

Intractable Constipation: What is next when you are stuck

Jose M Garza MD, MS

Gi Care for Kids

Medical Director Neurogastroenterology and Motility
Children's Healthcare of Atlanta



Nothing to disclose



Colon

- Reabsorbing water and electrolytes
- Serves as temporary storage
- Prominent mixing pattern



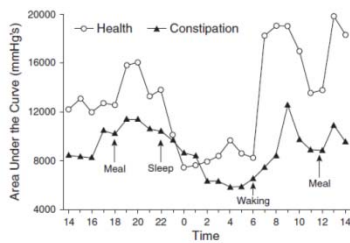
Colonic motor activity can be divided into:

- Segmental (single contractions or bursts)
- Propagated activity
 - Low Amplitude Propagated Contractions (LAPC)
 - **High Amplitude Propagated Contractions (HAPC)**
 - Periodic Rectal Motor Activity (PRMA)

Segmental (single contractions or bursts)

- Accounts for most of the colonic activity
- Waves from **5 to 50mmHg**
- Slow down colonic transit **allowing optimal absorption** of contents and propulsion of fecal contents over short distances

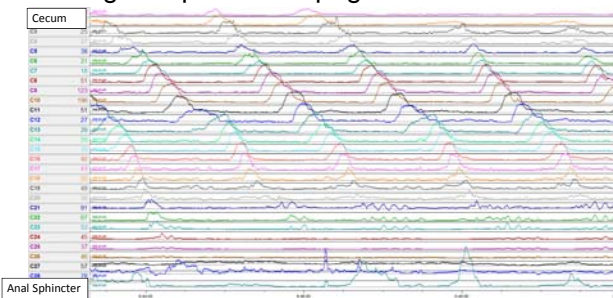




Propagated activity

- LAPC (< 50mmHg)
 - Seem to be associated with passage of flatus and involved in the transport of colonic fluid contents
- HAPC (> 80mmHg)
 - Usual mean amplitudes of 150mmHg migrating across **at least 30cm for >10sec**
 - **Accounts for transport of colonic contents over large portion of colon**
 - Occur about 4 to 10x per day mostly after meal, upon awakening and may be accompanied by an urge to defecate or borborygmi and precede defecation

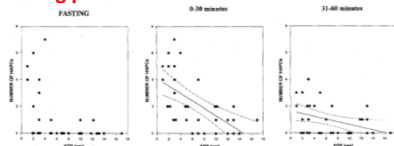
High Amplitude Propagated Contractions



Age-related changes in colon motility

Carlo Di Lorenzo, MD, Alejandro F. Flores, MD, and Paul E. Hyman, MD
from the Department of Pediatrics, Harbor-University of California at Los Angeles Medical
Center, Martin Luther King, Jr., General Hospital, and Charles Drew University of Medicine
and Science, Los Angeles, and Newton-Wellesley Hospital, Newton, Massachusetts

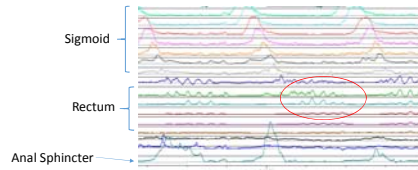
**HAPCs decrease in number and segmental contractions
increase during postnatal maturation of colonic manometry**



- The rectum has a unique motility pattern:

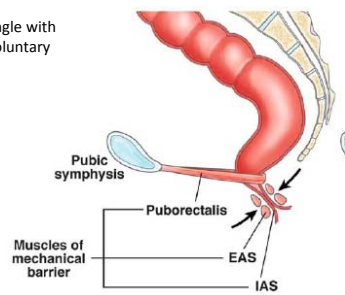
Periodic Rectal Motor Activity

- Discrete bursts of phasic and tonic pressure waves with frequency of >3/minute
- Can migrate retrograde at night and serve as an intrinsic nocturnal brake



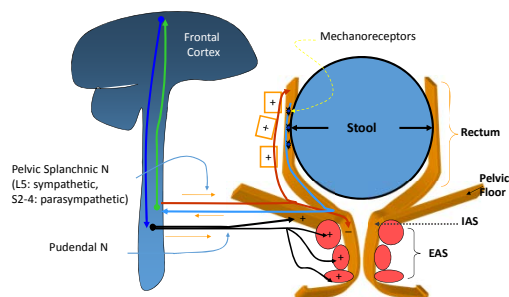
The anal canal forms a 90-degree angle with the axis of the rectum and during voluntary squeeze it becomes more acute

