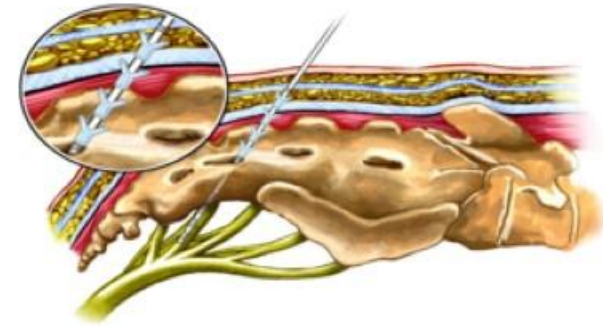
ACE Stoma ?



- Pediatric use with high success rate
- In adults deminishing success rate 47% (revision, colectomie

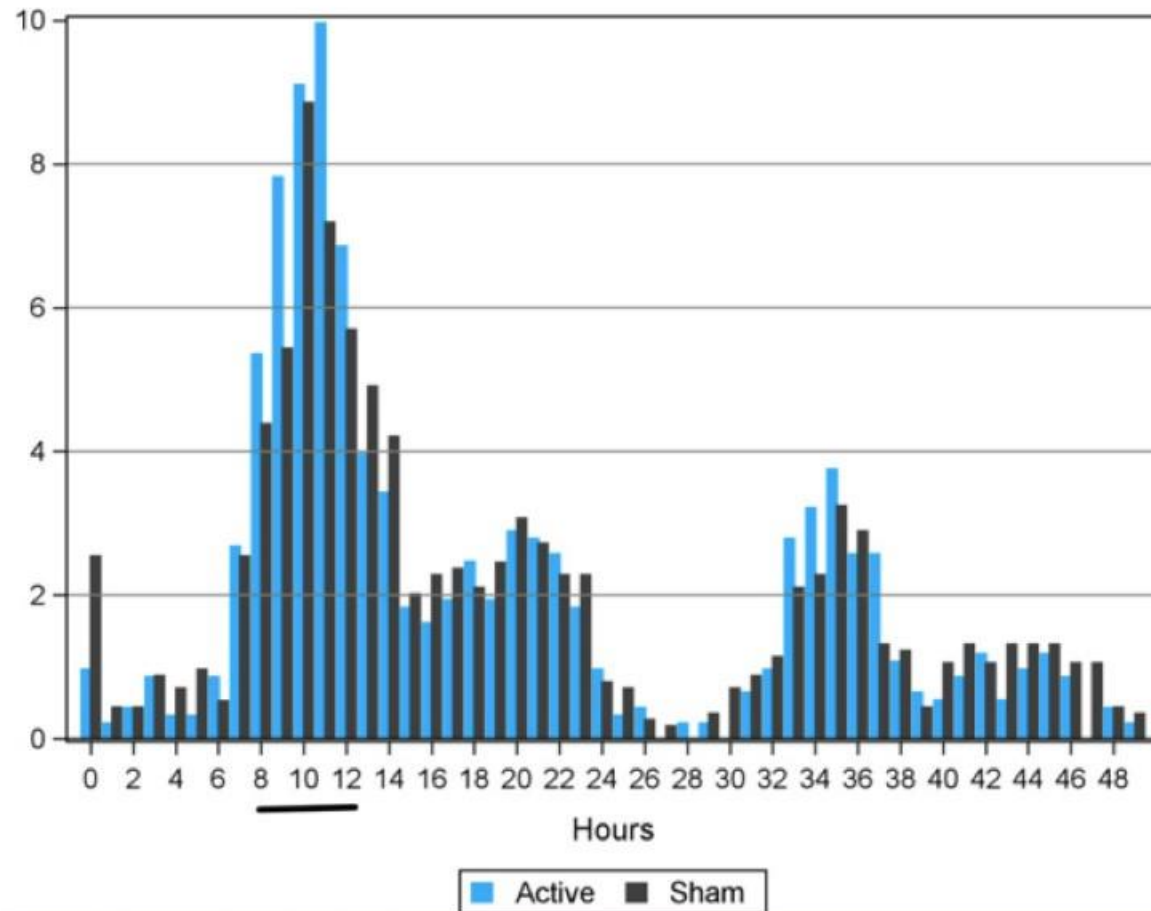
SNS ???

- Bipolare Electrodes Implantation sacral nerves S3-S4.
- Low amplitude , low frequency stimulation,
- Effective in FI
- Data in Constipation lacking !
- No effect on GI Transit / Evacuation



Disorder	Effectiveness	References
Faecal incontinence	54-63%	Thin et al, 2013
Slow transit constipation	87%	Kamm et al, 2010
Rectal evacuatory dysfunction	???	????

Make it move ?!



