



The background is a solid blue gradient. Scattered across the background are numerous white butterfly silhouettes of various sizes and orientations, creating a decorative pattern.

CONSTIPATION AND FECAL INCONTINENCE

PATHOPHYSIOLOGY

- genetic predisposition,
- environmental factors,
- life stress,
- psychologic state,
- coping,
- social support, and
- interactions between physiologic and psychological factors

The background of the slide is a solid blue gradient. Scattered across this background are numerous white butterfly silhouettes of various sizes and orientations, creating a decorative border effect around the central text.

FUNCTIONAL CONSTIPATION IN INFANTS AND TODDLERS

TABLE 12-1. The Rome III Criteria for Functional Constipation in Neonates and Toddlers

Diagnostic Criteria for Functional Constipation in Neonates and Toddlers⁹

At least 2 of the following symptoms must occur for at least 1 month:

- <2 defecations per week

- >1 episode per week of incontinence after the acquisition of toileting skills

- History of excessive stool retention

- History of painful or hard bowel movements

- Presence of a large fecal mass in the rectum, and

- History of large-diameter stools that may obstruct the toilet



FUNCTIONAL CONSTIPATION IN CHILDREN AND ADOLESCENTS

TABLE 12-2. The Rome III Criteria for Functional Constipation in Children and Adolescents

Diagnostic Criteria for Functional Constipation in Children and Adolescents¹⁰

Symptom must occur at least once per week for at least 2 months and include 2 or more of the following in a child with a developmental age of >4 years with insufficient criteria for diagnosis of irritable bowel syndrome:

- Two or fewer defecations in the toilet per week

- At least 1 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 that may obstruct the toilet

COMPLICATIONS OF CONSTIPATION

TABLE 12-3. Complications of Constipation

Fecal incontinence

Pain:

- Abdominal pain

- Anal or rectal pain

Anorexia

Urinary complications:

- Daytime urinary incontinence

- Nighttime urinary incontinence

- Urinary tract infection

- Vesicoureteral reflux

- Urinary retention

- Megacystis

- Ureteral obstruction

Rarely, life-threatening events such as shock or toxic megacolon

Social exclusion by siblings, parents, peers, and teachers

TABLE 12-4. Clinical Features of Constipation With Fecal Incontinence

- Difficulties with defecation began early in life, in 50% of children before 1 year of age
- Passage of enormous stools
- Obstruction of the toilet by stool
- Symptoms due to the increasing accumulation of stool:
 - Retentive posturing
 - Fecal incontinence
 - Abdominal pain and irritability, anal or rectal pain
 - Anorexia
 - Urinary symptoms:
 - Daytime urinary incontinence
 - Nighttime urinary incontinence
 - Urinary tract infection
- Unusual behaviors in an effort to cope with the fecal incontinence:
 - Nonchalant attitude regarding the fecal incontinence
 - Hiding of dirty underwear
 - Lack of awareness of an incontinence episode
- Dramatic disappearance of most symptoms following the passage of a huge stool

FUNCTIONAL FECAL INCONTINENCE

- Constipation-Associated Fecal Incontinence
- Functional Nonretentive Fecal Incontinence

TABLE 12-5. The Rome III Criteria for Functional Nonretentive Fecal Incontinence

Diagnostic Criteria for Functional Non-Retentive Fecal Incontinence¹⁰

Once a week or more for the preceding 2 months in a child of a developmental age > 4 years, a history of:

Defecation into places inappropriate to the social context

No evidence of an inflammatory, anatomic, metabolic or neoplastic process considered likely to be an explanation for the subject's symptoms

No evidence of fecal retention

INVESTIGATIONS

- History
- Physical Examination
- Laboratory Investigation

TABLE 12-6. Important Information to Elicit by History and Physical Examination

History	Physical Examination
Complete with special attention to: Stooling habits: Character of stools in toilet Character of stools in underwear Stool withholding maneuvers Age of onset of constipation/ fecal incontinence Abdominal pain Urinary symptoms: Day wetting Bed wetting Urinary tract infections Dietary habits	Complete with special attention to: Abdominal examination Anal inspection Rectal digital examination Neurologic examination, including perianal sensation testing