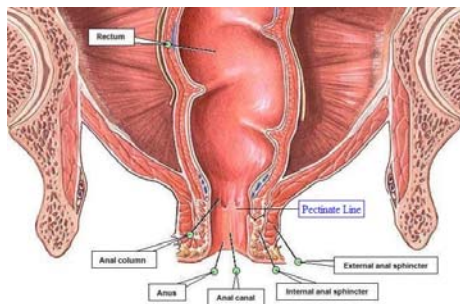
IAS: 70% to 85% of the resting sphincter pressure primarily responsible for maintaining anal continence at rest



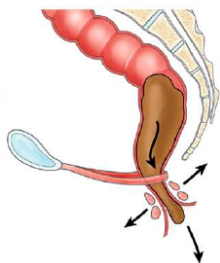
Schey R, et al. Am J of Gastroenterol 2012

Hindgut Motility: Function





Normal defecation



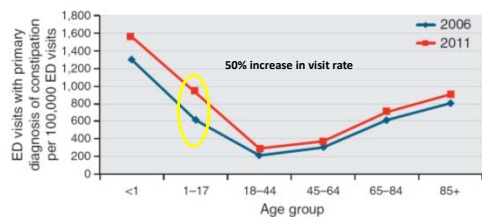
- Sensory perception of stool
- Rectal distension
- Contract diaphragm, abdomen, and rectal muscles
- Relax EAS (decreased sphincter pressure)
- Relax puborectalis muscle

Schey R, et al. Am J of Gastroenterol 2012

Constipation beyond infancy...

- Common problem in children
- 3-10% visits to general pediatric clinics
- 25% referrals to peds GI
- Worldwide prevalence 0.7% to 29.6%
- Peak incidence time of toilet training

- Mean cost per patient rose by 56% (\$1,474 to \$2,306)
- Aggregate national cost increased by 121%



Sommers et al, Am J Gastroenterol 2015

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JPGN, Journal of Pediatric Gastroenterology and Nutrition Publish Ahead of Print
DOI: 10.1097/JPG.0000000000000000

Pediatric Functional Constipation Gastrointestinal Symptom Profile Compared to Healthy Controls

James W. Yarnik, PhD, Samuel Yarnik, MD, Robert J. Mulliken, MD, Michael M. Bink, PhD, Miguel Angel, MD, Christine R. Bink, PhD, Christine Yang, PhD, PhD John F. Pohl, MD
MD for the Pediatric Quality of Life Inventory Gastrointestinal Symptom Module Young Study Consortium

¹Department of Pediatrics, College of Medicine, Department of Landscape Architecture and Urban Planning, College of Architecture, Texas A&M University, College Station, TX

²Center for Healthy and Functional Gastrointestinal Disorders, Boston Children's Hospital, Harvard Medical School, Boston, MA

³Department of Pediatrics, Baylor College of Medicine, Children's Nutrition Research Center, Texas Children's Hospital, Houston, TX

⁴Department of Pediatrics and Pediatrics, Baylor College of Medicine, Texas Children's Hospital, Houston, TX

⁵Department of Epidemiology, Biostatistics and Nutrition, Lurie Children's Hospital of Chicago, Northwestern University Feinberg School of Medicine, Chicago, IL

⁶Department of Pediatric Dentistry and Orthodontics, Faculty of Dentistry, Federal University of Minas Gerais, Belo Horizonte, MG, Brazil

⁷Department of Psychology, Texas A&M University, College Station, TX

Pediatric patients with **functional constipation** reported a broad gastrointestinal symptom profile in **comparison to uniquely matched healthy controls**

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What is the definition of constipation?

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Rome III criteria: functional Constipation

- 2 or more of the following in a child with a developmental age of at least 4 years with insufficient criteria for diagnosis of IBS:

- Two or fewer defecations in the toilet per week
- At least one episode of fecal incontinence per week
- 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 which may obstruct the toilet



A thorough history and complete physical examination are usually adequate to accurately diagnose functional constipation



- PEG 3350



I have tried miralax, lactulose and Milk of Mag
.....Why is it NOT working ?

