Pediatric Constipation and Encopresis — Diagnosis and Treatment

Definition of Pediatric Constipation

Constipation definition is relative to stool frequency, consistency and the effort involved in passing the same. To expound on “abnormal,” we need to define “normal.”

In the UK, motions about thrice a day to alternate daily are considered “normal.” Constipation often conveys the infrequent passage of hard, dry stool. Symptoms for more than two weeks are considered significant.

The Iowa criteria of constipation meant for children at least two years of age comprises of two or more of the following characteristics in the 8 weeks preceding examination:

- Painful defecation
- Less than three bowel movements per week
- Large stools in the rectum or felt on abdominal examination
- History of large sized stools that may obstruct the toilet
- More than one episode of fecal incontinence per week
- Retentive posturing (withholding behavior)

Functional (voluntary) withholding is the most common cause of constipation.

**Functional constipation**, as defined by the [ROME III classification](https://www.nature.com/articles/romet.2014.22), requires two or more of the following features in a child with developmental age ≥ 4 years and occurring at least once per week for at least two months before diagnosis (with insufficient criteria for a diagnosis of [irritable bowel syndrome](https://www.nature.com/articles/romet.2014.22)).

The features of the ROME classification are summarized as below:

- History of agonizing or rigid bowel movements
- Passing of stools so large that they obstruct the toilet
- At least one episode of fecal incontinence per week
- History of retentive posturing or excessive voluntary stool retention
- Two or fewer defecations in the toilet per week
- Presence of a large fecal mass in the rectum

The latest in the terminology of pediatric constipation is **“non-retentive fecal soiling.”**

Originally coined for children soiling albeit no difficult infrequent defecation; [PACCT](https://www.pacct-us.org) (The Paris Consensus on Childhood Constipation Terminology Group) define this pathology as “passage of stools in an inappropriate place, occurring in children with a mental age of 4 years and older, with no evidence of constipation on history or examination.”

**Epidemiology**

Childhood constipation is most commonly seen in toddlers around the time of toilet training. A positive family history is often present in about 26 – 48% of patients.

**Clinical Signs and Symptoms of Pediatric Constipation**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stool withholding maneuvers</td>
<td>• Often misinterpreted as straining; the typical features of such mannerisms are:</td>
</tr>
<tr>
<td></td>
<td>• Infants: back-arching</td>
</tr>
<tr>
<td></td>
<td>• Older infants/toddlers: moving back and forth, straightening legs, tip-toeing</td>
</tr>
<tr>
<td></td>
<td>• Older children: stand stiff or squat.</td>
</tr>
<tr>
<td>Blood in stools</td>
<td>Painful bleeding per rectum in older children is associated with fissures, fistulae, infection, and may be a harbinger of Crohn’s disease. The child should be investigated for the same. Children with rectal polyps present with painless bleeding. In infancy, this is classically associated with cow milk protein allergy.</td>
</tr>
<tr>
<td>Pain</td>
<td>Pain is an enigmatic constellation of clues rather than a single symptom many times. In pediatric constipation, pain is segregated as per location, character and timing. Pain can be present in the abdomen or locally around the anus. Associated complaints help look at pain and use it as a cue for diagnosis in the right perspective.</td>
</tr>
<tr>
<td>Infrequent stools</td>
<td>Reduced bowel movement is often synonymous with constipation and is a defining criterion for the same. However, almost half of the pediatric population with constipation does not have a reduced frequency of passage of stools.</td>
</tr>
</tbody>
</table>
Soiling

Though paradoxical and often mistaken as diarrhea; meager, involuntary fecal soiling is associated with constipation in almost 90% of children.

Enuresis and other urinary disturbances

Compression of the bladder by impacted stools in the rectum can simulate enuresis. Chronic pelvic muscular contraction often culminates in incomplete relaxation during voiding and post void residues.

Associated issues

Obesity, whether a direct correlation or a confounding factor not being discerned at present, is often associated with constipation.

