Indian Academy of Pediatrics (IAP)

NATIONAL TREATMENT GUIDELINES

Constipation

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23 Constipation

INTRODUCTION

Childhood constipation, a common and distressing condition is responsible for 3% of visits to primary care physicians.[1,2] Indian data regarding emergency department (ED) visits is limited. Western data show about 2% of children presenting to the ED have constipation, and 14.5% of children with constipation require an ED visit.[3,4] Overall, etiology is mostly functional; only 5% of children have organic causes. Life-threatening causes of constipation are rare, and can sometimes mimic other common emergencies. Awareness is essential for prompt recognition and emergency management, and timely referral when indicated. A focused history and meticulous examination and awareness of red flag signs to recognize organic or life-threatening causes are essential in the ED. Appropriate outpatient counseling and management can prevent many ED visits, as the latter is associated with overutilization of investigations and burdening of resources.[5,6]

DEFINITION

Normal stool habits, depending on age, diet, and other factors, are variable. Therefore, a single definition for constipation may not be uniformly applicable. Constipation lasting >4 weeks is called chronic constipation and has objective criteria **(Box 1)**. Constipation <4 weeks, i.e., acute constipation, may be simply defined as any recent problem with defecation—delayed or infrequent passage, hard stools, pain, excessive straining, incomplete evacuation, involuntary soiling, or inability to pass stool at all.[7]

BOX 1: Criteria for diagnosis of chronic constipation in Indian children.[2]

More than or equal to 2 of the following occurring at least once per week for *>4 weeks*:

- Defecation frequency ≤2 times per week
- Fecal incontinence ≥1 time per week after the acquisition of toileting skills
- History of excessive stool retention
- History of painful or hard bowel movements
- Presence of a large mass in the rectum or on per abdomen examination
- History of large-diameter stools that may obstruct the toilet (this may not be elicitable for the majority of Indian children who do not use the Western type of toilet)

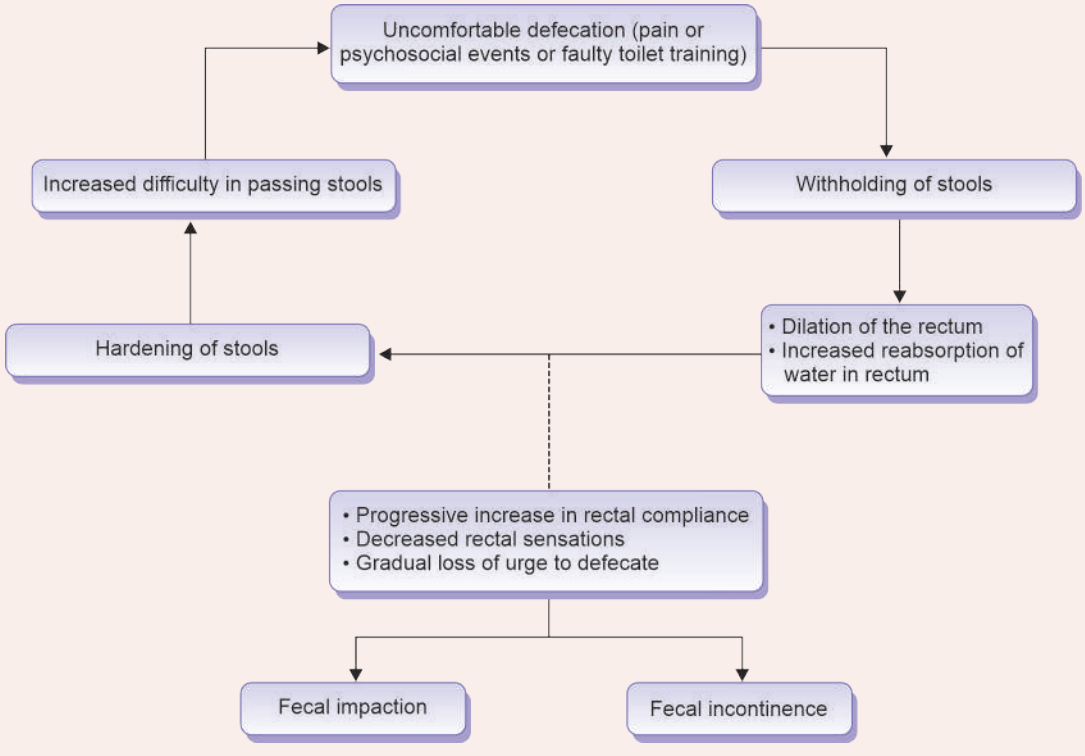
ETIOPATHOGENESIS

The etiology of constipation is enlisted in **Box 2**, and the pathogenesis is depicted in **Flowchart 1**.