CLINICAL GUIDELINE

CME

Evaluation and Treatment of Functional Constipation in
Infants and Children: Evidence-Based Recommendations
From ESPGHAN and NASPGHAN

M.M. Tabbers, C. Di Lorenzo, M.Y. Berger, C. Faure, M.W. Langendam, S. Nurko,
A. Stuijls, Y. Vandenplas, and M.A. Benninga

(JPGN 2014;58: 258–274)



- **Complete bowel evacuation is the first step:**
 - High dose polyethylene glycol (PEG) has been proven safe and effective when given at doses of 1 to 1.5g/kg per day for 3 to 6 days
- For **maintenance therapy:**
 - **Enough** medication should be used to reach a goal of regular, soft, and painless bowel movements and avoid re-accumulation of stool in the rectum

(JPGN 2014;58: 258–274)



- Constipation is **not self-limiting** and most children will not grow out of their symptoms without treatment.
- Maintenance treatment should continue for at least 2 months. **All symptoms of constipation should be resolved for at least 1 month before discontinuation of treatment**
- **Treatment should be decreased gradually**
- Medication should only be stopped once toilet training is established

(JPGN 2014;58: 258–274)



Tried that and still NOT WORKING

- Do you have the right diagnosis?
- Are you being aggressive enough?
- Do we need further testing? Is it time for neurogastroenterology?

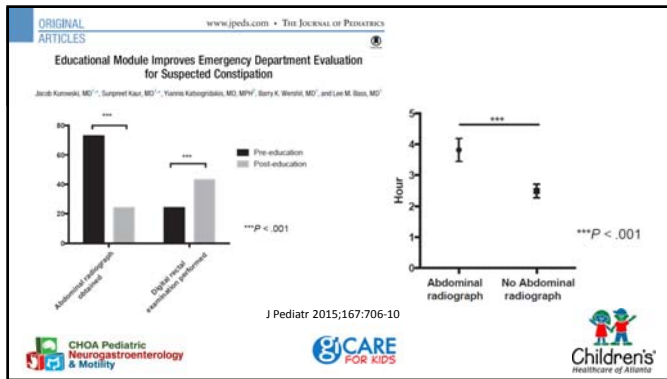


Constipation should NOT be BESTOWED UPON the patient it SHOULD BE COMPLAINED BY THE PATIENT



An abdominal X-ray **should not** be used to diagnose constipation.





Is it Constipation or IBS ?

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H2b. Irritable Bowel Syndrome

Diagnostic criteria* Must include **both** of the following:

- Abdominal discomfort** or pain associated with two or more of the following at least 25% of the time:
 - Improvement with defecation
 - Onset associated with a change in frequency of stool
 - Onset associated with a change in form (appearance) of stool
- No evidence of an inflammatory, anatomic, metabolic, or neoplastic process that explains the subject's symptoms

* Criteria fulfilled at least once per week for at least 2 months prior to diagnosis

** "Discomfort" means an uncomfortable sensation not described as pain.

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H3a. Functional Constipation

Diagnostic criteria* Must include **two or more** of the following in a child with a developmental age of at least 4 years with insufficient criteria for diagnosis of IBS:

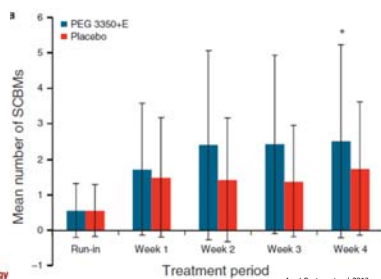
1. Two or fewer defecations in the toilet per week
2. At least one episode of fecal incontinence per week
3. History of retentive posturing or excessive volitional stool retention
4. History of painful or hard bowel movements
5. Presence of a large fecal mass in the rectum
6. History of large diameter stools which may obstruct the toilet

* Criteria fulfilled at least once per week for at least 2 months prior to diagnosis



Randomized Clinical Trial: Macrogol/PEG 3350 Plus Electrolytes for Treatment of Patients With Constipation Associated With Irritable Bowel Syndrome

