

# Chronic functional constipation treatment

iatrics

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IUMS

- ▶ Functional constipation is defined by criteria that include:
  - ▶ infrequent,
  - ▶ hard, and/or large stools
  - ▶ fecal incontinence
  - ▶ painful defecation
  - ▶ or volitional stool retention,
- ▶ if these symptoms are not explained by another medical condition, as outlined by the Rome IV consensus .
- ▶ abdominal pain is not among the diagnostic criteria.

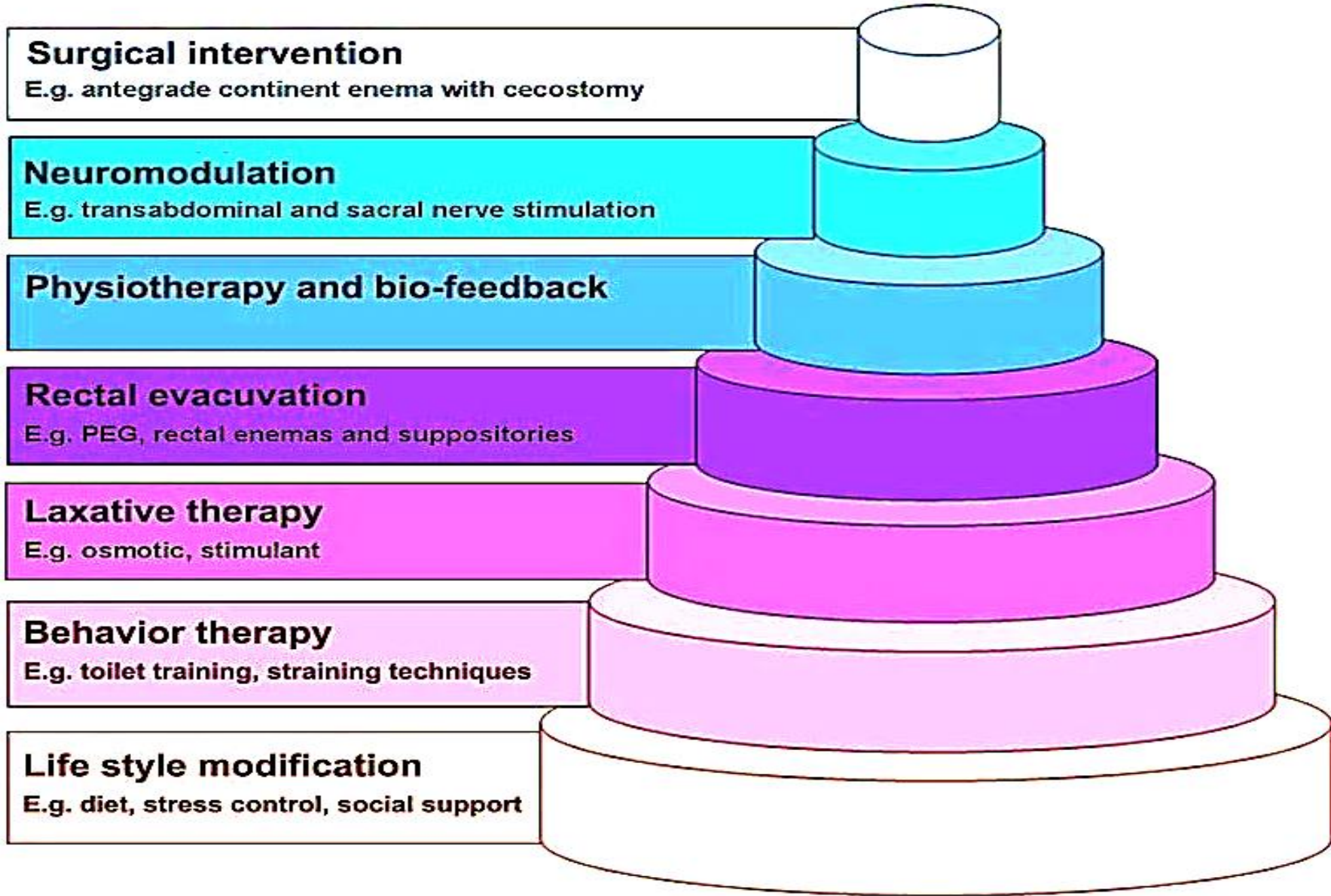
- ▶ Constipation is common among children, affecting up to 30 percent of children and the vast majority of chronic constipation is functional.
- ▶ The approach to treatment of functional constipation depends on:
  - ▶ the child's age
  - ▶ presence of underlying behavioral disorder(ADHD-AUTISM)
  - ▶ dietary triggers
  - ▶ chronicity of the symptoms
  - ▶ severity of the symptoms
  - ▶ Family behavior and life style

- ▶ Constipation in infant
- ▶ Constipation in children and adolescence:
  - ▶ Mild -Moderate - severe
  - ▶ Repeated relapses despite adequate compliance with a maximal laxative regimen
  - ▶ Refractory constipation
  - ▶ Functional fecal incontinence
  - ▶ Nonretentive fecal incontinence
  - ▶ Fecal impaction

# goal of therapy

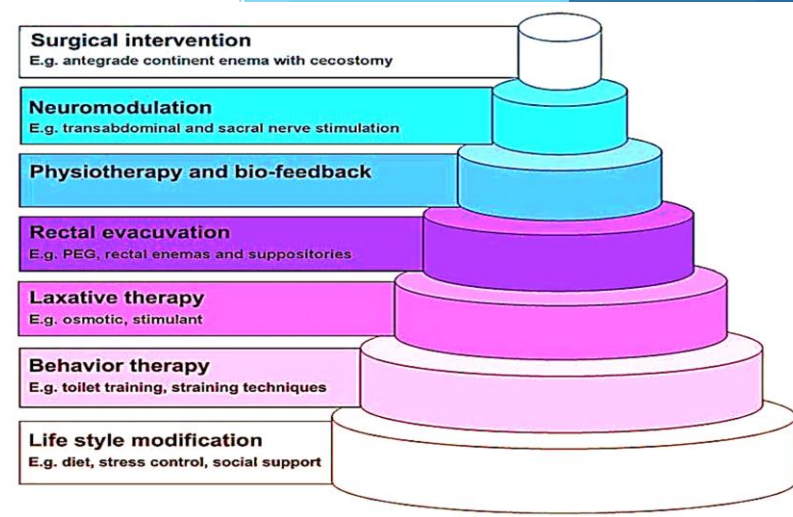
- ▶ The goal of therapy is the passage of soft stools, ideally once per day, and no less than every other day.
- ▶ Weeks to months, and sometimes years, of laxative and behavior therapy may be necessary before this goal is achieved.



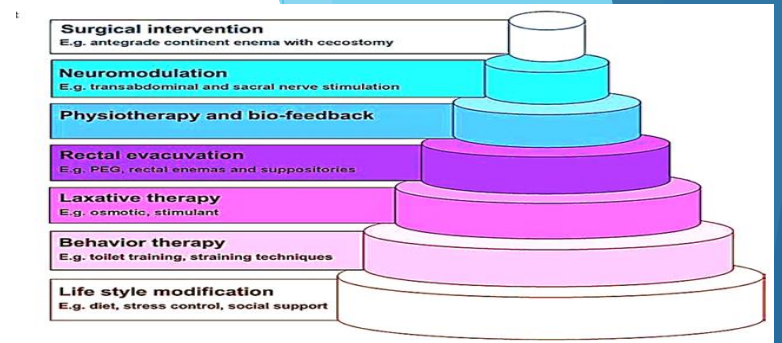


# Counseling for parents or caregivers

- ▶ Remove negative attributions
- ▶ Understand the recurring nature of constipation and how to reverse this
- ▶ Both behavioral interventions and laxatives are important parts of treatment
- ▶ Recovery will be gradual



# Behavior modification



## ▶ Toilet sitting:

- ❑ The child should sit on the toilet shortly after a meal for 5 to 10 minutes, two to three times per day
- ❑ Toilet sitting episodes should occur at the same time each day and be timed with a timer or stopwatch
- ❑ The routine should be followed every day, particularly during times of transition (holidays, vacations, or weekends)
- ❑ The child's adherence to the program should be encouraged with positive reinforcers, rather than negative reinforcers (criticism or punishment).
- ❑ For children whose feet do not touch the floor sitting on a regular toilet seat, it is helpful to use a stool for foot support

