# Evaluation and Treatment of Constipation 118

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Constipation is one of the most common gastrointestinal complaints in the United States. It afflicts approximately 1 in 6 individuals and is responsible for approximately 2.5 million physician visits each year. More than $400 million is spent annually on over-the-counter laxatives; at least 120 of these products are available. Although constipation affects all ages, both males and females, and all educational and socioeconomic levels, it is more common in the elderly. Women are affected two to three times more often than men. Constipation also accounts for over 13 million days of restricted activity and 3 million days of bed disability each year. Economic impact on resource utilization, quality of life and productivity is considerable.

Although constipation is a common problem, it is one that is poorly understood. Constipation represents an abnormality of bowel function. The term "abnormality" implies a deviation from normal, but there is no agreement as to what constitutes normal bowel habits. Physicians know what constipation is but have trouble accurately defining it. Patients may complain of bowel movements that are too infrequent or stools that are too hard, or they may be referring to defecation that feels incomplete. These symptoms may or may not imply specific abnormalities in bowel function. Since stool frequency is the easiest factor to measure, it is often used as a definition. Great variation in bowel frequency exists in the general population. The typical Westerner may have anywhere from two bowel movements per day to two bowel movements per week.

**Normal colonic function –** Evaluation of the patient with constipation requires understanding of normal function of the colon and anorectal area. The colon is a muscular organ, which is supplied by nerves originating both within and external to the surface that can absorb more than 90% of the fluid which enters it. In normal individuals, approximately 3 to 4 pints of fluid, representing bile, digestive juices, and ingested food, enter the colon from the small intestine each day. The colon is able to reabsorb the majority of this fluid, reducing the water content of the stool to about one-tenth this amount. Dietary fiber retains water in the stool and is responsible for stools that are bulkier, softer, and easier to pass. A change from liquid to semisolid occurs in the right and transverse portions of the colon (*Figure 1*). Although undigested food takes less than two hours to reach the colon, it may take as long as 2 to 5 days for it to be expelled as stool. This prolonged transit time is an important aspect of colonic function as it permits a longer period of time for water reabsorption to occur.

The descending colon serves as conduit through which stool is transferred to the rectosigmoid. The rectosigmoid serves as a storage area where stool water is further recovered through absorption. Contraction and emptying of the descending colon and rectosigmoid is stimulated by eating (gastrocolic reflex). In the rectum, the pelvic floor muscles (levator ani, puborectalis) regulate fecal retention and defecation (*Figure 2*). The puborectalis suspends the rectosigmoid and imposes constraints which facilitate voluntary stool retention (continence). Continence is also promoted by contraction of the internal and external anal sphincters.

The urge to defecate is signaled by the propulsion of feces from the sigmoid colon to rectum. Distention of the rectum causes relaxation of the internal anal sphincter. For defecation to proceed, the external anal sphincter and puborectalis must be voluntarily relaxed. With straining, the pelvic floor muscles descend, permitting straightening of the anus and rectum. Defecation is facilitated by squatting or sitting and by increasing intra-abdominal pressure.

The process of defecation is learned early in childhood and retains spontaneity throughout life in most persons. The spontaneity of this process may be lost due to trauma that occurs from childbirth or other reasons.

When puborectalis or external anal sphincter relaxation is incomplete, functional obstruction (anismus) may occur. Derangements (irregularities) in muscular relaxation may be congenital (Hirschsprung's disease). Congenital diseases are

most often diagnosed in childhood but numerous cases of Hirschsprung's disease have been reported in adulthood.

Nerves and muscles regulate the transit time of the colon. Derangements in either element may seriously disturb colonic function. When colonic transit time is prolonged (colonic inertia), excess fecal water reabsorption and retention may occur. A number of diseases, such as diabetes or scleroderma can affect the neural elements of the colon, resulting in severe constipation. Chronic stimulant laxative use can also result in damage to neural elements of the colon. The malady feeds itself, because individuals, with time, become increasingly dependent on laxatives which may be damaging the intrinsic neural function of the colon.

**Assessment** – A variety of diseases and conditions cause or are associated with constipation (*Table 1*). Medications should always be considered as a cause of constipation (*Table 2*). Inactivity, especially in bed-bound patients, may result in constipation. Depressed patients are more likely to become constipated but many of the drugs used to treat depression are themselves constipating. In many patients, no immediate cause for constipation will be identified.

Evaluation should begin with a history and physical examination. Patients should be asked what they mean by constipation and what their "normal" bowel habit is. The duration of symptoms, frequency of bowel movements, consistency of stools, straining or pain, sense of incomplete evacuation, and presence of blood should be documented. Colon cancer should be suspected in any patient over 40 with a change in bowel habit of short duration, gross bleeding, or a family history of colon cancer. Medications should be reviewed, including the use of over-the-counter laxatives, and dietary fiber intake should be quantitated by a careful diet history. Rectal examination should be performed by the physician to evaluate anal sphincter tone and voluntary puborectalis relaxation and detect signs of tenderness, obstructing masses, or blood. Screening blood studies often point to underlying conditions such as diabetes or a hypoactive thyroid gland.