Y.H. Chouhan, MD, Y. Nageshwar, MD, M. Sanyal, MD, D.P. and R. Gonsky, MD

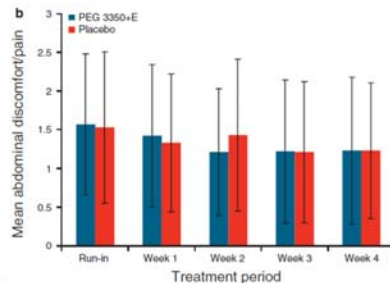


Am J Gastroenterol 2013



Randomized Clinical Trial: Macrogol/PEG 3350 Plus Electrolytes for Treatment of Patients With Constipation Associated With Irritable Bowel Syndrome

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Am J Gastroenterol 2013



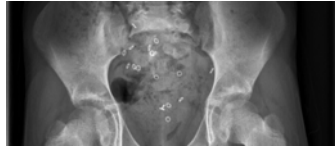
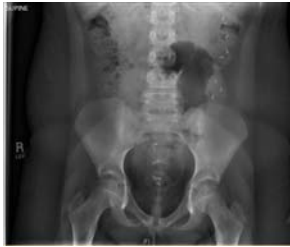
What about the 15 year old female that has not had a bowel movement in the past 30 days despite all sorts of laxatives?



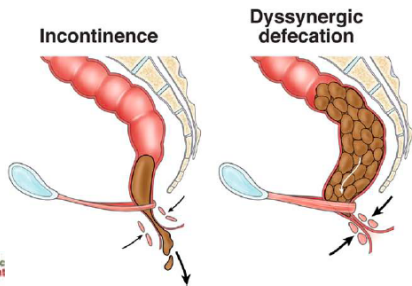
Radiopaque Markers

- Patients must be willing to **stop all laxatives for 5 days during the procedure**
- **Unknown effect of bowel cleansing vs not prepared on transit time**
- Different protocols
 - The most simple is an X-ray **on day 5 only**

A normal colonic transit study equates to the passage of **at least 80% of the markers (19 of the 24 markers) at 5 days**



Radiopaque markers can help differentiate between retentive and **NON retentive fecal incontinence**



Fecal incontinence

- Involuntary leakage of stool associated with :
 - Low self esteem
 - Bullying at school
 - Punishment by parents
- The **primary reason for FI in constipation is fecal retention**
- Study primary care setting in USA children 4 to 7 years prevalence of 4.4% of which 95% had underlying constipation
- Prevalence of fecal incontinence is higher (85%) in patients referred to a subspecialty clinic (J Pediatr 2002)

ORIGINALARTICLES

www.jpeds.com • THE JOURNAL OF PEDIATRICS

A Multicenter Study on Childhood Constipation and Fecal Incontinence: Effects on Quality of Life

Katja Kovacic, MD¹, Manu R. Sood, MD², Suzanne Mazze, MD, PhD³, Carlo Di Lorenzo, MD⁴, Samuel Narko, MD, MPH⁵, Nicole Heinz, BS⁶, Ananthasekar Ponambalam, MD⁷, Christina Beasley, BS⁸, Rina Sanghavi, MD⁹, and Alan H. Sierveman, PhD¹⁰

- Functional constipation + fecal incontinence, compared with functional constipation alone, significantly reduces child and family quality of life and general functioning
- Children with constipation related fecal incontinence **do not wait longer** than those with constipation before seeking medical help

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(J Pediatr 2015;166:1482-7).

Tried that and still NOT WORKING

- Do you have the right diagnosis?
 - Not constipated
 - IBS
 - Non retentive fecal incontinence
- Are you being aggressive enough?
- Do we need further testing? Is it time for neurogastroenterology?