Laboratory Investigation

- T₃, T₄, TSH, Na/K, Ca/P, Adrenal, Anti TTG, EMA, U/C
- Occult Blood Testing
- Abdominal Radiographs
- Barium Enema Study
- Colonic Transit Study
- Anorectal Manometry
- Colonic Motility Study

TREATMENT

- Functional Constipation in Infants and Toddlers
 - Educate the parents
 - Diet and Fiber
 - Laxative
- Functional Constipation With and Without Fecal Incontinence in Children and Adolescents
 - Education
 - Disimpaction
 - Prevention of Reaccumulation of Stools (Maintenance Therapy)
 - Withdrawal of the treatment

TABLE 12-7. Suggested Medications and Dosages for Maintenance Therapy of Constipation

Medication	Age	Dose
For Long-Term Treatment (Years):		
Polyethylene glycol		
3350 (MiraLax)	>1 month	$1 \text{ gr/kg} = 1 \text{ cc/kg}$ 0.7 g/kg body weight/day ^{16,30} or 0.4 g/kg body weight/day ⁵⁴
3350+electrolytes (Movicol)		13.8-40 g/day ^{40,41}
4000 (Forlax)	>6 months	0.5 g/kg body weight/day ⁴³ $1 \text{ gr} = 3 \text{ cc}$
Lactulose or sorbitol	>1 months	1-3 mL/kg body weight/day, divide in 1-2 doses
Milk of magnesia	>1 month	1-3 mL/kg body weight/day, divide in 1-2 doses
Mineral oil	>12 months	1-3 mL/kg body weight/d, divided in 1-2 doses
For Short-Term Treatment (Months):		
Senna (Senokot) syrup/tablets	1-5 years	5 mL (1 tab) with breakfast, max. 15 mL/d
	5-15 years	2 tablets with breakfast, maximum 3 tablets/d
Glycerin enemas	> 10 years	20-30 mL/day (1/2 glycerin and 1/2 normal saline)
Bisacodyl suppositories	>10 years	10 mg daily

TABLE 12-8. Suggested Medications for Fecal Disimpaction

Medication	Age	Dose
<i>Slow Oral Disimpaction</i>		
Polyethylene 3350 without electrolytes (for 3 days) ⁴²		1.5 g/kg body weight/day 10 cc/kg
Polyethylene 3350 with electrolytes (for 6 days) ⁴¹	2- to 4-year-olds	52 g/day
	5- to 11-year-olds	78 g/day
Milk of magnesia (for 7 days)		2 mL/kg body weight twice/day
Mineral oil (for 7 days)		3 mL/kg body weight twice/day
Lactulose or sorbitol (7 days)		2 mL/kg body weight twice/day
<i>Rapid Rectal Disimpaction</i>		
Glycerin suppositories	Infants and toddlers	
Phosphate enema	<1 year	60 mL
	>1 year	6 mL/kg body weight, up to 135 mL twice

● قاشق اندازه‌گیری به قاشق‌هایی گفته می‌شود که در هنگام آشپزی برای اندازه‌گیری مقادیر کم مواد غذایی بخصوص چاشنی غذا به کار می‌روند. جنس این قاشق‌ها از پلاستیک یا فلز است.

● ۱. در صورتی که سری قاشق شش‌تایی باشد، بزرگترین قاشق یا قاشق غذاخوری علامت اختصاری TBS آن گنجایش ۱۵ میلی‌لیتر را دارد.

● ۲. از نظر بزرگی قاشق دوم، یا قاشق یک دوم غذاخوری گنجایش ۷ و نیم میلی‌لیتر را دارد.

● ۳. از نظر بزرگی قاشق سوم، یا قاشق چایخوری علامت اختصاری TSP گنجایش ۵ میلی‌لیتر را دارد.