BOX 2: Causes of constipation.

- *Surgical causes:*
  - Hirschsprung disease
  - Anorectal malformations (imperforate anus, anal stenosis, anteriorly placed rectum)
  - Intestinal obstructions
- *Neurological disorders:*
  - Spinal cord abnormalities (e.g., spina bifida, tethered cord, spinal cord injuries, tumors)
  - Autonomic neuropathy
- *Metabolic abnormalities:*
  - Hypothyroidism
  - Hypercalcemia
  - Hypokalemia
  - Diabetes mellitus
- *Gastrointestinal disorders:*
  - Cystic fibrosis
  - Inflammatory bowel disease (IBD) (e.g., Crohn's disease, ulcerative colitis)
  - Celiac disease
- *Dietary factors:* Cow's milk protein allergy
- *Toxic and medication-induced:*
  - Lead poisoning
  - Medications (e.g., opioids, anticholinergics, iron supplements)
- *Functional constipation*

Flowchart 1: Pathogenesis of constipation.



CLINICAL FEATURES

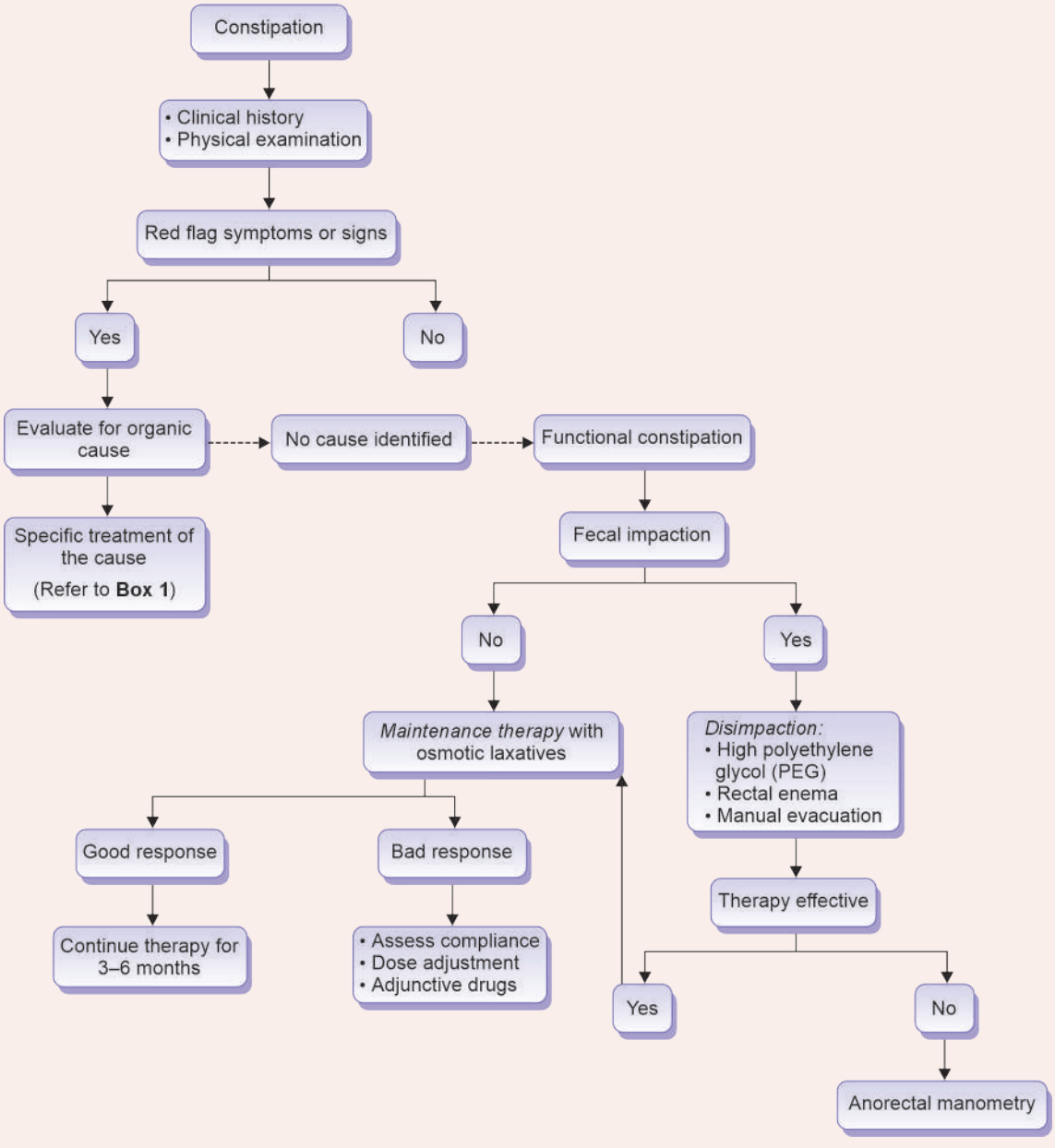
Children can present to the ED with one or more of the following:

- *Infrequent bowel movements:* Fewer than three bowel movements per week
- *Passage of hard stools:* Pictorial tools like the modified Bristol Stool Form chart can be used for assessment
- *Painful defecation:* Pain or discomfort during bowel movements
- *Straining:* Excessive effort needed to pass stools
- *Incomplete evacuation:* Feeling of incomplete bowel emptying after defecation
- Abdominal pain
- *Rectal bleeding:* Blood on the surface of stools or toilet paper, often due to anal fissures
- Fecal incontinence/encopresis in children ≥4 years or those who had previously attained bowel control

EVALUATION (FLOWCHART 2)

- Though constipation is a symptom of a disease, rather than a disease itself, evaluation, definitive diagnosis, and comprehensive management are not the purview of the ED physician. Hence, evaluation should focus on recognition of serious conditions requiring emergent management and/or relief of acute complications.
- Common conditions encountered include recent viral illnesses with dehydration, or adynamic ileus following gastroenteritis, leading to acute constipation. Anal fissures and diaper rash can lead to painful defecation and precipitate stool retention. Lead poisoning and infantile botulism are less common but serious causes.
- Recent onset of constipation associated with abdominal pain, distension, and vomiting may be suggestive of intestinal obstruction. Other than the symptoms enlisted above, use of medications or prior treatment taken for constipation, dietary habits, and family and social history regarding stressful events at home or school-related issues should be enquired.
- A thorough physical examination is essential and provides not only diagnostic clues regarding the cause, but more importantly can uncover the red flag signs, which determine further decisions in the ED. Failure to thrive suggests chronicity and underlying organic etiology. Abdominal examination should focus on identifying abdominal distension seen in surgical causes like Hirschsprung disease or intestinal obstruction, palpable fecoliths, other palpable masses or organomegaly, and features of peritonitis. Perianal area should be examined for the position of the anus, soiling with stools, presence of skin tags, and anal fissures. Digital rectal examination (DRE) is helpful in the diagnosis of anal stenosis; explosive passage of stools after withdrawing the examining finger is characteristic of Hirschsprung disease (blast sign). Routine DRE is not recommended when functional constipation is suspected.

Flowchart 2: Algorithm for approach to constipation in the emergency department (ED).



Examination of the spine should look for the presence of sacral dimple/tuft of hair along with lower-limb tone, power, and reflexes to consider spinal cord abnormalities. Identifying "red flag" symptoms and signs is important to decide management in the ED, and to differentiate between functional constipation and *constipation due and organic causes*, to provide suitable advice regarding further outpatient department (OPD) evaluation **(Box 3 and Table 1)**.

BOX 3: Red flag symptoms and signs in constipation.