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graph TD; RH[Rectal hyposensitivity] --> M[Megarectum]; M --> RHC[Rectal hypercompliance]; RHC --> DU[Decreased urge]; DU --> I[Impaction]; I --> RS[Retention of stools]; RS --> W[Withholding]; W --> PS[Painful stools]; PS --> II[Increased impaction]; II --> OI[Overflow Incontinence]; OI --> RH;
```

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Stimulant laxatives (senna and bisacodyl) are widely available and likely underutilized








3 rules

- Take the medicine EVERY DAY at the SAME TIME
- Sit on the toilet After breakfast, after dinner and if belly cramps
- Call to adjust regimen if any accidents, no stool in 48 hours, too hard or too loose
- Once doing well I continue treatment for 6 months and then follow up with a slow wean



To the rescue!!!



Tried that and still NOT WORKING

- Do you have the right diagnosis?
 - Not constipated
 - Functional constipation vs IBS
 - FNRFI
- Are you being aggressive enough?
 - Stimulants
 - Higher dose
 - Compliance
- Do we need further testing? Is it time for neurogastroenterology?



Anorectal Manometry



Indications

1. Diagnose **non-relaxing internal anal sphincter**
2. Assess anorectal motility in children with **chronic constipation and/or fecal incontinence with persistent symptoms** despite treatment
