

## Constipation

- It is an extremely common reason for consultation in children. Parents may use the term to describe [decreased frequency of defecation; increase the degree of hardness of the stool and painful defecation].
- The 'normal' frequency of defecation is highly variable and varies with age. Infants have an average of four stools per day in the first week of life, but this falls to an average of two per day by 1 year of age. Breast-fed infants may not pass stools for several days and be entirely healthy.
- By 4 years of age, children usually have a stool pattern similar to adults, in whom the normal range varies from three stools per day to three stools per week.
- A pragmatic definition of constipation is the infrequent passage of dry, hardened feces often accompanied by straining or pain. There may be abdominal pain which waxes and wanes with passage of stool or overflow soiling. The cause of constipation is often unclear and multifactorial. In infants, Hirschsprung disease, anorectal abnormalities, hypothyroidism and hypercalcemia need to be considered. Constipation may be precipitated by dehydration or reduced fluid intake or anal fissure causing pain. In older children, it may relate to problems with toilet training, unpleasant toilets or stress.
- Any definition of constipation is relative and depends on stool consistency, stool frequency, and difficulty in passing the stool. A normal child might have a soft stool only every second or third day without difficulty; this is not constipation. A hard stool passed with difficulty every third day should be treated as constipation. Constipation can arise from defects either in filling or emptying the rectum. It is rare in breast-fed infants receiving an adequate amount of milk and is rare in formula-fed infants receiving an adequate intake. The consistency of the stool, not its frequency, is the basis for diagnosis. Most infants have 1 or more stools daily, but some occasionally have a stool of normal consistency at intervals of up to 36–48 hr. Whenever constipation or obstipation is present from birth or shortly after birth, a rectal examination should be performed. Tight or spastic anal sphincters may occasionally be responsible for obstipation, and finger dilation is frequently corrective. Anal fissures or cracks may also cause constipation. If irritation is alleviated, healing usually occurs quickly.
- Aganglionic megacolon may be manifested by constipation by early infancy, the absence of stool in the rectum on the digital examination suggest this possibility but further diagnostic workup is indicated. Constipation may be caused by an insufficient amount of food or fluid.

## Causes of Constipation

### Nonorganic (functional)

**Retentive:** Anatomic, Anal stenosis, atresia with fistula, Imperforate anus, anteriorly displaced anus, Intestinal stricture (post necrotizing enterocolitis), Anal stricture

**Abnormal Musculature:** Prune-belly syndrome, Gastroschisis, Down syndrome  
Muscular dystrophy

**Intestinal Nerve or Muscle Abnormalities:** Hirschsprung disease, Pseudo obstruction (visceral myopathy or neuropathy), Intestinal neuronal dysplasia, Spinal cord lesions, Tethered cord

**Autonomic neuropathy:** Spinal cord trauma, Spina bifida, Chagas disease

**Drugs:** Anticholinergics, Narcotics, Methylphenidate, Phenytoin, Antidepressants, Chemotherapeutic agents (vincristine), Pancreatic enzymes (fibrosing colonopathy)

Lead, arsenic, mercury, Vitamin D intoxication, Calcium channel blocking agents

**Metabolic Disorders:** Hypokalemia, Hypercalcemia, Hypothyroidism, Diabetes mellitus, diabetes insipidus, Porphyria

**Intestinal Disorders:** Celiac disease, Cow's milk protein intolerance, Cystic fibrosis (meconium ileus equivalent), Inflammatory bowel disease (stricture)

Tumor

**Connective tissue disorders:** Systemic lupus erythematosus, Scleroderma

**Psychiatric Diagnosis:** Anorexia nervosa

Examination often reveals a palpable abdominal mass in a well-looking child. Digital rectal examination should only be performed by a pediatric specialist and only if a pathological cause is suspected. **'Red Flag'** symptoms and signs indicative of more significant pathology.