250 pt enroled

Within 3 hours of vibration, there were significantly more % CSBMs in the active vs. sham group (50% vs. 42%; $P = .0018$)

In study 2, there were two CSBM peaks associated with vibration sessions.

Energy!?

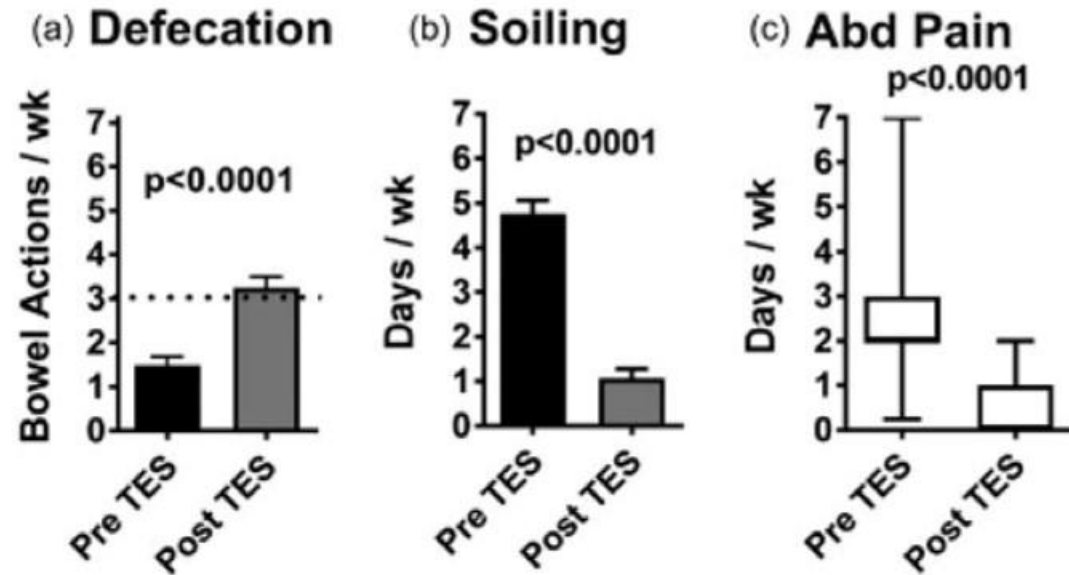


Figure 1. a. Defecation frequency, b. soiling frequency, and c. abdominal pain in children with STC before and after transcutaneous electrical stimulation (TES). wk = week, a and b: mean and standard error of mean, $n = 62$, paired t -test. c: median and quantiles, $n = 39$, Wilcoxin-paired signed rank test.

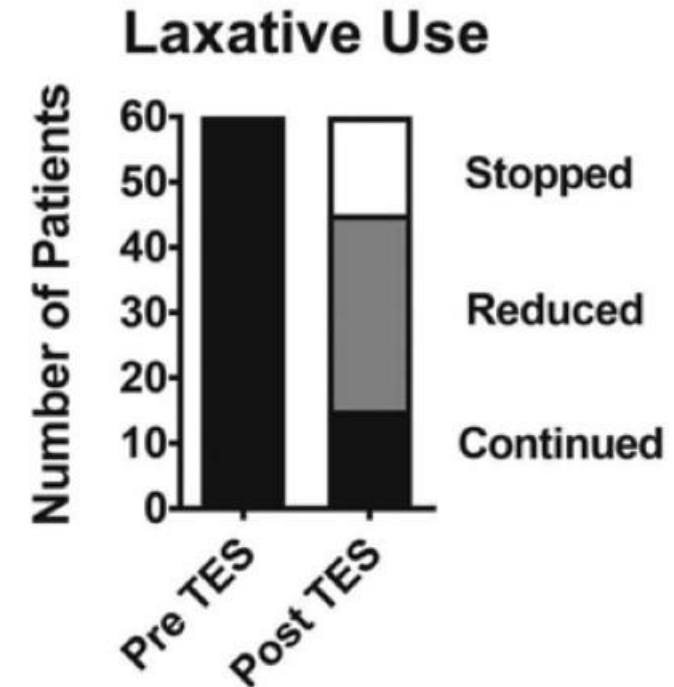
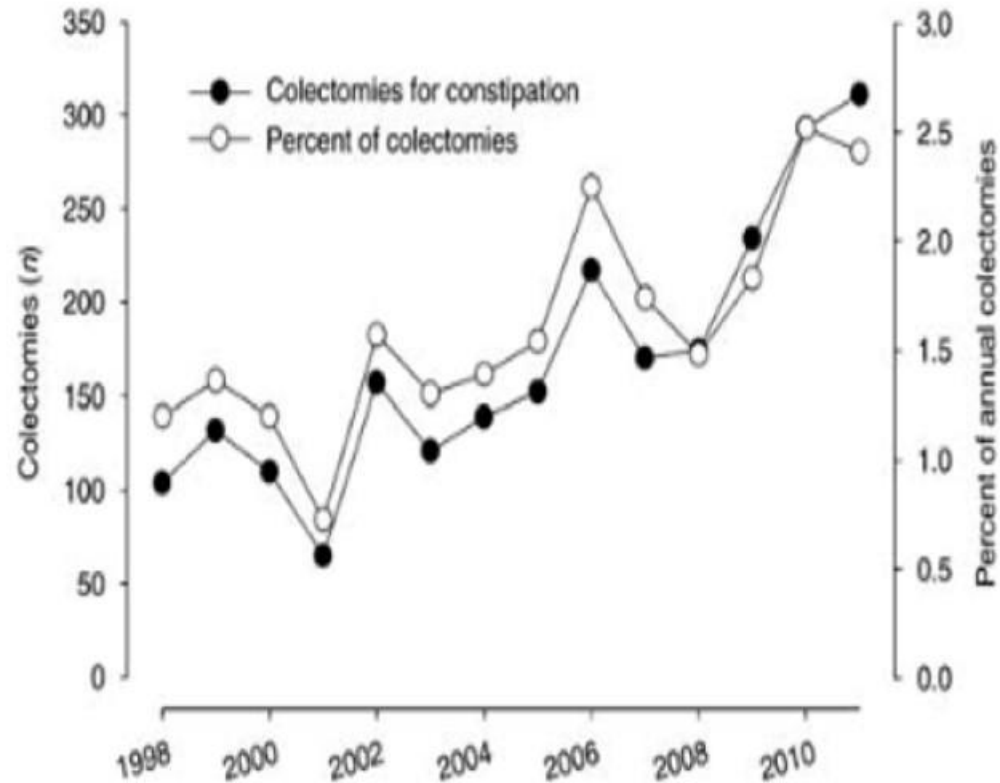