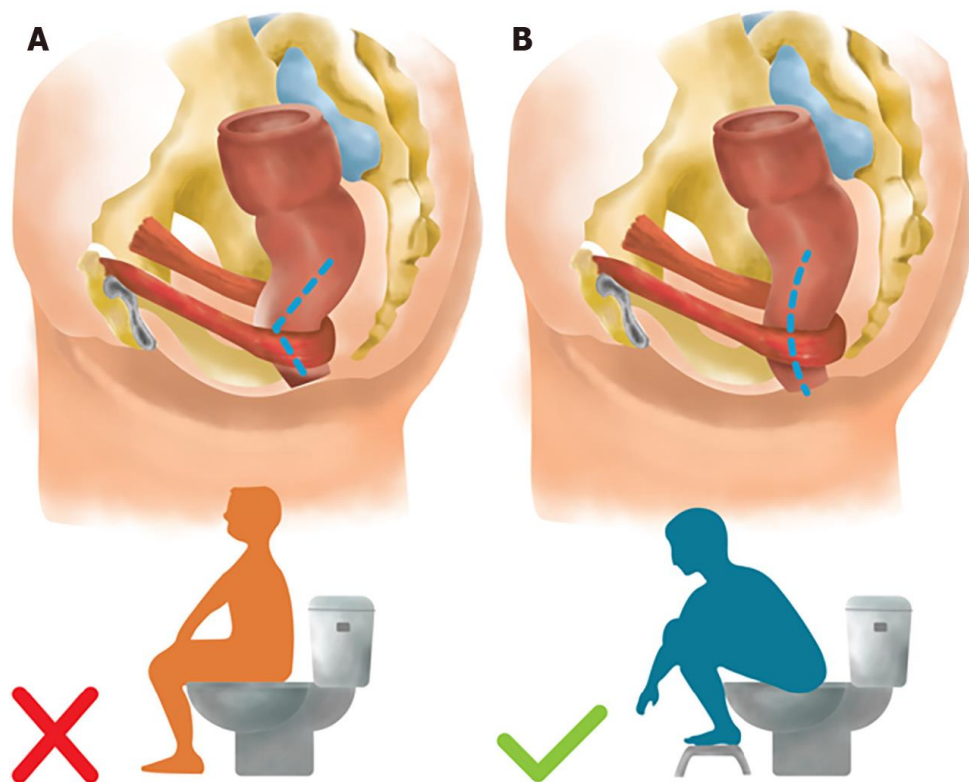
## ▶ Reward system

# Behavior modification

Toilet-sitting  
Reward system  
Monitoring

Proper positioning on the toilet for a child

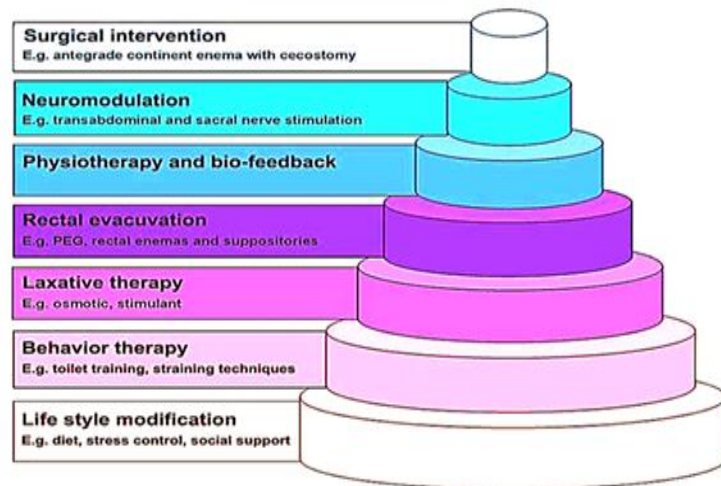




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## Dietary changes

- ▶ Fiber?
- ▶ Fluid intake: 1 to 2 liter
- ▶ Cow's milk? No > 720 cc
- ▶ Dietary changes **should not be forced**, nor should they replace the other interventions described above.



# Constipation in infant( mild?- moderate? - sever?)

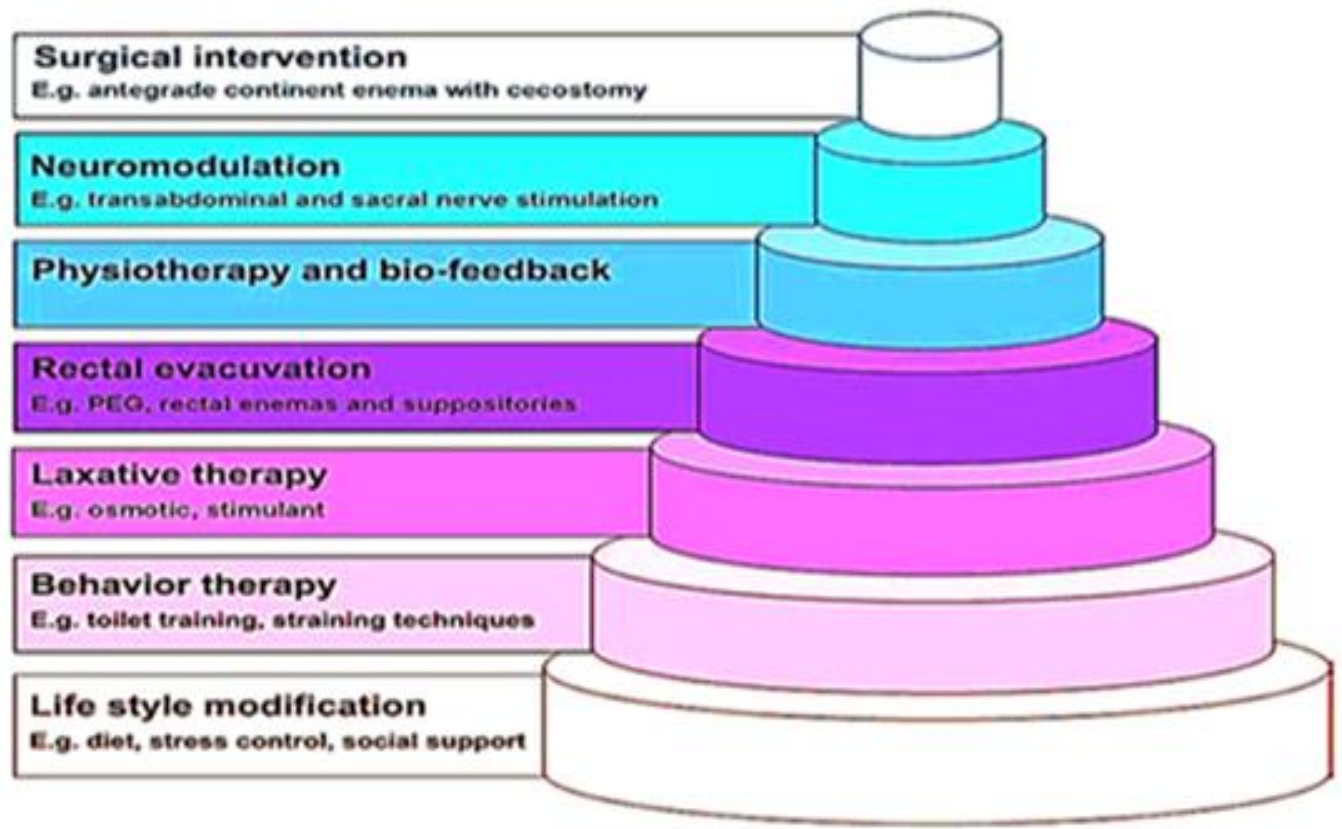
- ▶ **Initial measures** (nonpharmacologic):
  - ▶ nondigestible osmotically active carbohydrates(apple, prune, or pear)
- ▶ **Medications:**
  - ▶ osmotic laxative:Lactulose or sorbitol-Polyethylene glycol 3350?
  - ▶ senna tried short-term
  - ▶ glycerin suppository

# Constipation in infant

- ▶ drugs are **not recommended** for infants:
  - ▶ Mineral oil
  - ▶ Enemas -Occasionally, pure saline enemas (with no phosphate) may be used for infants but only when necessary and under close medical supervision.
  - ▶ Bisacodyl

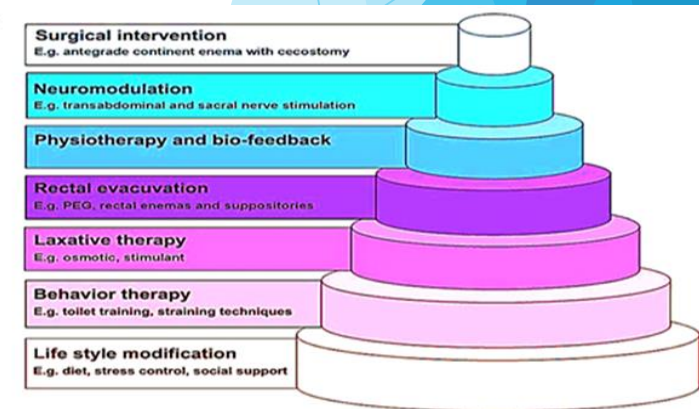
# Drugs

- ▶ Disimpaction
- ▶ Maintenance
- ▶ weaning



# Drugs : PERORAL - PER RECTAL

- ▶ **Osmotic Laxatives(first choice)** :(PEG/ Lactulose and Lactitol/MOM)
- ▶ **Stimulant Laxatives ( 1<sup>st</sup> or 2ed choice)**:( Bisacodil/senna)
- ▶ Lubricants:(mineral oil/glycerin)
- ▶ Enemas:(Sodium docusate/ Sodium lauryl sulfoacetate/ Sodium phosphate enemas/ olive oil enemas+ glycerin/ NS)
- ▶ Novel Therapies:(Lubiprostone, **linaclotide**, and plecanatide/ prucalopride, velusetrag, and naronapride/tegaserod)>6y??
- ▶ Bile Acids:(Chenodeoxycholic , Elobixibat)
- ▶ Cholinesterase Inhibitors:(Pyridostigmine)
- ▶ Botulinum Toxin Injection (Botox®)



# Management of relapses

- ▶ One of these steps should be taken if the child has not had a bowel movement for several days:
  - ▶ If PEG has been prescribed, ensure that the parent/caregiver are mixing it as advised in the correct type and amount of fluid (water, juice, or soda; milk and the child drinks this within 30 minutes and does not sip it throughout the day or bring it to school.
  - ▶ Briefly increase the dose of oral laxative (double the dose for one to three days, until the child is having large soft stools).
  - ▶ Give one or two doses of a stimulant laxative, such as **senna and bisacodyl**.
  - ▶ Use an enema to empty the rectum

# Disimpaction (for select children)

## ▶ Indications:

- Constipation-associated fecal incontinence
- Significant stool mass palpable on abdominal or digital rectal examination or on abdominal radiograph
- History of incomplete or infrequent evacuation

# Treatment plan with fecal incontinence and impaction

	A. Small fecal impaction(oral medications)	B. Large fecal impaction(oral and rectal medication)
day1	Educate family-long term laxative therapy Start PEG 1 gram/kg once daily, given in the morning	Educate family -Start PEG 1 to 1.5 grams/kg daily, divided into two doses
day2to3	Continue PEG once daily	Continue PEG twice daily
day 4 to 6	If child is beginning to pass 1 to 2 soft to loose stools daily, continue above dose of PEG If child is not passing soft to loose stools, increase dose of PEG to 1.5 grams/kg, divided into two doses. Soiling should gradually decrease and stop. Establish regular toileting patterns by having the child sit on the toilet for 5 to 10 minutes, 2 to 3 times daily after meal	If child has not passed a large amount of stool, give sodium phosphate enema (, Fleet enema), 33 to 66 mL, depending on the size of the child Continue twice daily dosing of PEG for up to six days total, until the child has passed a large amount of stool Once the child is having soft stools at least once daily, reduce PEG to 1 gram/kg, given once daily in the morning). Establish regular toileting patterns

# Treatment plan with fecal incontinence and impaction

	A. Small fecal impaction	B. Large fecal impaction
Day 7 to 30	Be sure parent <b>calls if not making progress</b> , so further adjustments in PEG dose can be made. Occasionally it is necessary to increase PEG to twice daily dosing.	
1 month	Return <b>office visit</b> to evaluate progress and to reinforce need for regular laxative therapy Provide handout or references for fiber-rich diet and have family work to increase fiber content of diet, for long-term maintenance	
1 to 6 months	Return <b>office visit every 1 to 2</b> months to reinforce therapy and adjust dose of laxative if necessary	
6 to 12 months (or longer)	Once the child is maintaining normal bowel movements without soiling for several months, consider <b>gradually tapering laxative over 2 months</b> Be sure patient is on a fiber-rich diet Some children require ongoing laxative treatment for one or more year	
Beyond 12 months	Follow as long as it takes for resolution. Can be months to several years before encopresis resolves completely	

## Typical regimen for a child with recurrent or chronic constipation without fecal impaction or incontinence(mild)

- ▶ **Step 1-** Start 2 to 4 teaspoons (4.5 teaspoons = 17 grams) of PEG 3350 once daily, in 4 to 8 ounces (120 to 240 mL) of noncarbonated beverage (or appropriate dose of another laxative).
- ▶ **Step 2-** Increase or decrease PEG 3350 by 1 to 2 teaspoons every 2 to 3 days, until the desired result of daily soft stools is achieved. **Maximum dose is 1 heaping tablespoon (17 grams) twice daily.**
- ▶ **Step 3-** Follow-up by phone or a return **visit within 1 month** to be sure the laxative is effective.
- ▶ **Step 4-** Continue to work on adding dietary fiber and extra liquids to the diet each day.
- ▶ **Step 5-** **After 6 to 8 weeks of soft daily bowel movements, begin to taper the dose of PEG 3350 by ½ to 1 teaspoon every 2 weeks, until daily movements continue without the need for a laxative.**
- ▶ **Step 6-** If stools become hard once again, increase the dose slightly and retry weaning off the laxative in another 6 to 8 weeks.
- ▶ **Step 7-** This process may take from 2 to 4 weeks to six months, but the end result should be resolution of the constipation.