<table>
<thead>
<tr>
<th>Situation</th>
<th>Explanation</th>
</tr>
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<tbody>
<tr>
<td>Difficult toilet training</td>
<td>Often less adaptable and with a pessimistic attitude, these children are more likely to be constipated. They stand to benefit from positive reinforcement behavioral therapies.</td>
</tr>
<tr>
<td>Febrile illness</td>
<td>Decreased fluid intake after a fever often manifests as hard stools.</td>
</tr>
<tr>
<td>Secondary diversions</td>
<td>Though completely benign in nature, these reasons might hold up mothers for a long time in anxiety. Short use of school toilet, running to school in the morning, withholding stools for simple secondary mind diversions may mimic constipation.</td>
</tr>
<tr>
<td>Secondary constipation</td>
<td>Constipation secondary to an organic cause is seen only in about 10% of a pediatric population. Refractory constipation, family history, associated symptoms may hint towards the diagnoses such as hypothyroidism and Hirschsprung’s disease.</td>
</tr>
<tr>
<td>Stool withholding behavior</td>
<td>Pain defecation in childhood may lead to reflex stool withholding behavior, which engulfs the child in a vicious cycle of the passage of more hard stools and more pain. Adequate treatment of the original trigger alleviates this behavior.</td>
</tr>
</tbody>
</table>

Etio-pathogenesis of Pediatric Constipation

Constipation is often a symptom of a grave problem, other times a diagnosis by itself. The pathogenesis varies as per the cause, trigger and the circumstances around which a child develops constipation.

Some peculiar situations can be tabulated as follows:

Diagnosis of Pediatric Constipation

Constipation being a varied etiology, one has to be cautious in segregating organic from functional causes as the treatment differs accordingly.

A systematic approach with meticulous history taking and disciplined progress through examination and then imaging is often successful. History should reveal any positive findings which help in classifying “constipation” as per the type of etiology mentioned above. Detailed history about bowel habit, toilet training and stool habits in different environments at school and home is a must.

A rectal examination should be carried out in accordance with the NICE guidelines by an expert, and should reveal information about sphincter tone and rectal loading.

A perineal examination is helpful in anorectal anomalies and perianal infections. Associated neurological, mental status and other systems examination is carried out when deemed necessary.

History and examination must decisively rule out the few tell-tale signs of organicity as mentioned below:
### Investigations

Constipation is mainly a clinical diagnosis. A few ancillary helpful tests are mentioned below:

<table>
<thead>
<tr>
<th>Test</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal skiagram (X-ray)</td>
<td>Assessment of colon and rectosigmoid area as per &quot;Leech system&quot; for the presence of stools is often helpful.</td>
</tr>
<tr>
<td>Abdominal ultrasonography (USG)</td>
<td>Rectopelvic ratio is calculated using USG to define &quot;megarectum&quot; in children with constipation.</td>
</tr>
<tr>
<td>Anal manometry</td>
<td>Often used in children with refractory symptoms and for planning surgical interventions</td>
</tr>
<tr>
<td>Initial blood screen</td>
<td>For hypothyroidism, markers of inflammation, nutritional assessment</td>
</tr>
<tr>
<td>Sweat testing, electrolytes</td>
<td>For cystic fibrosis when indicated</td>
</tr>
<tr>
<td>Rectal biopsy</td>
<td>Gold standard for diagnosis of Hirschsprung’s disease</td>
</tr>
</tbody>
</table>

### Differential diagnosis

The following differentials should be addressed when dealing with a child with constipation:

- Hypothyroidism
- Hirschsprung’s disease
- Cystic fibrosis with meconium ileus
- Anteriori displaced anus
- Botulism

**Liquid stool** may pass around the hard stool mass and give a false impression of diarrhea (encopresis).

### Treatment of Pediatric Constipation

Treatment consists of 2 phases: **initial disimpaction** intended to relieve the acute constipation, followed by **maintenance therapy** to evade constipation and prevent recurrence in the long run.

#### Disimpaction

Acute relief of constipation by **dislodging the impacted stools** is the first step in the...
management of constipation. Disimpaction is typically performed over 2-5 days. Various measures utilized for disimpaction can be summarized as follows:

<table>
<thead>
<tr>
<th>Mode of treatment</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| Oral/nasogastric approach| • Progressively increasing the oral dose of polyethylene glycol (PEG) is often the first line of management.  
• Magnesium containing preparations are avoided to prevent overdose and toxicity complications. Lactulose, sorbitol, senna or bisacodyl laxative can also be used. |
| Rectal approach          | Saline and mineral oil enemas can be used. Phosphate preparations are best avoided in light of acute phosphate nephropathy secondary to such products. |

**Maintenance therapy**

Once disimpaction occurs, maintenance therapy is initiated to prolong the benefits of disimpaction and eventually to prevent recurrence. It typically takes about 3-12 months and is terminated once the child achieves the smooth return of bowel movements.