Figure 3. Laxative use in children with STC before and after TES. $N = 60$. Two children had stopped laxatives before start of TES.

Colectomy in CC: when and why

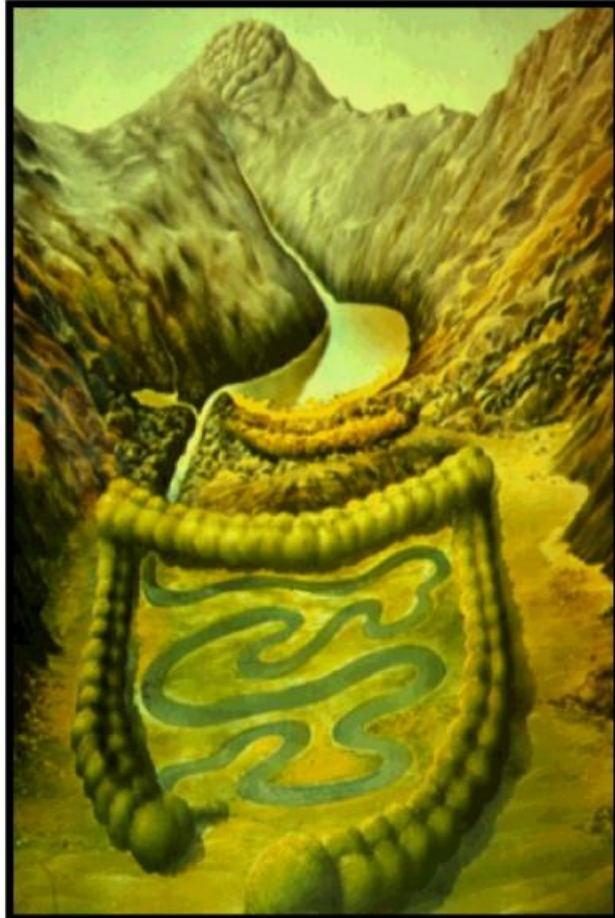


- Prolonged failure of medical / mechanical therapy
- Rule out other motility disorders
- Reduced Quality of life
- Psychological evaluation and continued support necessary
- Patient satisfaction after colectomy 39-100%
- Pain and Bloating do not improve !!!
- Rule out IBS before Colectomy

Pitfalls in Constipation – back to basics !!!

- Considering the diagnosis of refractory CC too early !!
- Incomplete assessment for rectal evacuation disorder (RED)
 - Inadequatedigital rectal exam(DRE)
 - “Normal” results on anorectalmanometry
 - No testing for structural pathology
- Incomplete drug history
 - Tylenol PM(diphenhydramine), Antiallergymedications, Antacids (Tums, Maalox,Gaviscon), Herbals (peppermint oil), 5HT3 antagonists (ondansetron), Promethazine, THC preparations(dronabinol)
- Inadequate assessment for systemic disease

Thank you for your attention !



“A good set of bowels is worth more to a
man
than any amount of brains”

Josh Billings (Henry Wheeler Shaw) 1818-1885