# Moderate to severe FC

- ▶ Prolonged interval between defecation
- ▶ Pain and bleeding
- ▶ Severe withholding behavior
- ▶ High caliber stool

**Osmotic +stimulant laxative**

# Stimulant laxatives

- ▶ Stimulant laxatives, such as [senna](#) and [bisacodyl](#), are used in several ways:
- ▶ ● **Rescue therapy** - Used for **brief periods to avoid recurrence of impaction**, in addition to osmotic laxatives.
- ▶ ● **Maintenance therapy** - Used as part of a maintenance regimen for children with insufficient response to or difficulty tolerating osmotic laxatives.
- ▶ ● For **refractory constipation** - Used as a first-line intervention for children with refractory constipation, typically at high doses

# Tapering laxative therapy

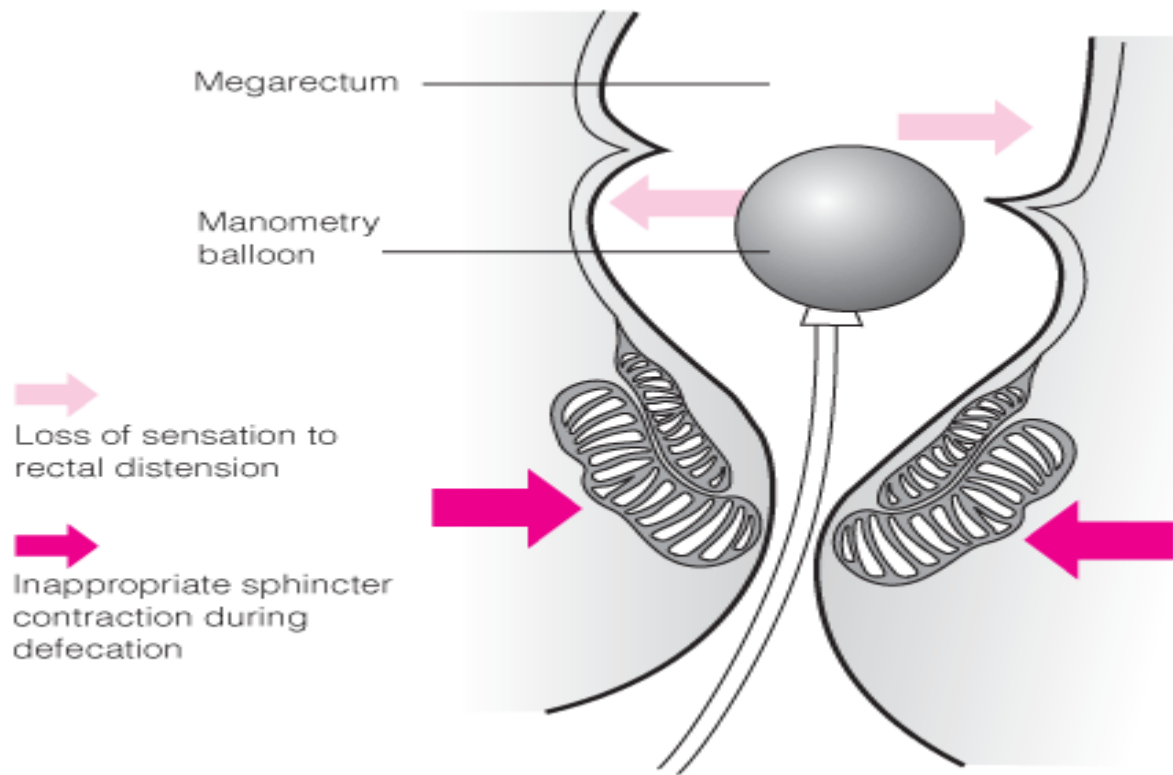
- ▶ After **optimal bowel habits** are achieved and stable for at least six months
- ▶ The laxative dose is gradually decreased to a dose that will prevent fecal incontinence and maintain one to two bowel movements per day
- ▶ As laxative therapy is discontinued, it is particularly important to reemphasize compliance with the behavioral and dietary regimens because this may help avoid relapses.

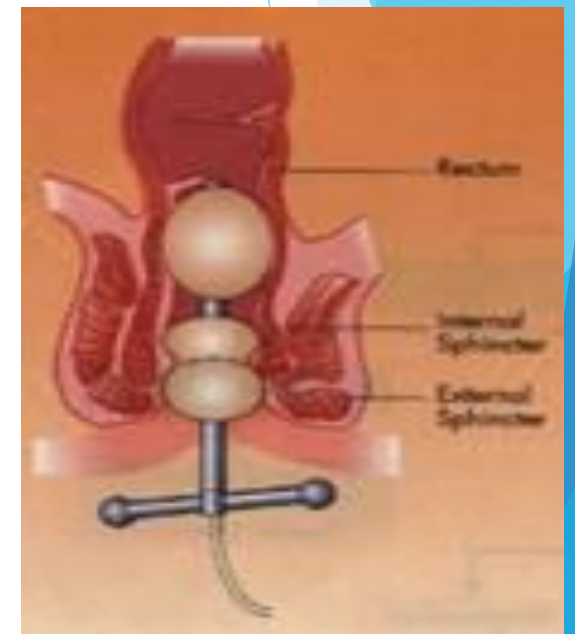
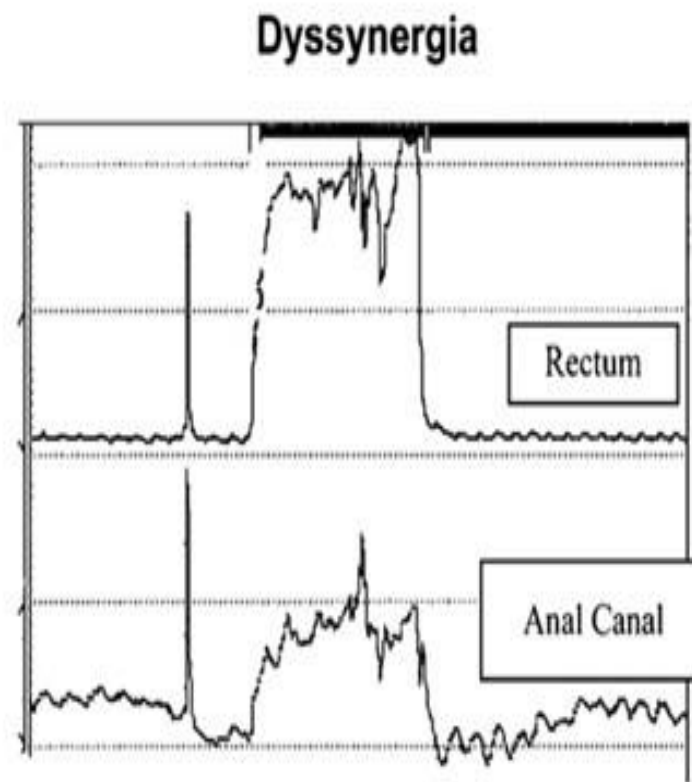
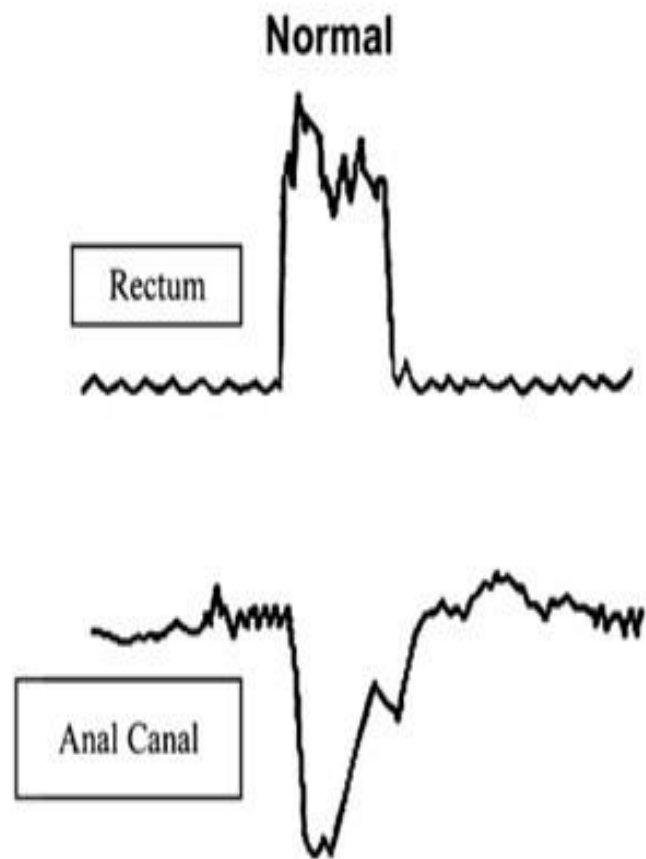
# Refractory constipation

- ▶ **Diagnostic criteria** – Refractory constipation is defined as ongoing symptoms of constipation ( $\leq 2$  voluntary defecations and/or  $\geq 1$  episode of fecal incontinence per week) with impaired quality of life despite treatment with **all** of these interventions for at least **three months**:
  - ▶ ● **Daily use of a stimulant** laxative at appropriate dose (regardless of osmotic laxative use)
  - ▶ ● Behavioral interventions
  - ▶ ● Biomechanical interventions (correct positioning on toilet)