<table>
<thead>
<tr>
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<tr>
<td>Behavioral modification</td>
<td>Functional constipation being the most common etiology of childhood constipation; behavioral therapy has a lion’s share in maintenance therapy of constipation. Proper toilet training, effective schooling, reinforcing good habits positively play an important part.</td>
</tr>
<tr>
<td>Education</td>
<td>Understanding is the first step towards acceptance and treatment of the causative factor. A child should never be blamed for soiling, withholding maneuvers and should be treated with benevolent understanding. Parent education and counseling is a must in this perspective. Toileting at school may be improved with the help of the school nurse and teachers.</td>
</tr>
<tr>
<td>Diet</td>
<td>Optimization of a child’s diet with fibers, adequate fluid intake, fruits and vegetables is beneficial in the long run.</td>
</tr>
<tr>
<td>Laxatives</td>
<td>While the chronic use of stool softeners is strongly discouraged, use of medications at half of disimpaction dose is often instrumental in making the transition from disimpaction to maintenance phase uneventful. PEG is often the first choice followed by lactulose, senna, sorbitol and other laxatives. Stimulant laxatives are best avoided.</td>
</tr>
</tbody>
</table>

**Organic diseases** are to be treated as per cause.

The need for **surgical intervention** is seldom and only after failure of medical management.

**Complications of Pediatric Constipation**

Pediatric constipation is not a serious condition, even though it makes children uncomfortable. However, untreated or chronic constipation can lead to the following complications:

- Breaks in the skin surrounding the anus, which causes pain (anal fissures)
- The rectum may protrude out of the anus (rectal prolapse)
- The child will withhold stool owing to pain
- Owing to pain, the child will avoid bowel movements, resulting in impacted stool collecting in the colon and rectum before leaking out (encopresis)
Pediatric Encopresis

Definition

Passage of feces in inappropriate situations after a chronological age of 4 years (or equivalent developmental level) is termed as encopresis.

Classification

Encopresis is often classified variously as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retentive</td>
<td>With constipation and secondary overflow and leakage around obstruction; more common</td>
</tr>
<tr>
<td>Non-retentive</td>
<td>Without constipation</td>
</tr>
<tr>
<td>Primary</td>
<td>Seen in boys from infancy and often associated with global developmental delay and enuresis</td>
</tr>
<tr>
<td>Secondary</td>
<td>Seen in children after successful toilet training, often functional in nature, marked with a higher level of stressors and psychological disorders</td>
</tr>
</tbody>
</table>

Encopresis is more common in boys to the extent that 4-6:1 is the claimed sex ratio.

Etiology of Pediatric Encopresis

Pediatric encopresis is caused mostly by constipation and emotional issues. Emotional issues that may trigger encopresis in children include:

- Premature, unplanned, difficult or conflicting toilet training
- Alterations in a child’s schedule, including diet, starting school, toilet training, etc.
- Mental stressors, such as the birth of another child or a parental divorce.

Pathophysiology of Pediatric Encopresis

In an overwhelming majority of cases, encopresis results from chronic constipation leading to overflow incontinence. Chronic constipation that results in incomplete evacuation of stools leads to continuous rectal distention as well as stretching of both the internal and external anal sphincter. Over time, the child gets used to chronic rectal distention, which makes him/her lose the ability to sense the normal urge to defecate. Fecal soiling results from the soft or liquid stool leaking around the retained fecal mass.