Investigations are not usually required to diagnose idiopathic constipation but are carried out as indicated by history or clinical findings

<b>Red Flag' symptom/ signs</b>	<b>'Diagnostic concern</b>
Failure to pass meconium within 24 h of life	Hirschsprung disease
Failure to thrive/growth failure	Hypothyroidism, coeliac disease, other causes
Gross abdominal distension	Hirschsprung disease or other gastrointestinal dysmotility
Abnormal lower limb neurology or deformity, e.g. talipes or secondary urinary incontinence	Lumbosacral pathology
Sacral dimple above natal cleft, over the spine – naevus, hairy patch, central pit, or discoloured skin	Spina bifida occulta
Abnormal appearance/ position/patency of anus	Abnormal anorectal anatomy
Perianal bruising or multiple fissures	Sexual abuse
Perianal fistulae, abscesses or fissures	Perianal Crohn disease

- Constipation arises **acutely** in young children, for example after an acute febrile illness, usually resolves spontaneously or with the use of mild laxatives and extra fluids. In more **long-standing constipation**, the rectum becomes overdistended, with a subsequent loss of feeling the need to defecate. **Involuntary soiling** may occur as contractions of the full rectum inhibit the internal sphincter, leading to overflow. Management of these children is likely to be more difficult and protracted. Children of school age are frequently teased as a result, and secondary behavioral problems are common.
- It should be explained to the child and the parents that the soiling is involuntary and that recovery of normal rectal size and sensation can be achieved but may take a long time. The initial aim is to evacuate the overloaded rectum completely. This can generally be achieved using a disimpaction regimen of stool softeners, initially with a macrogol laxative, e.g. polyethylene glycol + electrolytes (Movicol Pediatric Plain). **Dietary interventions** alone are unlikely to be successful in managing constipation in this situation, although the child should receive sufficient fluid and a balanced diet including adequate fiber.
- The child should be encouraged to **sit on the toilet after mealtimes** to utilize the physiological gastrocolic reflex and improve the likelihood of success.
- The outcome is more likely to be successful if the child is engaged in the treatment process. This requires exploring the child's concerns and motivation to change. Sometimes use of a star chart is helpful to record and reward progress, as well as motivating the child. Encouragement by family and health professionals is essential, as relapse is common and psychological support is sometimes required. Occasionally, the fecal retention is so severe that evacuation is only possible using enemas or by manual evacuation under an anesthetic. They should only be performed under specialist supervision, paying particular attention to avoiding distress and embarrassment for the child.

**In summary, 5 interventions are available**

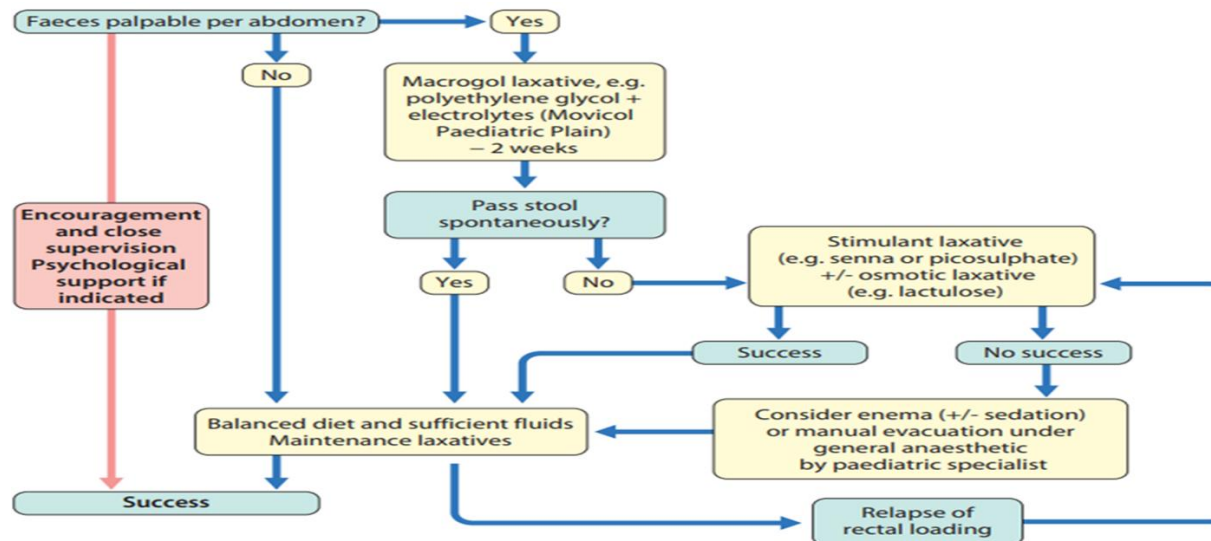
1-Dietary: Simply increasing the amount of fluid or sugar in the formula may be corrective during the 1st few months of life. After this age, better results are obtained by adding or increasing the intakes of cereal, vegetables, and fruits. Prune juice (½–1 oz) may be helpful, but adding foods with some bulk is usually more effective.