# REFRACTORY CONSTIPATION evaluation

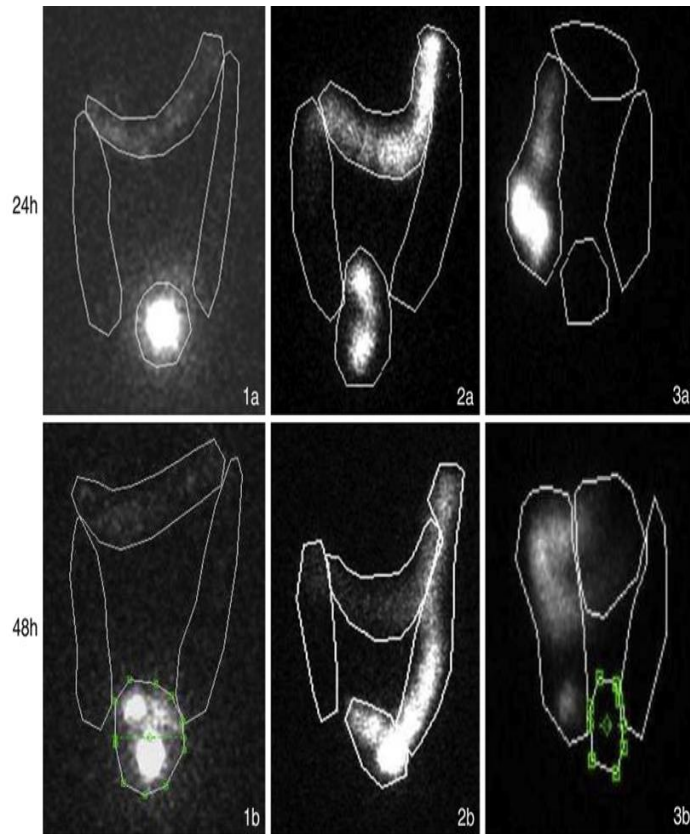
- ▶ Hx- PE-Rectal exam
- ▶ celiac disease
- ▶ thyroid disease
- ▶ Ab xray?
- ▶ Anorectal manometry and/or balloon expulsion testing
- ▶ Colon transit studies
- ▶ Colon manometry
- ▶ Defecography
- ▶ LSMRI
- ▶ **Contrast enema**
- ▶ Transabdominal ultrasonography
- ▶ Wireless motility capsule
- ▶ Rectal biopsy





# Normal Defecogram

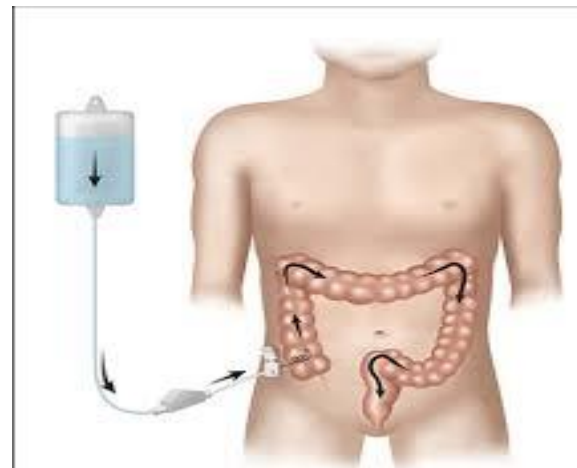
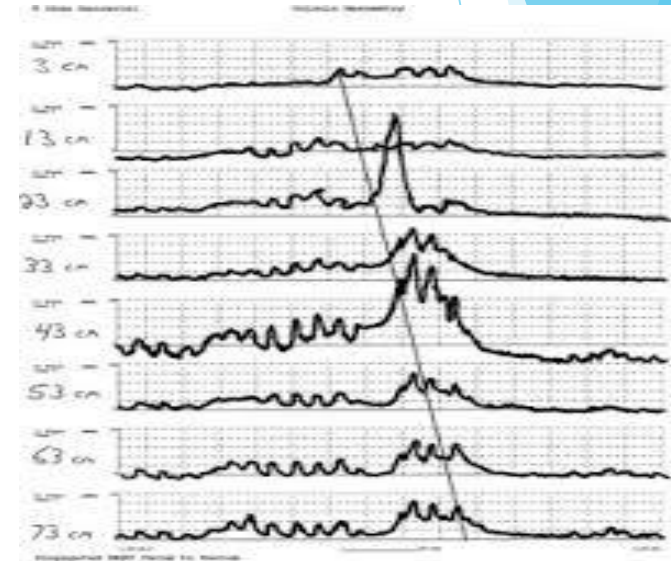
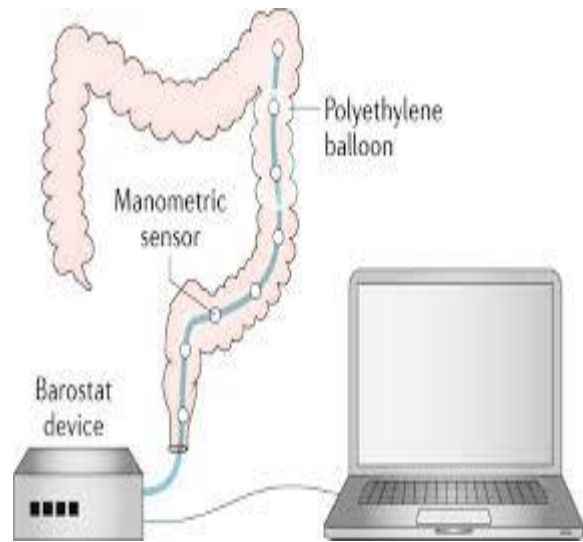




**Figure 11-4.** An example of a normal scintigraphy study at 24 hours (1a) and 48 hours (1b); study of a patient with dysfunctional part of the colon at 24 hours (2a) and 48 hours (2b); and study of a patient with colonic inertia at 24 hours (3a) and 48 hours (3b). Colonic manometry and colonic scintigraphy as a diagnostic tool for children with severe constipation. (Mugie et al. JPGN 2013;57:598–602.) See also color plate.



**Figure 11-3.** Delayed colonic transit time. Abdominal radiograph shows sitz markers throughout the colon.



# REFRACTORY CONSTIPATION

- ▶ optimization of osmotic and/or stimulant laxatives at standard doses, the next step is to escalate to high doses of the stimulant laxative .
- ▶ (PEG)+bisacodyl or senna(optimal dose)
- ▶ ??>6 y An insufficient response to an optimal regimen of osmotic and stimulant laxatives, one of the newer laxatives (linaclotide, lubiprostone, prucalopride) may be trialed, either as an adjunct to high-dose stimulant laxative or as an alternative if the stimulant laxative is not tolerated.
- ▶ Behavioral interventions

# REFRACTORY CONSTIPATION

- ▶ Dyssynergic pelvic floor
- ▶ ( low motile)

# REFRACTORY CONSTIPATION

## pelvic floor dyssynergy

- ▶ pelvic floor physical therapy (PFPT)+OR- biofeedback
- ▶ PFPT can be used in pediatric patients with demonstrated dyssynergic defecation on ARM.
- ▶ Anal dilation?/, ( IAS myectomy?? anal achlasia), and anal botulinum toxin injection(anal achalasia-FC)



## REFRACTORY CONSTIPATION SUEGERY( low motile)

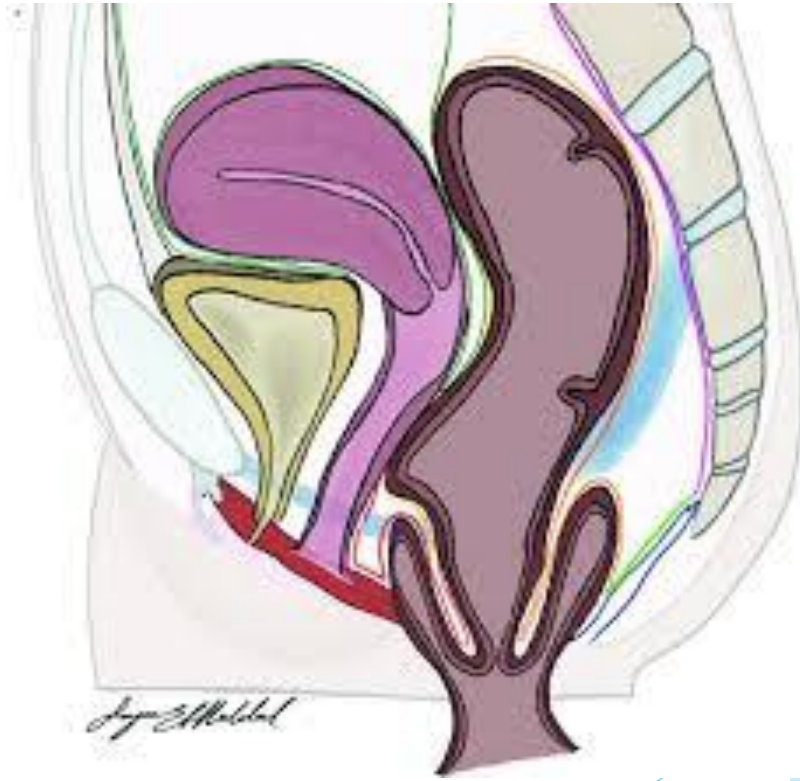
- ▶ SNS is a treatment option in select children with RC and may be considered as an adjunct treatment.
- ▶ Antegrade continence enemas(ACE)
  - ▶ Indications for ACE include :
    - ▶ improving autonomy in patients regularly using retrograde enemas,
    - ▶ the failure to adequately treat RC after maximizing pharmaceutical options,
    - ▶ the inability to use oral or rectal therapies in the treatment of RC.