Clinical features of Pediatric Encopresis

A child with encopresis may come up with the following signs and symptoms:

- Stool or liquid stool may leak on their underwear and may be mistaken for diarrhea
- Abdominal pain
- Loss or lack of appetite
- Pass big stool that blocks or almost blocks the toilet
- Avoiding bowel movements
- Interval between bowel movement will be prolonged
- Constipation with dry, hard stool
May have daytime wetting or bedwetting (enuresis)
- Recurrent bladder infections, especially in girls

Diagnosis of Pediatric Encopresis

Salient points in the diagnostic assessment of pediatric encopresis can be summarized as follows:

<table>
<thead>
<tr>
<th>Diagnostic assessment</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points on history</td>
<td>Meticulous history taking often reveals dissociated psychosocial functioning of the child which leads to encopresis. Other relevant facts such as toilet training, abuse, and toileting at school are also unearthed.</td>
</tr>
<tr>
<td>Points on examination</td>
<td>Presence of fecal retention nails chronic constipation. Negative rectal exam necessitates imaging tests like X-ray.</td>
</tr>
<tr>
<td>Investigations</td>
<td>X-ray reveals the level of fecal impaction, megacolon, and intestinal pseudo-obstruction.</td>
</tr>
<tr>
<td>EMG studies</td>
<td>Abnormal sphincter physiology reflects poor prognosis.</td>
</tr>
</tbody>
</table>

Treatment of Pediatric Encopresis

Encopresis is often an embarrassing diagnosis and all efforts towards the alleviation of anxiety should be undertaken. It is often self-limiting and benign otherwise. Treatment addresses constipation and then the underlying psychosocial stressor in a step-wise manner. The strategy can be summarized as follows:

<table>
<thead>
<tr>
<th>Treatment modality</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address constipation</td>
<td>All measures mentioned in the disimpaction phase of constipation are similarly used for acute relief. Short term use of laxatives is typically preferred.</td>
</tr>
<tr>
<td>Psychotherapy</td>
<td>Concomitant behavioral modification, reinforcement of good toilet habits, enhancement of compliance towards regular bowel motions, improved parental education, counseling and understanding form the keystones in psychotherapy of encopresis.</td>
</tr>
<tr>
<td>Diet</td>
<td>High fiber balanced diet with optimal fluid intake is recommended.</td>
</tr>
<tr>
<td>Gastroenterologist reference</td>
<td>Though seldom indicated, the presence of megacolon and other signs of the underlying grave organic disease might call for specialty intervention once in a while.</td>
</tr>
<tr>
<td>Medications</td>
<td>Tricyclic antidepressants have been tried by some groups, but the evidence rather remains equivocal. Also, exacerbation of symptoms of constipation leads to a limited role in retentive encopresis.</td>
</tr>
</tbody>
</table>

Prognosis

Regression of encopresis is rather a rule than a myth in most of the cases, irrespective of the treatment modality used. Albeit the above statement, treatment is often indicated as it is associated with long lasting psychological effects on the young minds.

Summary

Childhood constipation is a common, disturbing complaint. It is often a symptom than a
diagnosis by itself. Various criteria are proposed to objectively define “constipation.” **Functional constipation** is the most common cause of constipation. **Infrequent defecation, pain, soiling, stool-withholding and enuresis** are often the involved symptoms.

Meticulous **history, examination** and **supplementary diagnostic tests** help clinch the diagnosis. One should always be cautious of the **“red-flag” signs** which indicate underlying serious organic disease. Treatment of chronic constipation is divided into **acute disimpaction phase** for immediate relief of constipation, followed by **maintenance phase** to evade relapses.

**Laxatives, diet modifications, education and counseling, and behavioral therapy** are instrumental in the treatment of pediatric constipation. Pediatric encopresis is an inappropriate passage of feces in inept circumstances in children above 4 years of chronological age, or after reaching equivalent developmental age. It is more common in **boys** and is variously classified into primary/secondary and retentive/non-retentive categories.

**Psychosocial stressors** are often associated with encopresis. Consequently, **behavioral therapy** to ameliorate the same plays a significant role. Encopresis usually resolves in the majority of patients irrespective of the treatment modality used.

**Review Questions**

The correct answers can be found below the references.

1. **X-ray staging system used to discern constipation is:**
   A. Leech system
   B. Laud system
   C. Mc-collin system
   D. Hirschsprung system.

2. **Which of the following statements is false regarding chronic constipation?**
   A. Laxative use is discouraged in childhood constipation
   B. Chronic constipation is common in pediatric population
   C. Behavioral therapy has no role in the management of chronic constipation
   D. Disimpaction is typically carried out with PEG.

3. **Which of the following statements is true about encopresis?**
   A. Non-retentive encopresis is more common
   B. Encopresis has a good prognosis
   C. Chronic laxative use is advocated
   D. Encopresis is more common in girls.

**References**


**Correct answers:** 1A, 2C, 3B

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