● ۴. از نظر بزرگی قاشق چهارم، یا قاشق یک دوم چایخوری گنجایش ۲ و نیم میلی‌لیتر را دارد.

● ۵. از نظر بزرگی قاشق پنجم، یا قاشق یک چهارم چایخوری نصف قاشق چهارم گنجایش دارد.

● ۶. از نظر بزرگی قاشق ششم، یا قاشق یک هشتم چایخوری نصف قاشق پنجم گنجایش دارد.

● این قاشق‌ها برای اندازه‌گیری گرم نیست زیرا وزن مواد مختلف با وجود حجم یکسان با یکدیگر متفاوت است.



Prevention of Reaccumulation of Stools (Maintenance Therapy)

- Behavior Modification
- Fiber
- Laxatives
- Psychological Treatment

TABLE 7. Medications for use in treatment of constipation

Laxatives	Dosage	Side effects	Notes
Osmotic			
Lactulose ^a	1–3 mL/kg/day in divided doses; available as 70% solution.	Flatulence, abdominal cramps; hypernatremia has been reported when used in high dosage for hepatic encephalopathy; case reports of nontoxic megacolon in elderly.	Synthetic disaccharide. Well tolerated long term.
Sorbitol ^a	1–3 mL/kg/day in divided doses; available as 70% solution.	Same as lactulose.	Less expensive than lactulose.
Barley malt extract ^a	2–10 mL/240 mL of milk or juice		Unpleasant odor. Suitable for infants drinking from a bottle.
Magnesium hydroxide ^a	1–3 mL/kg/day of 400 mg/5 mL; available as liquid, 400 mg/5 mL and 800 mg/5 mL, and tablets.	Infants are susceptible to magnesium poisoning. Overdose can lead to hypermagnesemia, hypophosphatemia and secondary hypocalcemia.	Acts as an osmotic laxative. Releases cholecystokinin, which stimulates gastrointestinal secretion and motility. Use with caution in renal impairment.
Magnesium citrate ^a	<6 Years, 1–3 mL/kg/day; 6–12 years, 100–150 mL/day; >12 years, 150–300 mL/day; in single or divided doses. Available as liquid, 16.17% magnesium.	Infants are susceptible to magnesium poisoning. Overdose can lead to hypermagnesemia, hypophosphatemia and secondary hypocalcemia.	
PEG 3350	Disimpaction: 1–1.5 g/kg/day for 3 days Maintenance 1 g/kg/day		Superior palatability and acceptance by children Safety studies necessary before widespread use is recommended in infants.
Osmotic enema			
Phosphate enemas	<2 Years old: to be avoided; ≥2 years old: 6 mL/kg up to	Risk of mechanical trauma to rectal wall, abdominal distention or vomiting. May	Some of the anion is absorbed, but if kidney is normal, no toxic

Lavage			
Polyethylene glycol-electrolyte solution	For disimpaction: 25 mL/kg/hr (to 1000 mL/hr) by nasogastric tube until clear or 20 mL/kg/hr for 4 hr/day. For maintenance: (older children): 5–10 mL/kg/per day.	Difficult to take. Nausea, bloating, abdominal cramps, vomiting, and anal irritation. Aspiration, pneumonia, pulmonary edema, Mallory–Weiss tear. Safety of long-term maintenance not well established.	Information mostly obtained from use for total colonic irrigation. May require hospital admission and nasogastric tube.
Lubricant			
Mineral oil ^a	<1 Year old; not recommended. Disimpaction: 15–30 mL/yr of age, up to 240 mL daily. Maintenance: 1–3 mL/kg/day.	Lipoid pneumonia if aspirated. Theoretical interference with absorption of fat-soluble substances, but there is no evidence in the literature. Foreign-body reaction in intestinal mucosa.	Softens stool and decreases water absorption. More palatable if chilled. Anal leakage indicates dose too high or need for clean-out.
Stimulants		Abdominal pain, cathartic colon (possibility of permanent gut, nerve, or muscle damage).	Increased intestinal motility.
Senna	2–6 years old: 2.5–7.5 mL/day; 6–12 years old: 5–15 mL/day. Available as syrup, 8.8 mg of sennosides/5 mL. Also available as granules and tablets.	Idiosyncratic hepatitis, Melanosis coli, Hypertrophic osteoarthropathy, analgesic nephropathy.	Melanosis coli improves 4–12 mo after medications discontinued.
Bisacodyl	≥2 Years old: 0.5–1 suppository 1–3 tablets per dose. Available in 5-mg tablets and 10-mg suppositories.	Abdominal pain, diarrhea and hypokalemia, abnormal rectal mucosa, and (rarely) proctitis. Case reports of urolithiasis.	
Glycerin suppositories		No side effects.	