3. **Persistent symptoms** (incontinence or obstruction) **after surgery for Hirschsprung disease** and to evaluate need for botulinum injection to sphincter
4. Evaluate **anorectal function** in patients with **imperforate anus repair**
5. **Biofeedback** therapy



Measurements

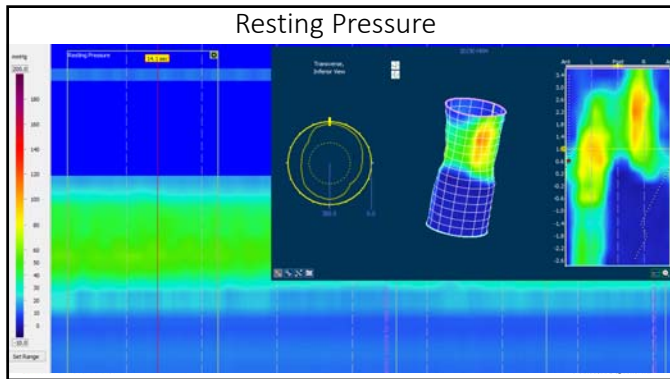
1. Resting Anal Pressure
2. Recto-Anal Inhibitory Reflex (RAIR)
3. Squeeze Pressure
4. Rectal Sensation Testing
first perception, desire to defecate, severe urgency

5. Defecation Dynamics

Challenging to perform in younger children!

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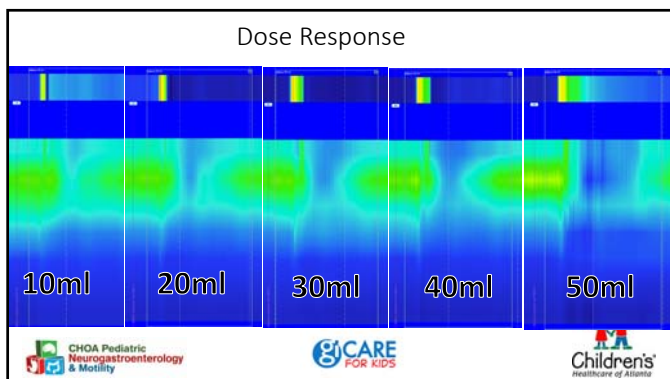
RAIR

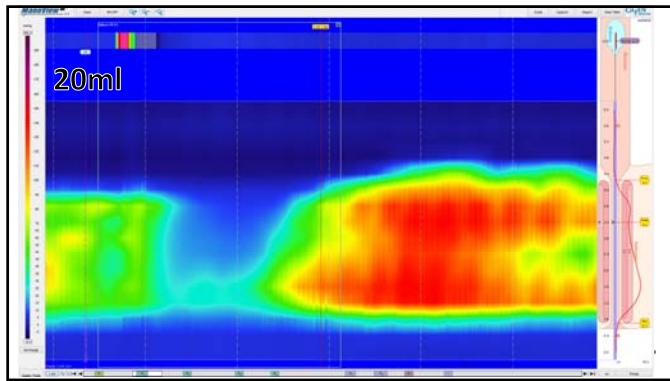
- Rectal distension is associated with a decrease in anal resting pressure, known as the rectoanal inhibitory reflex (RAIR)
- Mediated by the myenteric plexus.

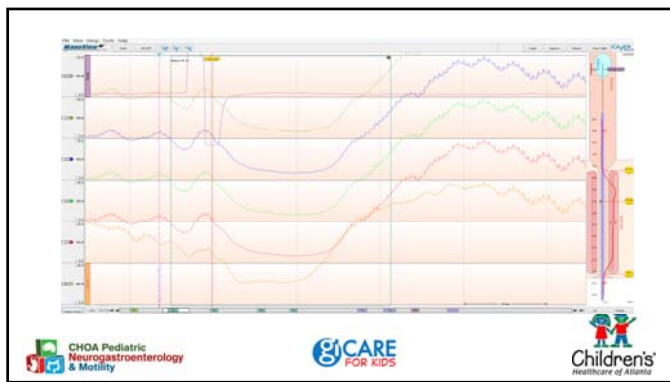
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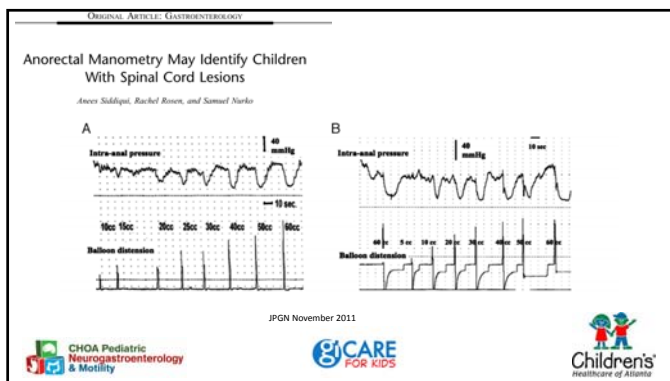
iGARE
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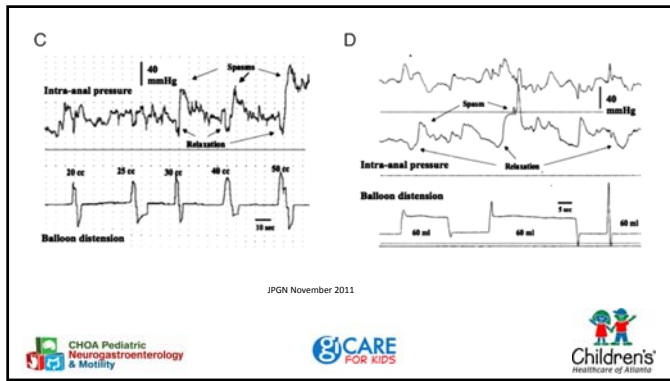
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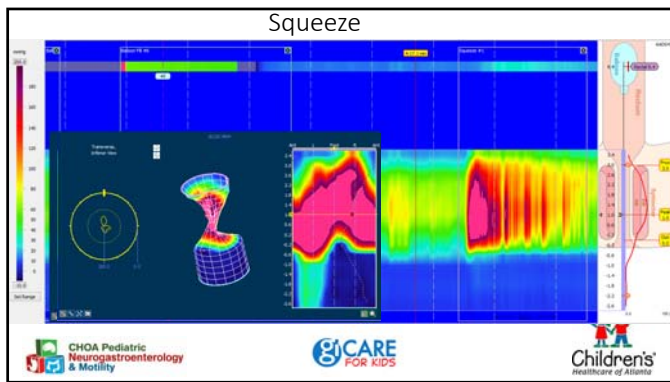


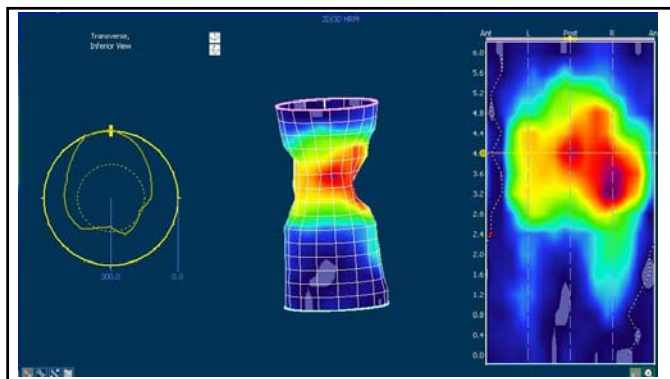