2- Polyethylene glycol (PEG): is effective for disimpaction and maintenance and is regarded as first line treatment for functional constipation in children.

3-Milk of magnesia: may be given in doses of 1–2 tsp but should be reserved for unresponsive or severe constipation. Less effective and palatable than PEG. Infants receiving magnesium-rich formula were reported to have a significantly softer stool consistency and a significantly higher defecation frequency compared with infants receiving regular formula. Side effects of magnesium hydroxide include diarrhea, abdominal pain, and bloating. Magnesium hydroxide should be used with caution in children with renal insufficiency, owing to the increased chance of hypermagnesemia

4- Probiotics: Studies showed that probiotics have the potential to increase stool frequency.

5-Enemas and suppositories: e.g. glycerine suppositories should never be more than temporary measures.



## HIRSCHSPRUNG DISEASE (Congenital Aganglionic Megacolon)

HD is the most common cause of lower intestinal obstruction in neonates, seen in Male More than Female. It may be associated with other congenital syndromes or defects e.g. Down; it is uncommon in premature infants. Absence of ganglion cells in the bowel wall; although it is mainly limited to the rectosigmoid (75%), it may extend proximally and involve the entire colon in 10% of cases.

History: It should be suspected in any full-term infant with delayed passage of meconium >48 hrs. after birth (because 99% of full-term infants pass meconium within 48 hrs. of birth), although some infants with HD pass meconium normally but subsequently present with chronic constipation. Less common presentation is FTT with hypoproteinemia (due to protein-losing enteropathy). Breast-fed infants may not suffer as severe a disease as formula-fed infants.

Examination: Abdominal exams reveal distention with large fecal mass is palpable in the left lower abdomen; rectal exam reveals normal anal tone with empty rectum; rectal exam is usually followed by an explosive passage of foul-smelling feces and gas.

Cx. Enterocolitis is due to stasis that allows proliferation of bacteria, e.g. Clostridium difficile, Staphylococcus aureus, anaerobes, coliforms, with associated sepsis and signs of bowel obstruction.

D.Dx. In neonates, HD must be differentiated from; meconium plug syndrome, meconium ileus, and intestinal atresia. In older patients, it must be differentiated from: functional constipation & other causes of non- mechanical

## Investigations

**Ba-enema** should be done after the 2nd wk of life without preparation. It may show a Transition zone between normal dilated proximal colon and a smaller-caliber obstructed distal colon (except when the entire colon is affected). If only the rectosigmoid is affected, picture is similar to those with functional constipation. Ba retention also helpful in Dx.

**Rectal suction biopsies** are the procedure of choice; it should be performed no closer than 2 cm from the dentate line. It also can be done intraoperatively. The biopsy shows absence of both Meissner & Auerbach plexuses, hypertrophied nerve bundles, & high concentration of acetylcholinesterase.

**Anorectal manometry** measures the pressure of the internal anal sphincter response to a balloon distended in the rectum; it shows either failure to relax or "paradoxical" rise in its pressure.

Rx. Surgery

## Colic

a symptom complex of paroxysmal abdominal pain, presumably of intestinal origin, and severe crying. It usually occurs in infants younger than 3 months of age

### The clinical manifestations

The clinical manifestations are characteristic. The attack usually begins suddenly, with a loud, sometimes continuous cry. The paroxysms may persist for several hours.

The infant's face may be flushed, or there may be circumoral pallor. The abdomen is usually distended and tense. The legs may be extended for short periods but are usually drawn up on the abdomen. The feet are often cold, and the hands are usually clenched. The attack may not end until the infant is completely exhausted. Sometimes, the passage of feces or flatus appears to provide relief.