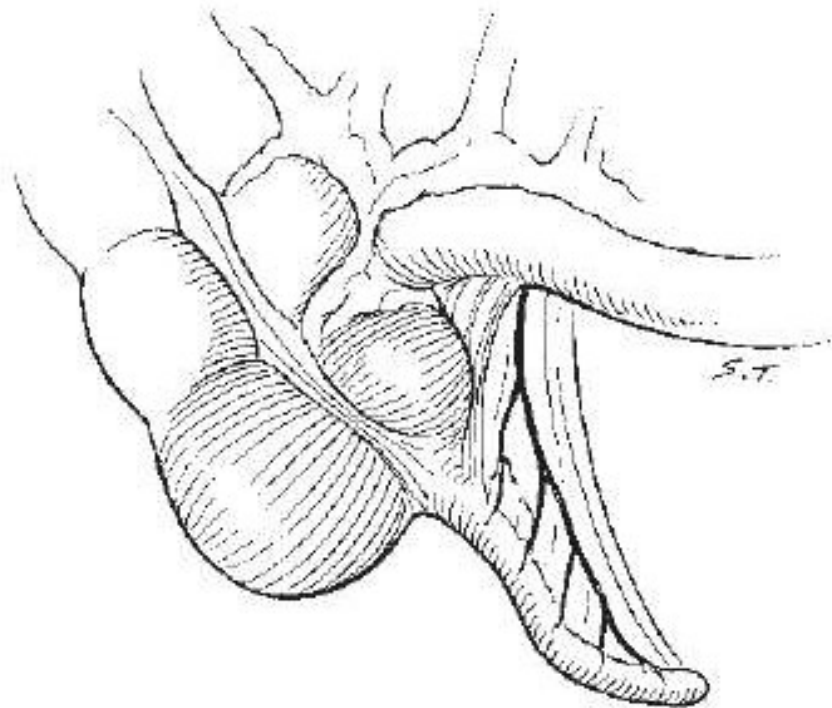
The background of the slide is a solid blue color with a subtle gradient. Scattered across the background are numerous white butterfly silhouettes of various sizes and orientations, creating a decorative and serene atmosphere.