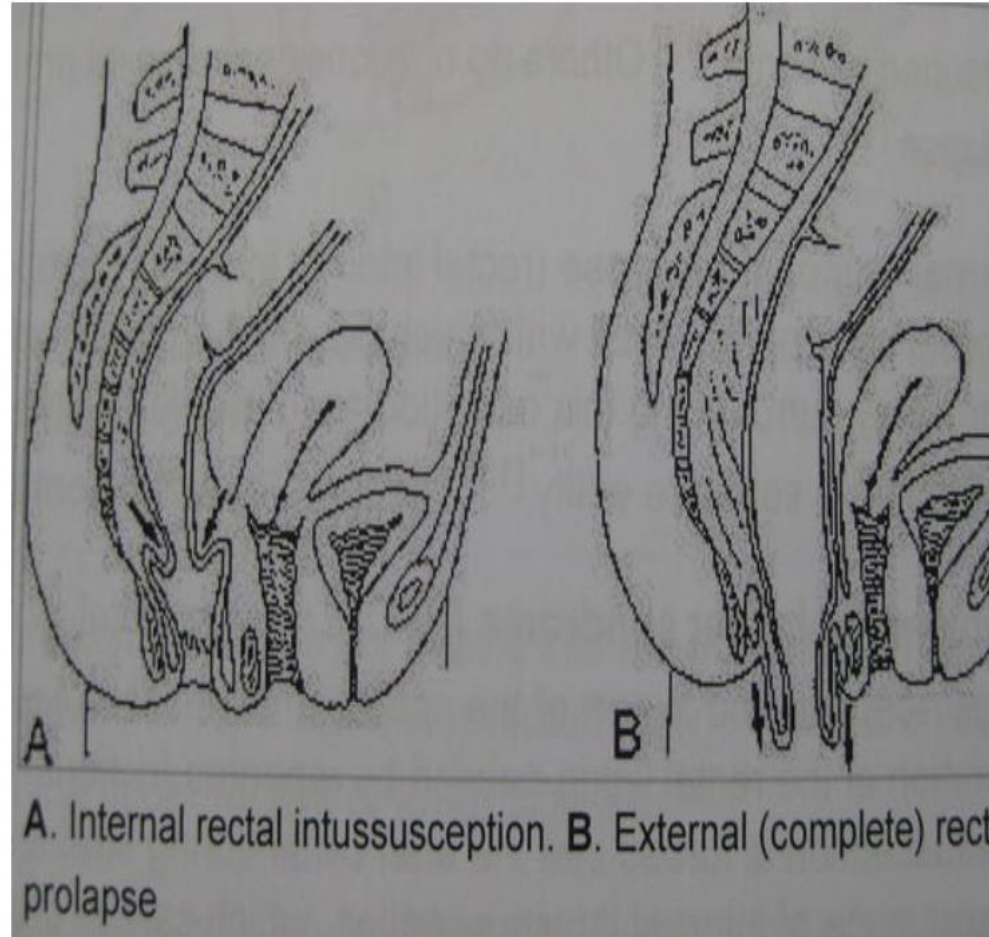
# REFRACTORY CONSTIPATION

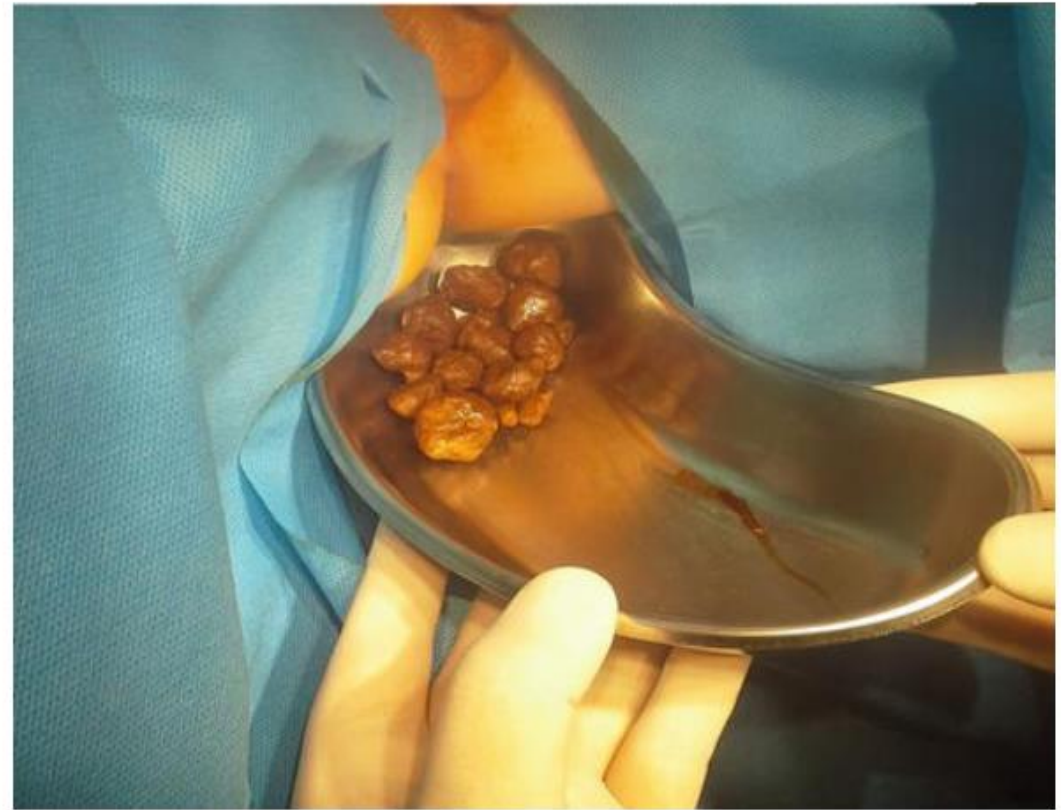
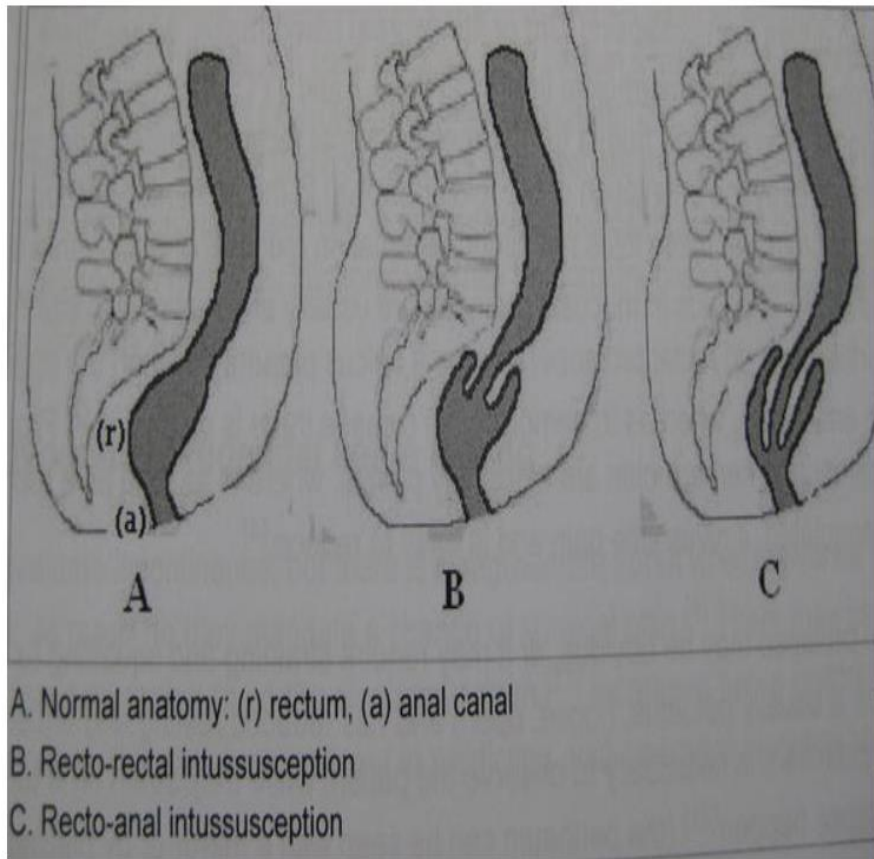
- ▶ Colonic diversion and colectomy(segmental or subtotal)
- ▶ DELSHAD mesh test and procedure:

Internal rectal prolapse in children is one of the causes of annoying and drug-resistant constipation

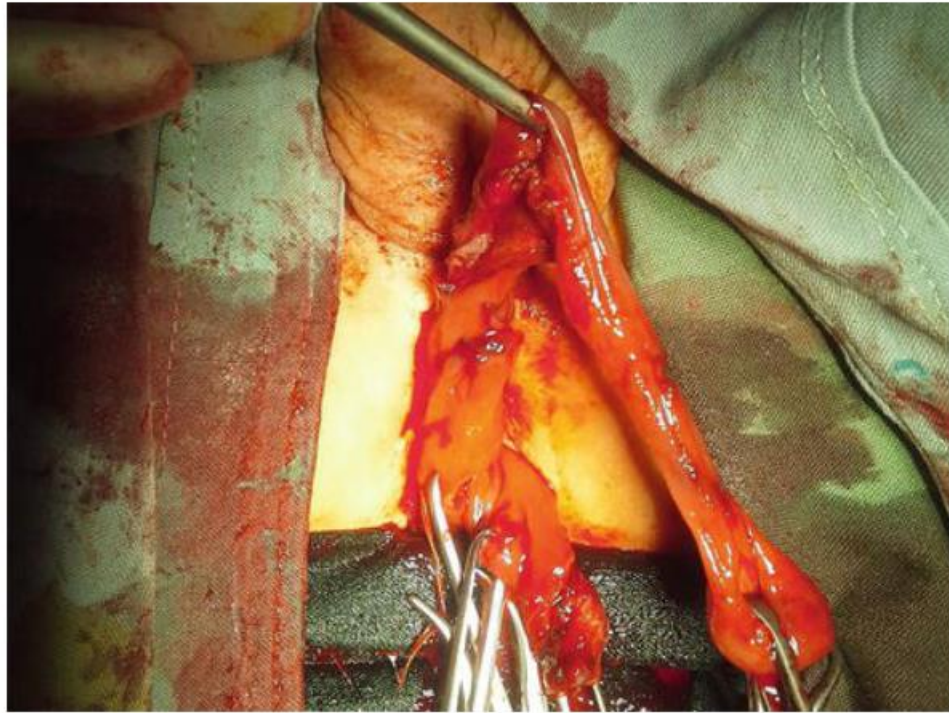


# Treatment of internal rectal prolapse in children: A cross sectional study









# TREATMENT OF NONRETENTIVE FECAL INCONTINENCE

- ▶ **No widely effective treatments** have been established for non-retentive fecal incontinence, but most approaches focus on behavior modification and psychosocial diagnosis and support
- ▶ highly structured toilet training protocol designed to encourage frequent and sustained efforts at defecation and supported by **behavior modification techniques including a reward system.**
- ▶ **Laxatives, enemas, and biofeedback are not helpful** in these children



Any question?