- Delayed passage of meconium (beyond 48 hours of life)
- Constipation starting early during infancy
- Family history of Hirschsprung disease
- Ribbon stools
- Blood in the stools in the absence of anal fissures
- Failure to thrive
- Fever
- Bilious vomiting
- Abnormal thyroid gland
- Severe abdominal distension
- Perianal fistula
- Abnormal position of anus
- Absent anal or cremasteric reflex
- Decreased lower extremity strength/tone/reflex tuft of hair on spine
- Sacral dimple
- Gluteal cleft deviation
- Extreme fear during anal inspection anal scars

TABLE 1: Diagnostic clues and management for organic causes of constipation.

Symptoms/signs	*Possible diagnosis*	*Next step of management*
• Delayed passage of meconium • Early-onset constipation (<1 month age) • Family history of Hirschsprung disease • "Blast sign" on digital rectal examination	Hirschsprung disease	• Refer to pediatric surgery • Rectal suction biopsy for confirmation
• Passage of ribbon-like stools/decreased stool caliber • Early onset of constipation	Anal stenosis	Refer to pediatric surgery
Acute-onset constipation, abdominal pain, bilious vomiting, abdominal distension	• Intestinal obstruction • Intussusception • Volvulus	• Abdominal decompression by nasogastric tube insertion • Initial stabilization • Refer to pediatric surgery
Developmental delay, dry skin, cold intolerance, midline neck swelling	Hypothyroidism	Thyroid profile
Failure to thrive, recurrent lower respiratory tract infections, oily stools	Cystic fibrosis	Sweat chloride test
Failure to thrive, abdominal distension with or without abdominal pain, anemia with stool occult blood negative	Celiac disease	Serum TTG IgA and total IgA levels
Fever, weight loss, anemia, blood in stools	Inflammatory bowel disease	• CBC, ESR, CRP • Refer to pediatric gastroenterology
• Any lower-limb weakness • Decreased tone, strength, reflexes in lower limbs, absent cremasteric reflex • Sacral dimple/tuft of hair • Perianal fistula	Spinal cord abnormalities	MRI spine

(CBC: complete blood count; CRP: C-reactive protein; ESR: erythrocyte sedimentation rate; MRI: magnetic resonance imaging; TTG IgA: tissue transglutaminase immunoglobulin A)

INVESTIGATIONS

Though functional constipation is a clinical diagnosis, abdominal X-ray is useful for the demonstration of fecal impaction as it has therapeutic implications. Laboratory testing for organic causes like hypothyroidism, celiac disease, and hypercalcemia and allergy testing are not routinely recommended, in the absence of red flag signs or symptoms. Further evaluation on outpatient basis, including magnetic resonance imaging (MRI) spine can be done in children in whom neurological examination is suggestive of spinal abnormalities.

EMERGENCY CARE

Like any patient coming to the ED, the initial steps consist of primary assessment including vital signs, focused history and examination, identification of red flag signs, and investigations if needed. Patients with suspected peritonitis need emergent management with intravenous fluids keeping them nil by mouth, analgesics, baseline investigations in anticipation of surgery, broad-spectrum antibiotics, pediatric surgery consultation, and likely a computed tomography scan, and close hemodynamic monitoring. Patients with suspected intestinal obstruction need intravenous fluids keeping them nil by mouth, analgesics, abdominal X-ray, and pediatric surgery consultation.

SPECIFIC MANAGEMENT

Disimpaction

- It is identified by the presence of a hard mass in the lower abdomen during a physical examination, a dilated rectum filled with a large amount of stool during a rectal examination, or excessive stool in the distal colon visible on abdominal radiography.
- Disimpaction allows the rectum to restore its normal diameter and tone, enabling normal anorectal reflexes and pelvic floor coordination for stool expulsion. Oral disimpaction using high-dose polyethylene glycol (PEG) and rectal enemas are equally effective for disimpaction. Oral route is preferred as it is less invasive and has better patient tolerability **(Table 2)**.
- Phosphate enemas should not be used in children below 1 year of age. The enema may be repeated two more times, 24 hours apart, for a maximum of three doses. They should be used with caution in children with dehydration, prolonged enema retention, or renal impairment as they can rarely lead to hyperphosphatemia, hypocalcemia, and tetany.