Follow-up Visits and Weaning From Medication

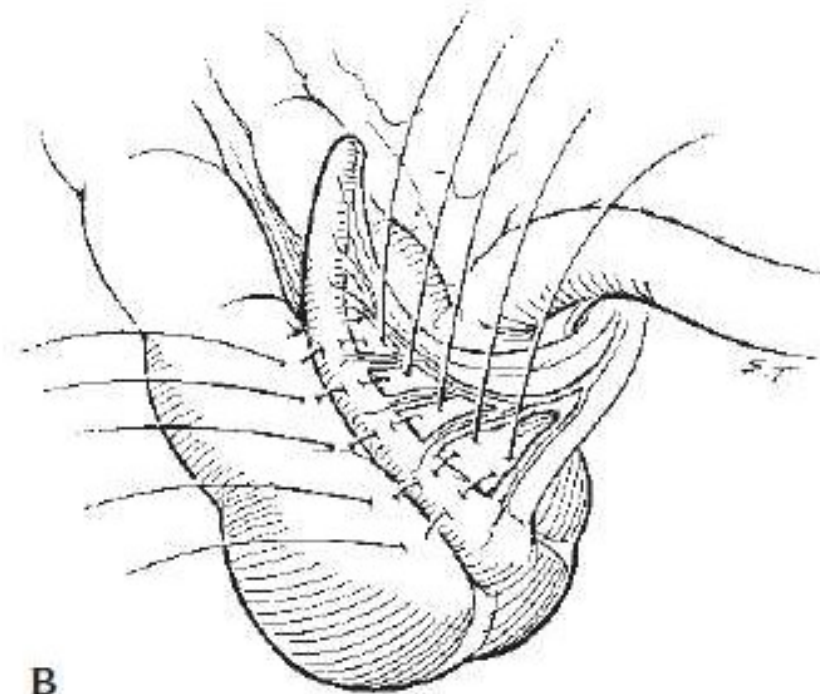
What Can Go Wrong in the Treatment?



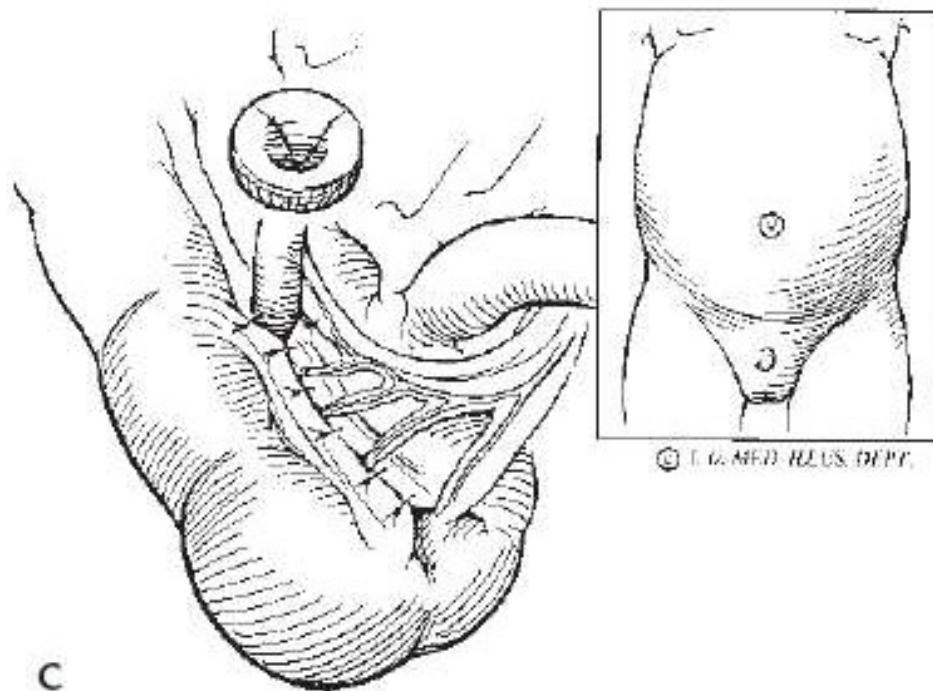
Treatment of Nonretentive Fecal Incontinence



A



B



C

FIGURE 46.1-8 A, Anatomy of the cecum and appendix. B, The cecum is wrapped around the appendix to create a nonrefluxing appendicocoececostomy. C, A nonrefluxing appendicocoececostomy ready for antegrade enemas. Courtesy of Drs. Anthony Casale and Richard Rink, James Whitcomb Riley Hospital for Children, Indianapolis, Indiana.

Surgical Treatment

- Anorectal myectomy
- Proctocolectomy
- The Malone appendicocostomy for antegrade colonic enemas (MACE procedure)
- Colectomy
- Hemicolectomy
- Ileostomy