# Dietary changes

- ▶ Fiber
- ▶ Fluid intake((960 to 1920 mL)??
- ▶ Cow's milk

# Repeated relapses despite adequate compliance with a maximal laxative regimen

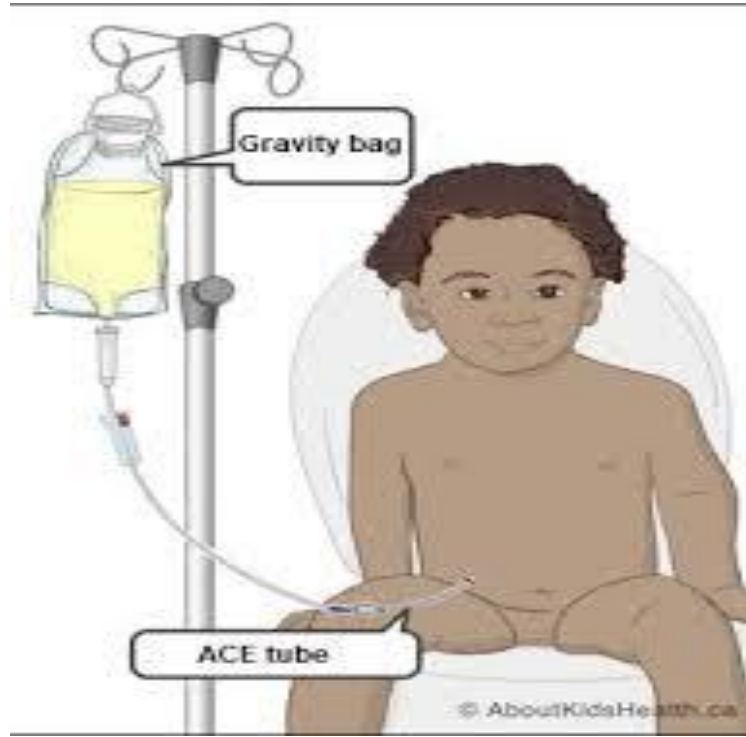
- ▶ Anorectal manometry and/or balloon expulsion testing
- ▶ Colon transit studies
- ▶ Colon manometry



# REFRACTORY CONSTIPATION

## surgical interventions

- ▶ Sacral nerve stimulation
- ▶ Antegrade continence enema (ACE)
- ▶ Intestinal diversion
- ▶ Colonic resection
- ▶ Delshad mesh test and procedure



# Constipation in babies (0 to 6 months)

- ▶ Give your baby a warm bath to relax their bowel.
- ▶ Gently massage your baby's tummy in a clockwise direction. Make firm but gentle circular motions from the belly button outwards.
- ▶ Lie your baby on their back and gently move their legs backwards and forwards in a 'bicycle' motion.
- ▶ Never give your baby laxatives unless a doctor or public health nurse advises you to.
- ▶ Make sure your baby is getting their daily fluid needs. Babies from 0 to 6 months should take in 700 ml of fluids per day, from breast milk or formula milk.



No organ in the body is so  
misunderstood, so slandered and  
maltreated as the colon

Sir Arthur Hurs, 1935

OLD SAYING.. NOT TRUE ANYMORE



<b>Osmotic and lubricant laxatives</b>	
PEG 3350 powder (MiraLax, GlycoLax) *¶	
Children and adolescents (weight-based dosing)	0.4 to 0.8 g/kg per day <sup>Δ</sup> ; maximum 17 g per day for starting dose
Children (age-based dosing)	
6 to 18 months	0.5 to 1 level teaspoon (approximately 2 to 3 g) once per day <sup>Δ</sup>
18 months to 3 years	2 to 3 level teaspoons (approximately 7 to 10 g) once per day <sup>Δ</sup>
Older than 3 years	2 to 4 level teaspoons (approximately 7 to 13 g) once per day <sup>Δ</sup>
Adolescents and adults	17 g (approximately 1 heaping tablespoon, 1 cap measure, or 1 packet) once per day in 8 oz of beverage <sup>Δ</sup>
Lactulose (10 g/15 mL solution)	
Children	1 mL/kg (0.67 g/kg) once or twice per day (maximum 60 mL per day for starting dose)

# Dietary changes

- ▶ During the treatment of chronic constipation and/or fecal incontinence, it is important to ingest a diet that promotes soft but bulky stools.
- ▶ Increased intake of fruit and raw vegetables, bran, and whole-grain breads and cereals is commonly recommended, as is adequate intake of fluids other than milk.
- ▶ Dietary changes **should not be forced**, nor should they replace the other interventions described above.
- ▶ to avoid dietary changes in the initial management to allow the family to focus their efforts on medications and toileting behaviors.
- ▶ **Fluid intake** - To ensure adequate hydration, children with chronic constipation or fecal incontinence should be encouraged to consume at least 32 to 64 ounces (960 to 1920 mL) of water or other nonmilk liquids per day, particularly if they are using fiber supplements.
- ▶ **Cow's milk** - In children whose constipation is unresponsive to other noninvasive measures (behavioral and dietary interventions, with or without oral laxatives) and especially in those with atopic symptoms, it suggested a trial for at least two weeks of eliminating all cow's milk protein from the diet

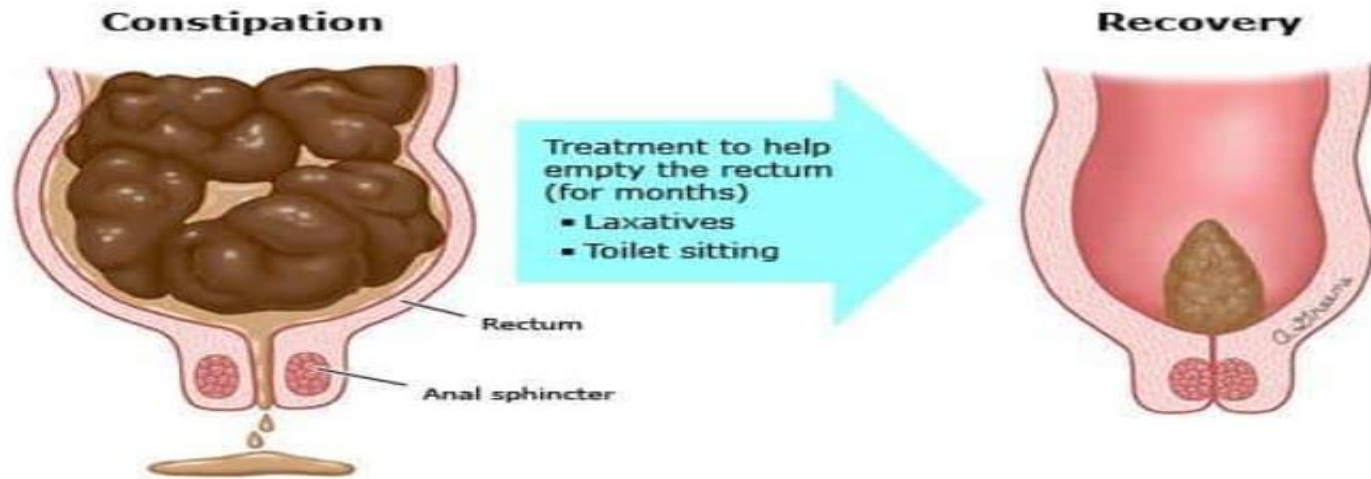




## Example of treatment plan for a 4-year-old child with fecal incontinence

	Small fecal impaction (oral medications)	Large fecal impaction (oral and rectal medication)
Day 1	Educate the family and caregiver about fecal impaction, overflow incontinence, and need for long-term laxative therapy Start PEG (eg, Miralax, Glycolax, Pegalax) 1 g/kg once daily, given in the morning <sup>¶</sup>	Educate family (as in column A) Start PEG 1 to 1.5 g/kg daily, divided into 2 doses <sup>¶</sup>
Day 2 to 3	Continue PEG once daily	Continue PEG twice daily
Day 4 to 6	If the child is beginning to pass 1 to 2 soft to loose stools daily, continue above dose of PEG If the child is not passing soft to loose stools, increase the PEG dose to 1.5 g/kg, divided into 2 doses; soiling should gradually decrease and stop Establish regular toileting patterns by having the child sit on the toilet for 5 to 10 minutes, 2 to 3 times daily after meals	If the child has not passed a large amount of stool, give sodium phosphate enema <sup>Δ</sup> (eg, Fleet enema) 33 to 66 mL, depending on the size of the child Continue twice-daily dosing of PEG for up to 6 days total, until the child has passed a large amount of stool Once the child is having soft stools at least once daily, reduce PEG to 1 g/kg, given once daily in the morning Establish regular toileting patterns (as described in column A)
Day 7 to 30	Be sure the parent calls if not making progress, so further adjustments in PEG dose can be made Occasionally, it is necessary to increase PEG to twice-daily dosing	
1 month	Return office visit to evaluate progress and reinforce need for regular laxative therapy Provide handout or references for fiber-rich diet, and have family work to increase fiber content of diet for long-term maintenance	
1 to 6 months	Return office visit every 1 to 2 months to reinforce therapy and adjust dose of laxative if necessary	
6 to 12 months (or longer)	Once the child is maintaining normal bowel movements without soiling for several months, consider gradually tapering laxative over 2 months Be sure the child is on a fiber-rich diet and is taking sufficient fluids Some children require ongoing laxative treatment for 1 or more years	
Beyond 12 months	Follow as long as it takes for resolution; it can be months to several years before encopresis resolves completely	





### How the treatment works

#### Before treatment

- The child may avoid pooping because they have felt pain while pooping
- Hard stool builds up in the rectum
- Nerves and muscles in the rectum and anus get stretched and don't work as well
- Sometimes, soft or liquid stool might move around the hard stool and leak out

#### After treatment

- The child learns they can avoid pain by having bowel movements frequently
- There are only small amounts of stool in the rectum, and the stool is soft
- The nerves in the decompressed rectum and anus work better, so the child can sense when they need to go
- The muscles in the rectum are stronger and can push the stool out
- No leaking because there is no buildup of hard stool, and the anal sphincter works better

# Constipation in children

- Disimpaction (for children with a large rectal stool mass or fecal incontinence)
- Prolonged laxative treatment and behavioral therapy to achieve regular evacuation and avoid recurrent constipation
- Dietary changes (primarily increasing fiber and fluid content) to maintain soft stools
- Gradual tapering and withdrawal of laxatives as tolerated