### The etiology

Fewer than 5% of infants evaluated for excessive crying have an organic etiology, with no known association with feeding method or family history of food allergy or atopy. The etiology of colic is unknown and is likely multifactorial in etiology. Since it is a diagnosis of exclusion, evaluation of infants with excessive crying is necessary to rule out other serious diagnoses. Usually the cause is not apparent, the attacks seem to be associated with hunger or with swallowed air that has passed into the intestine. Overfeeding may cause discomfort and distention, some foods, especially those with high carbohydrate content, may result in excessive intestinal fermentation.

Crying with intestinal discomfort occurs in infants with intestinal allergy, but colic is not limited to this group. Colic may mimic intestinal obstruction or peritoneal infection. Attacks commonly occur in the late afternoon or early evening, suggesting that events in the household routine may be involved. Worry, fear, anger, or excitement may cause vomiting in an older child and may cause colic in an infant, but no single factor consistently accounts for colic, and no treatment consistently provides satisfactory relief.

Colic often is diagnosed using **Wessel's rule of threes**—crying for more than 3 hours per day, at least 3 days per week, for more than 3 weeks. The limitations of this definition include the lack of specificity of the word *crying* (e.g., does this include fussing?) and the necessity to wait 3 weeks to make a diagnosis in an infant who has excessive crying. Colicky crying is often described as paroxysmal and may be characterized by facial grimacing, leg flexion, and passing flatus.

### **Differential diagnosis of colic**

The differential diagnosis for colic is broad and includes any condition that can cause pain or discomfort in the infant, as well as conditions associated with nonpainful distress, such as fatigue or sensory overload. Cow's milk protein intolerance, gastroesophageal reflux disease (GERD), maternal substance use including nicotine, and anomalous left coronary artery all have been reported as causes of persistent crying. In addition, situations associated with poor infant regulation, including fatigue, hunger, parental anxiety, and chaotic environmental conditions, may increase the risk of excessive crying. In most cases, the cause of crying in infants is unexplained. If the condition began before 3 weeks' corrected age, the crying has a diurnal pattern consistent with colic (afternoon and evening clustering), the infant is otherwise developing and thriving, and no organic cause is found, a diagnosis of colic may be made.

### **Management**

The management of colic begins with education and demystification. When the family and the physician are reassured that the infant is healthy, education about the normal pattern of infant crying is appropriate. Anticipatory guidance should also be provided regarding atypical crying that warrants further medical attention. Learning about the temporal pattern of colic can be reassuring; the mean crying duration begins to decrease at 6 weeks of age and decreases by half by 12 weeks of age. Colic frequently resolves by 3 months of age. Approximately 15% of infants with colic continue to cry excessively after this age. Careful physical examination is important to eliminate the possibility of intussusception, strangulated hernia, or other serious causes of abdominal pain.

Helping families develop caregiving strategies for the infant's fussy period is useful. Techniques for calming infants “5 Ss”: swaddling, side or stomach holding, soothing noises (such as shushing, singing, or white noise), swinging or slow rhythmic movement (such as rocking, walking, or riding in a car), and sucking on a pacifier. Giving caregivers permission to allow the infant to rest or leave the infant alone in a safe place (such as a crib) when soothing strategies are not working may alleviate overstimulation in some infants; this also relieves families of guilt and allows them a wider range of responses to infant crying. It is important to encourage parents to seek help and support from others when they are becoming overwhelmed and to advise against harmful methods to soothe an infant (such as placing the infant on a vibrating clothes dryer). Parents should be specifically educated about the dangers of shaking babies.

**Medications**, including simethicone, lactase, phenobarbital, diphenhydramine, alcohol, dicyclomine, and have not been shown to be of benefit and may cause serious side effects; they are, therefore, not recommended. Some early studies have suggested that probiotics may be useful, but results have been conflicting, and further research is needed. Alternative treatments such as chamomile, fennel, vervain, licorice, and balm-mint teas have not been approved for use in infants and can cause serious side effects such as (hyponatremia and anemia).