TABLE 2: Disimpaction.		
Agent	***Dose and duration***	***Side effects***
Polyethylene glycol (powder to be reconstituted in water)	1.5–2 g/kg/day in two divided doses for 3–6 days	Loose stools, bloating/flatulence
Polyethylene glycol solution	25 mL/kg orally or by nasogastric tube over 4–6 hours	Nausea, vomiting, abdominal cramps, rarely electrolyte abnormality
Phosphate enema	• *2–18 years:* 2.5 mL/kg maximum dose: 133 mL/dose • Enema once daily for 3–6 days is recommended	• Hyperphosphatemia • Hypocalcemia

Maintenance Therapy

Following successful disimpaction maintenance laxative therapy keeps the bowel moving and empty, preventing further stool retention. The goals of maintenance therapy are to ensure stools are soft and painless, stool reimpaction, and eliminate the recurrence of stool-withholding behavior. PEG is considered as the first choice of laxative for both disimpaction and maintenance treatment.[8] Osmotic laxatives are recommended for maintenance therapy for at least 2 months' duration. The child should be symptom-free for at least 1 month before the discontinuation of maintenance therapy.

If perianal irritation or anal fissures are present, local perianal care may relieve painful defecation and decrease stool-retentive behavior.

Osmotic Laxatives

Osmotic laxatives, such as PEG, lactulose, and milk of magnesium hydroxide (MOM), contain osmotically active ions or molecules that are minimally absorbed in the small intestine, and promote water retention in the colon, thereby helping to soften stools. PEG is more effective compared to lactulose or milk of magnesia but is not approved for use in infants. Lactulose is preferred in children below 1 year of age **(Table 3)**.

TABLE 3: Osmotic laxatives for maintenance therapy.		
Agent	***Dose***	***Side effects***
Polyethylene glycol	0.5–1 g/kg/day in children >1 year of age	• Bloating • Abdominal pain/cramps • Vomiting, loose stools
Lactulose	• *Age <1 year:* 2.5 mL BD • *1–5 years:* 2.5–10 mL BD • *5–18 years:* 5–20 mL BD	• Abdominal distension • Discomfort • Flatulence
Milk of magnesia	• *2–5 years:* 0.4–1.2 g/day, once or divided doses • *6–11 years:* 1.2–2.4 g/day, once or divided doses • *12–18 years:* 2.4–4.8 g/day, once or divided doses	• Hypermagnesemia • Hypocalcemia • Hypophosphatemia

Stimulant Laxatives

Stimulant laxatives, like senna and bisacodyl, act by enhancing intestinal motility and interfering with the transport of water and electrolytes across the epithelial layer. As a result, they are commonly associated with side effects like abdominal cramps and discomfort. They are used as second-line therapy or add-on therapy in chronic constipation not responding to osmotic laxatives alone.

NONPHARMACOLOGICAL ADJUNCTIVE THERAPIES

Toilet Training

Toilet training should be started in children at 3–4 years of age. Adhere to the "Rule of 1" for toilet training: One person, follow one routine (make the child sit for 5–10 minutes in the toilet within 30 minutes of each major meal), one place, and use one word such as "pooh" or "potty". Appropriate angulation of the knees and thighs to facilitate the expulsion of stools can be achieved by squatting in an Indian toilet or using a footrest in a Western toilet seat.

Diet and Physical Activity

A high-fiber diet, decreasing consumption of animal milk, additional fluid intake, and physical activity are important long-term measures in chronic constipation. The routine use of prebiotics and biofeedback therapy is not recommended for treating childhood constipation.

KEY LEARNING POINTS

- Diagnosis of constipation is primarily clinical, based on history and physical examination.
- Use red flag signs and symptoms and diagnostic clues to identify any underlying disease responsible for constipation.
- Routine use of abdominal radiographs is not recommended for diagnosing functional constipation. However, a plain abdominal radiograph may be used if fecal impaction is suspected but a physical examination is unreliable or not possible.
- High-dose PEG at a dose of 1.0–1.5 g/kg/day for 3–6 days is recommended as the first-line treatment for children with fecal impaction. If PEG is not available, an enema once per day for 3–6 days is an alternative.
- PEG is recommended as the first-line maintenance treatment, starting at a dose of 0.5 g/kg/day, adjusted according to clinical response. Lactulose can be used if PEG is not available. The addition of enemas is not recommended for maintenance.
- Further assessment and maintenance treatment should continue on OPD basis.

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