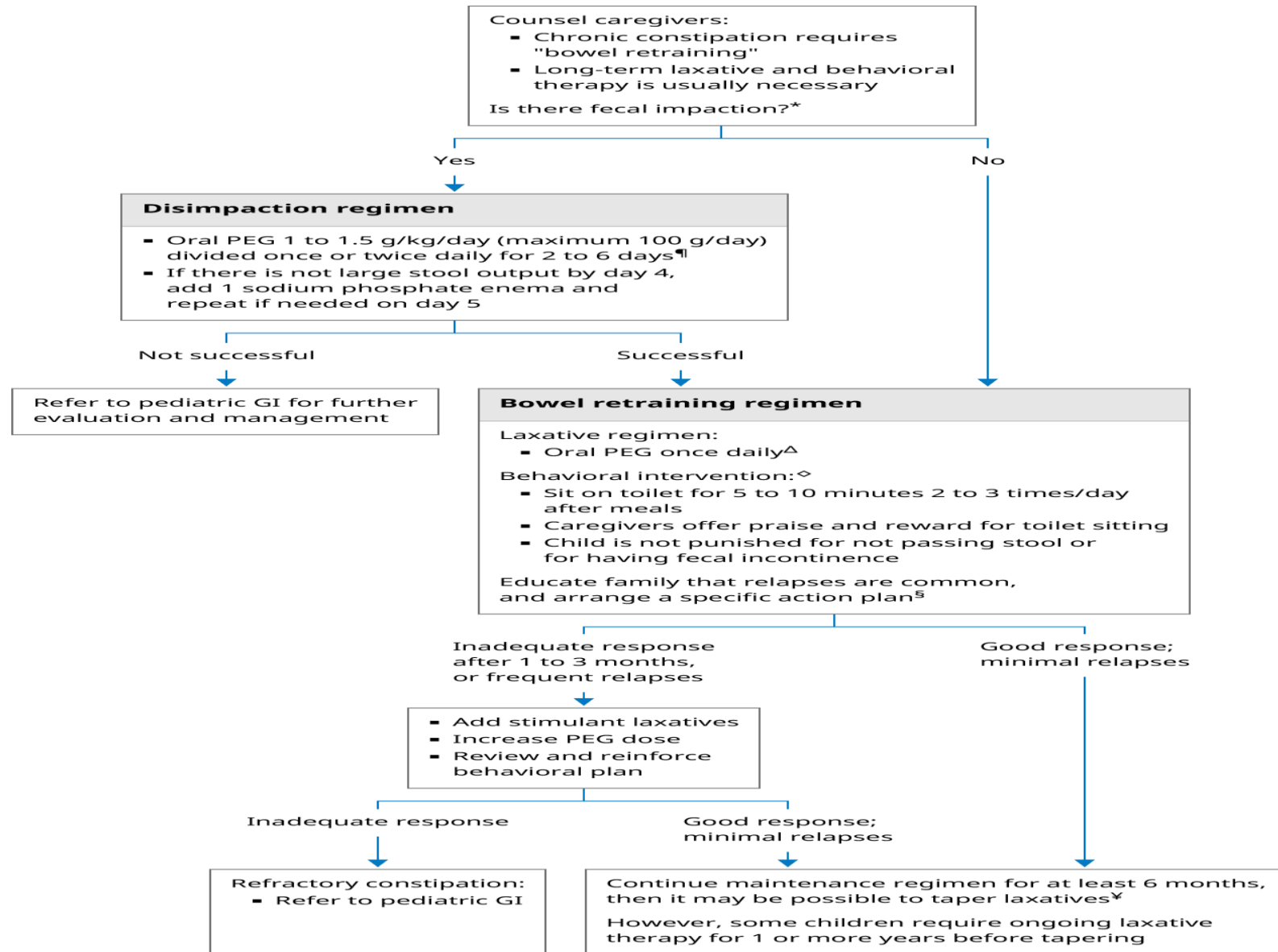


# REFRACTORY CONSTIPATION

**TABLE 2** Diagnostic criteria for refractory constipation in children (all four criteria must be present).

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1. Must meet ROME IV criteria for functional constipation
  2. Failure of age and developmentally appropriate conventional therapies to improve symptoms after a minimum of 3 months on the following therapies
    - a. Daily use of a stimulant laxative at appropriate dosage (see Table 3 for dosing recommendations) regardless of osmotic laxative use
    - b. Behavioral interventions
    - c. Biomechanical interventions (i.e., correct positioning on the toilet)
  3. Ongoing symptoms of constipation
    - a.  $\leq 2$  voluntary defecations per week  
and/or
    - b.  $\geq 1$  episode of fecal incontinence per week
  4. Impaired QoL for the patient or family due to constipation symptoms
-



# Disimpaction regimens

- ▶ Outpatients
- ▶ Inpatients
- ▶ Per oral(PEG)
- ▶ Per rectal(BISACODIL-GLYCERIN- PHOSPHAT ENEMA)
- ▶ Oral and rectal medications
- ▶ Pulsed irrigation enhanced-evacuation systems

# Maintenance laxative therapy

## Typical regimen for a child with recurrent or chronic constipation without fecal impaction or incontinence

<b>Step 1</b>	Start 2 to 4 teaspoons (4.5 teaspoons = 17 g) of PEG 3350 (eg, MiraLax, GlycoLax) once daily in 4 to 8 ounces (120 to 240 mL) of noncarbonated beverage (or appropriate dose of another laxative). Dietary counseling to add dietary fiber and extra liquids to the diet each day.
<b>Step 2</b>	Increase or decrease PEG 3350 by 1 to 2 teaspoons every 2 to 3 days, until the desired result of daily soft stools is achieved. Maximum dose is 1 heaping tablespoon (17 g) twice daily.
<b>Step 3</b>	Follow-up by phone or a return visit within 1 month to be sure the laxative is effective.
<b>Step 4</b>	Continue to add dietary fiber and extra liquids to the diet each day.
<b>Step 5</b>	After 6 to 8 weeks of soft daily bowel movements, begin to taper the dose of PEG 3350 by 0.5 to 1 teaspoon every 2 weeks, until daily movements continue without the need for a laxative.
<b>Step 6</b>	If stools become hard again, increase the dose slightly and retry weaning off the laxative in another 6 to 8 weeks.
<b>Step 7</b>	This process may take from 2 to 4 weeks to 6 months, but the end result should be resolution of the constipation.

# TREATMENT OF CHILDREN

- ▶ Parental education
- ▶ Drugs
  - disimpaction
  - maintenance therapy
- ▶ Diet
- ▶ Toileting
- ▶ Behavioral changes
- ▶ Follow up













### Typical regimen for a child with recurrent or chronic constipation without fecal impaction or incontinence

<b>Step 1</b>	Start 2 to 4 teaspoons (4.5 teaspoons = 17 g) of PEG 3350 (eg, MiraLax, GlycoLax) once daily in 4 to 8 ounces (120 to 240 mL) of noncarbonated beverage (or appropriate dose of another laxative). Dietary counseling to add dietary fiber and extra liquids to the diet each day.
<b>Step 2</b>	Increase or decrease PEG 3350 by 1 to 2 teaspoons every 2 to 3 days, until the desired result of daily soft stools is achieved. Maximum dose is 1 heaping tablespoon (17 g) twice daily.
<b>Step 3</b>	Follow-up by phone or a return visit within 1 month to be sure the laxative is effective.
<b>Step 4</b>	Continue to add dietary fiber and extra liquids to the diet each day.
<b>Step 5</b>	After 6 to 8 weeks of soft daily bowel movements, begin to taper the dose of PEG 3350 by 0.5 to 1 teaspoon every 2 weeks, until daily movements continue without the need for a laxative.
<b>Step 6</b>	If stools become hard again, increase the dose slightly and retry weaning off the laxative in another 6 to 8 weeks.
<b>Step 7</b>	This process may take from 2 to 4 weeks to 6 months, but the end result should be resolution of the constipation.