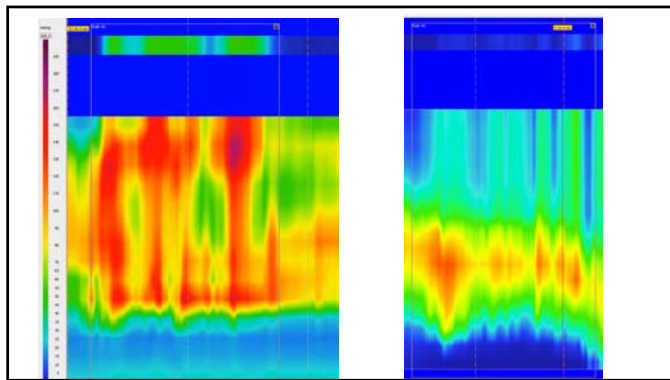






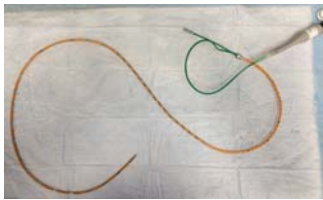









Colonic Manometry

- Evaluates the intraluminal pressure activity of the colon and return









Indications

1. Select medical and surgical treatment **when conventional and behavioral treatments have failed**
2. Colonic involvement in chronic intestinal pseudo-obstruction
3. Clarify the **pathophysiology of persistent symptoms** after:
 - Removal of the aganglionic segment in patients with Hirschsprung disease
 - Repair of other colorectal disorders (imperforate anus)
 - Antegrade Continence Enemas
4. Evaluate the function of a diverted colon before possible closure of a stoma or in those undergoing intestinal transplantation



ORIGINAL ARTICLE: GASTROENTEROLOGY

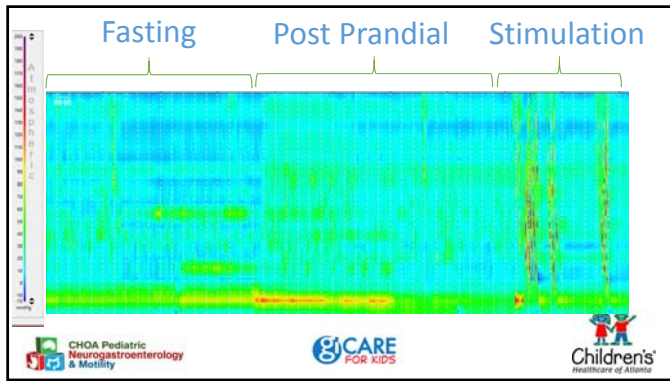
Colon Manometry Proves That Perception of the Urge to Defecate Is Present in Children With Functional Constipation Who Deny Sensation

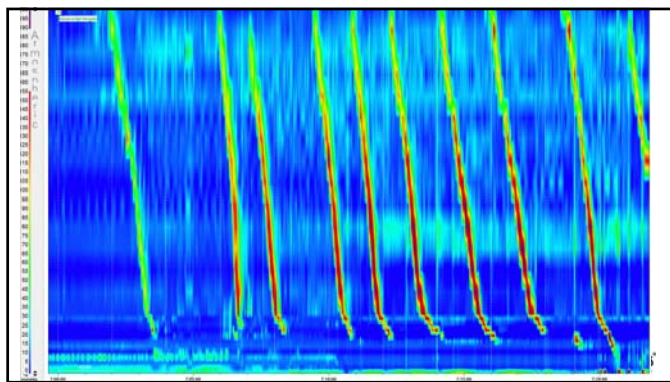
*Carrie Firestone Baum, *Amub John, *Kavitha Srinivasan, *Prince Harrison, *Andrew Kolomoisky, *Javier Monagan, *Jose Cocjin, and *Paul E. Hyman*

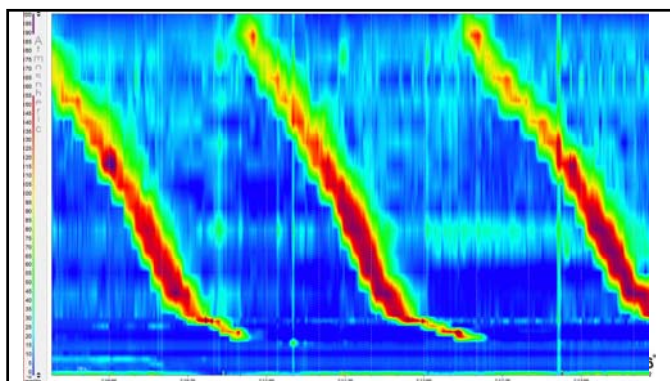
- Observe the **behaviors associated with the HAPC**:
 - Requests to use the bedside commode or defecation into a diaper, stoic retentive posturing, screaming, etc.
- When queried subjects with retentive posturing initially denied sensation

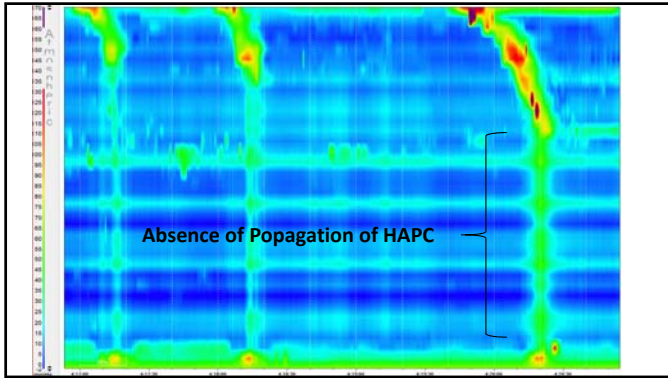


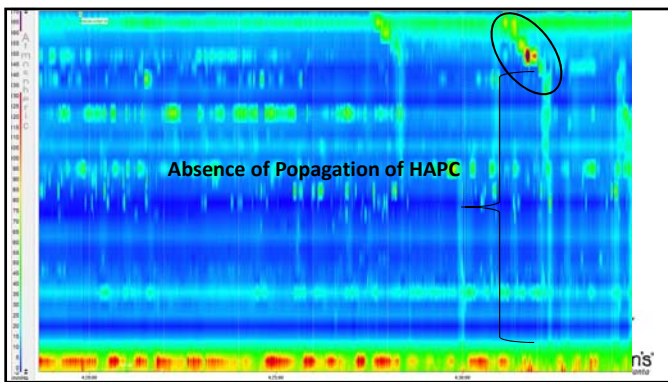






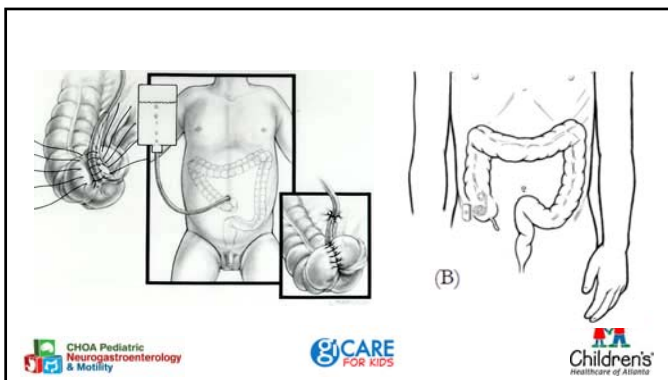












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Lack of Agreement on How to Use Antegrade Enemas in Children

Authors: Sophie Rutemage-Wessels^{1,2}, Hayat M. Mousa¹, Mark A. Hausman¹,
Cathy De Looze¹

Affiliations: ¹Department of Pediatric Gastroenterology, Nationwide Children's
Hospital, Columbus, OH, USA; ²Department of Pediatric Gastroenterology, Emma
Children's Hospital AMC, Amsterdam, The Netherlands

Address correspondence to:
Sophie Rutemage-Wessels
Emma Children's Hospital / AMC
Department of Pediatric Gastroenterology
Meibergdreef 39
1105 AZ Amsterdam
Phone: +31(0)20 666 6270
Fax: +31(0)20 666 6476
E-mail address: s.rutemage@amc.uva.nl

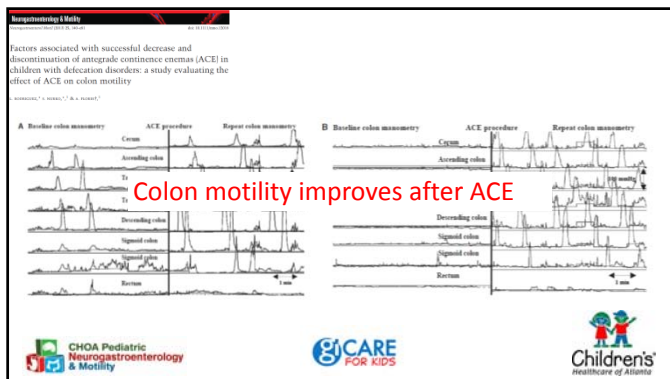
Conflict of Interest and Funding Source

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Wide variation:

- Reported Outcome
- Success is defined
- Time spent in toilet
- When to administer
- What to administer
- When to wean
- How to wean

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