# Constipation in children

- ▶ Fecal disimpaction
- ▶ Maintenance therapy

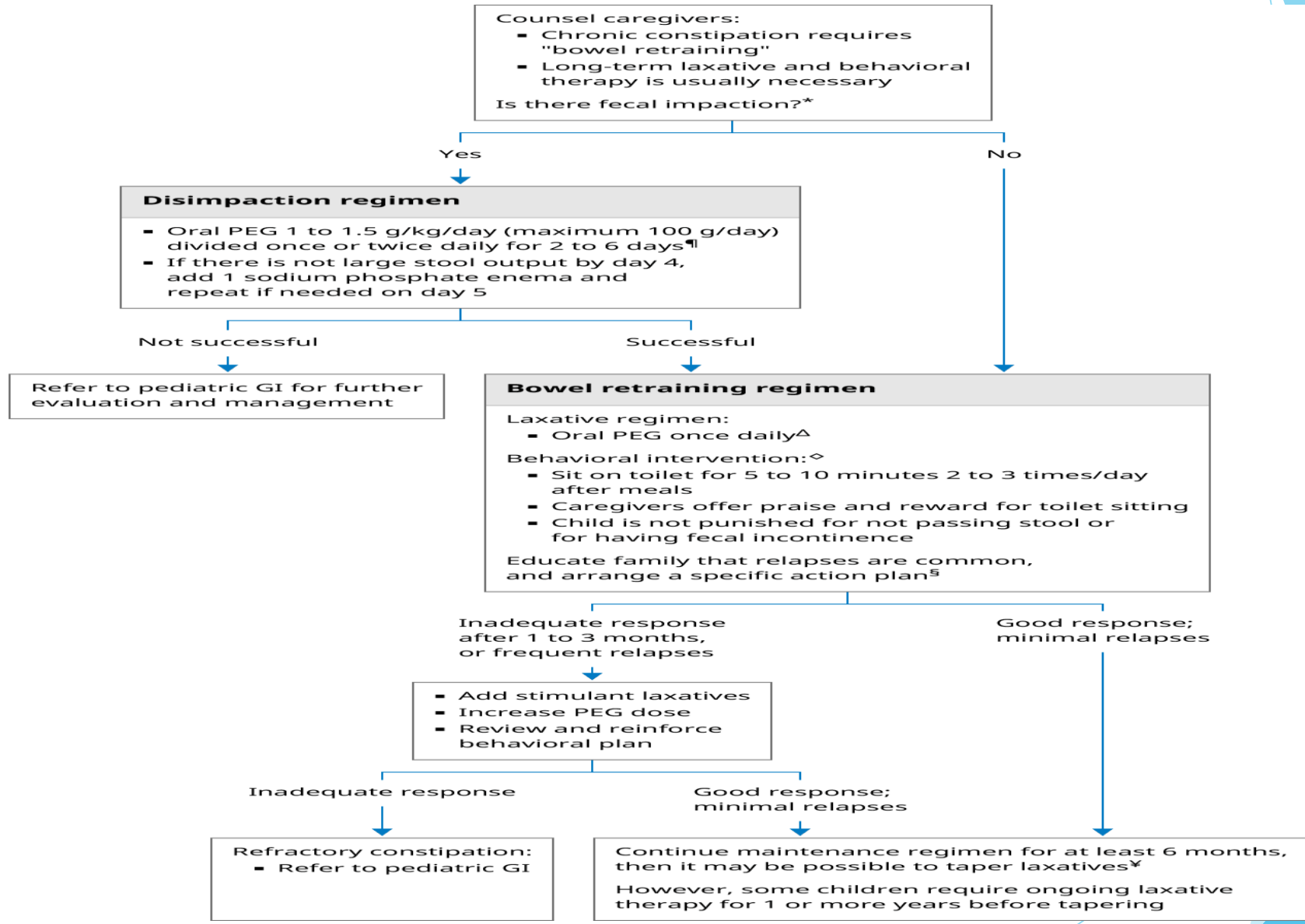
# fecal incontinence treatment

	<b>Small fecal impaction (oral medications)</b>	<b>Large fecal impaction (oral and rectal medication)</b>
Day 1	Educate the family and caregiver about fecal impaction, overflow incontinence, and need for long-term laxative therapy Start PEG (eg, Miralax, Glycolax, Pegalax) 1 g/kg once daily, given in the morning <sup>¶</sup>	Educate family (as in column A) Start PEG 1 to 1.5 g/kg daily, divided into 2 doses <sup>¶</sup>
Day 2 to 3	Continue PEG once daily	Continue PEG twice daily
Day 4 to 6	If the child is beginning to pass 1 to 2 soft to loose stools daily, continue above dose of PEG If the child is not passing soft to loose stools, increase the PEG dose to 1.5 g/kg, divided into 2 doses; soiling should gradually decrease and stop Establish regular toileting patterns by having the child sit on the toilet for 5 to 10 minutes, 2 to 3 times daily after meals	If the child has not passed a large amount of stool, give sodium phosphate enema <sup>Δ</sup> (eg, Fleet enema) 33 to 66 mL, depending on the size of the child Continue twice-daily dosing of PEG for up to 6 days total, until the child has passed a large amount of stool Once the child is having soft stools at least once daily, reduce PEG to 1 g/kg, given once daily in the morning Establish regular toileting patterns (as described in column A)
Day 7 to 30	Be sure the parent calls if not making progress, so further adjustments in PEG dose can be made Occasionally, it is necessary to increase PEG to twice-daily dosing	
1 month	Return office visit to evaluate progress and reinforce need for regular laxative therapy Provide handout or references for fiber-rich diet, and have family work to increase fiber content of diet for long-term maintenance	
1 to 6 months	Return office visit every 1 to 2 months to reinforce therapy and adjust dose of laxative if necessary	
6 to 12 months (or longer)	Once the child is maintaining normal bowel movements without soiling for several months, consider gradually tapering laxative over 2 months Be sure the child is on a fiber-rich diet and is taking sufficient fluids Some children require ongoing laxative treatment for 1 or more years	
Beyond 12 months	Follow as long as it takes for resolution; it can be months to several years before encopresis resolves completely	

# Typical regimen for a child with recurrent or chronic constipation without fecal impaction or incontinence

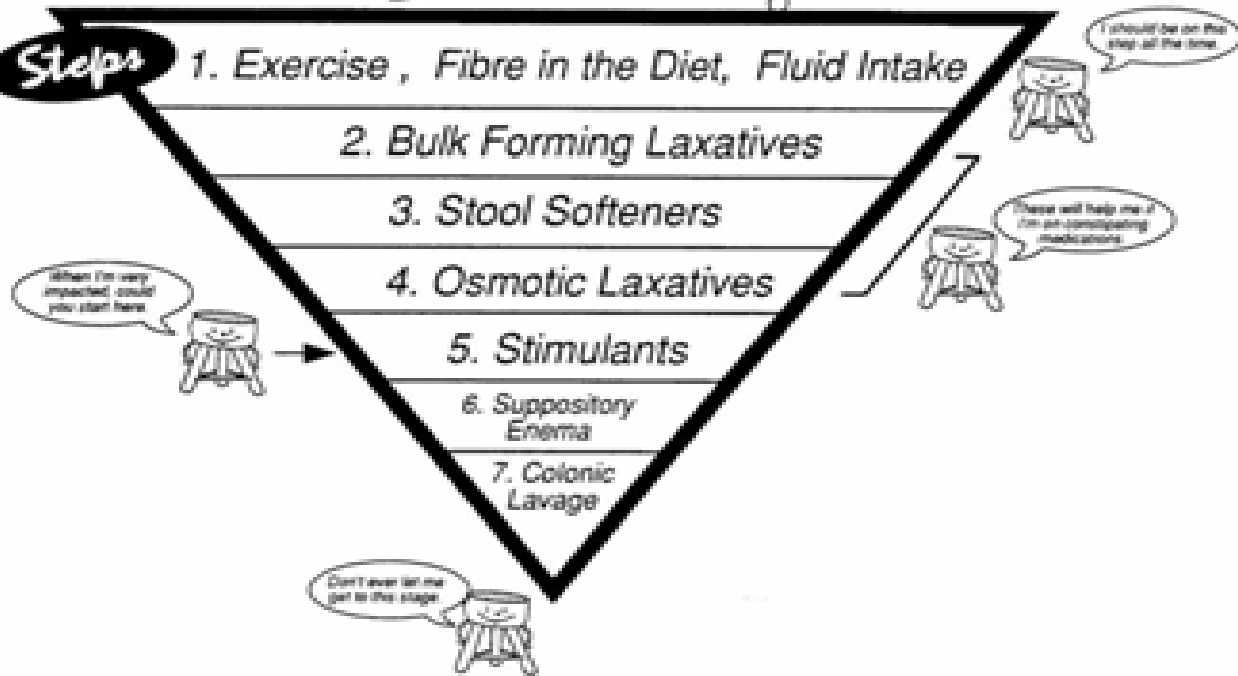
## Typical regimen for a child with recurrent or chronic constipation without fecal impaction or incontinence

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<b>Step 7</b>	This process may take from 2 to 4 weeks to 6 months, but the end result should be resolution of the constipation.



# STEPPING OUT OF CONSTIPATION

with Mr Stool



# REFRACTORY CONSTIPATION

## Other interventions for selected patients

- ▶ Pelvic floor physical therapy((with or without biofeedback therapy)
- ▶ Anal sphincter release (botulinum toxin injection or anal sphincter myectomy)
  - ▶ Patients with IAS achalasia
  - ▶ Patients with refractory idiopathic functional constipation

# drugs

- 1) **Osmotic**(lactulose-PEG-MOM-sorbitol)
- 2) Lubricants(paraffin-mineral oil- glycerin)
- 3) Stool softener( sodium docusate)
- 4) Bulking agents(psyllium)
- 5) **Stimulants**(senna-bisacodil)
- 6) Prokinetics( cisapride)
- 7) linaclotide, lubiprostone, prucalopride ,plecanatide
- 8) Tegaserod

# REFRACTORY CONSTIPATION

- ▶ RC is defined by the presence of ongoing constipation symptoms in children who meet Rome IV criteria for pediatric FC, and who have had failure to improve after a minimum of 3 months usage of age- and developmentally appropriate conventional constipation therapies, and in whom there is impaired QoL.
- ▶ Ongoing symptoms are defined by  $\leq 2$  voluntary defecations per week and/or  $\geq 1$  episode of fecal incontinence per week.
- ▶ Conventional constipation therapies should include the use of daily stimulant laxatives at appropriate dosages in addition to behavioral and biomechanical interventions

# REFRACTORY CONSTIPATION

- ▶ ARM should be used to screen for the presence of a RAIR.
  - ▶ If anal spasms and prolonged sphincter relaxation are detected during ARM, an assessment for spinal abnormalities can be considered.
- ▶ **CM should be used** to guide the timing and type of surgery to address RC.
- ▶ **CM should be used** to guide when to perform an ostomy takedown.
- ▶ Rectal biopsies **should not be used routinely** in patients with RC and are indicated exclusively in patients with a suspected diagnosis of HD.
- ▶ A CE can be used to screen for HD or to assess colorectal anatomy.
- ▶ In pediatric patients with significant abdominal distension, a CE can be used to assess the colonic caliber before surgical intervention.

# REFRACTORY CONSTIPATION

## evaluation

- ▶ celiac disease
- ▶ thyroid disease
- ▶ Ab xray?
- ▶ **Anorectal manometry and/or balloon expulsion testing**
- ▶ **Colon transit studies**
- ▶ **Colon manometry**
- ▶ Defecography
- ▶ LSMRI
- ▶ Contrast enema
- ▶ Transabdominal ultrasonography
- ▶ Wireless motility capsule
- ▶ Rectal biopsy

# REFRACTORY CONSTIPATION

**TABLE 3** Dosages of frequently used pharmaceuticals in the treatment of pediatric refractory constipation.

<b>Medication</b>	<b>Formulation</b>	<b>Dosing</b>
<b>Stimulant laxatives</b>		
Sennosides <sup>a</sup>	Chew tablet	1–2 mg/kg qHS, max 120 mg
	Gummy	
	Liquid	
	Tablet	
Bisacodyl	Tablet	0.2 mg/kg qHS, max 20 mg
	Compounded Enema/ suppository	5–10 mg (0.5–1 enema or suppository) qday or BID
<b>Secretagogues</b>		
Linaclootide <sup>b</sup>	Tablet	72, 145, or 290 µg qday Take on an empty stomach, 30 min before the first meal of the day
Plecanatide <sup>c,d</sup>	Tablet	3 mg qday
Lubiprostone <sup>d</sup>	Capsule	8, 16, or 24 µg BID Take with food
<b>Serotonin agonists</b>		
Prucalopride <sup>e</sup>	Liquid	0.02–0.04 mg/kg, max 2 mg qday
	Tablet	

# REFRACTORY CONSTIPATION

## evaluation

- ▶ Pediatric patients with RC should be screened for thyroid disease if there is a red flag present for before performing an invasive test or surgical intervention.
- ▶ The use of an **AXR** in RC should be reserved for those patients unable to provide a reliable medical history and/or unable to allow for a physical exam (including a DRE), or to evaluate for mechanical obstruction or colonic distention when considering surgical interventions.