If underlying pathology (abnormality) is suspected, structural evaluation of the colon by colonoscopy is recommended. In selected patients, specialized studies may be employed. The speed at which food moves through the colon can be evaluated by viewing radiopaque markers (Sitz markers) on abdominal x-ray five days after ingestion. Anorectal manometry can be used to measure resting and squeezing anal sphincter pressures, rectal sensation, compliance, and sphincter response. Hirschsprung's disease may present in adulthood and it is important to consider this possibility in individuals with constipation dating back to birth. Defecography evaluates completeness of rectal expulsion, identifies anatomic abnormalities, and evaluates puborectalis muscle relaxation by radiographic techniques.

**Management –** The management of constipation includes patient education about bowel function and diet, behavior modification, drug therapy, and infrequently, surgery. Patients should be encouraged to exercise regularly, eat a diet high in fiber, and respond to the urge to defecate. Time should be allowed for a bowel movement each day, and patients should be encouraged to attempt bowel movements after eating to make use of the gastrocolic reflex. Constipating medications should be discontinued or changed if possible. Patients should also be educated about laxatives and their side effects. Laxatives should be discontinued so that response to treatment can be accurately assessed.

Increased fluid intake is frequently recommended in the management of constipated patients, but whatever data is available is inconsistent. In one study, stool frequency was significantly greater and laxative use was reduced in individuals drinking 2 liters of water per day compared to those on *ad libitum* intake alone. However, in another study of over 800 elderly patients, intake of 6 or more glasses of water per day had no significant effect on bowel function.

In a survey of more than 62,000 women, the prevalence of constipation was significantly lower in women who engaged in daily physical activity. However, in a much smaller study of constipated men and women, regular exercise had little effect on bowel function.

*Fiber additives* are the safest, most effective way to prevent or treat constipation. Fiber absorbs many times its weight in water, swelling within the colon and producing larger, softer stool that the digestive tract can pass quickly and easily. The American diet contains only 10-15 grams of fiber per day. Typically, an additional 15-20 grams is recommended. Foods high in fiber include beans and legumes, whole grains, and certain fruits and vegetables.

Most patients find dietary manipulation unacceptable. Therefore, many physicians generally start with a commercially available fiber supplement. These supplements, often referred to as the bulk-forming agents, include products containing psyllium seed husk (Metamucil, Konsyl), or methylcellulose (Citrucel), or polycarbophyl (Fibercon). Bulk-forming agents are available in a variety of forms (e.g., granular, powder, cookie, or tablet). The dose should be increased gradually since patients may initially experience abdominal cramping, bloating, and flatulence as a result of gas production by colonic bacteria.

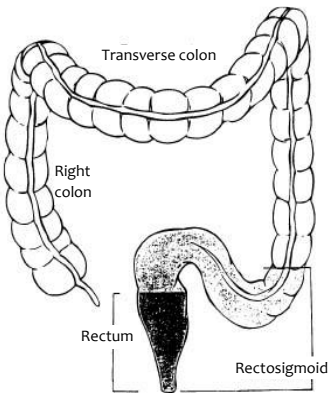


FIGURE 1

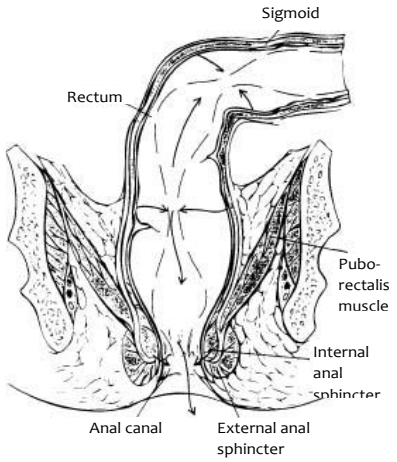


FIGURE 2

**Conditions Associated with Constipation**

**Colonic Disorders**

Irritable bowel syndrome
Cancer
Inflammation
- Diverticulitis
- Crohn's disease

Chronic laxative use (cathartic colon)
Pelvic muscle injury
- Rectal prolapse
- Rectocele

Anal disease
- Anal stricture
- Incomplete
- Hirschsprung's disease (hereditary)
- A

**Hormonal**

Pregnancy
Diabetes
Abnormalities of thyroid or parathyroid function

**Neurological**

Multiple sclerosis
Stroke
Spinal cord injury

**Table 1**

**Medications That May Cause Constipation**

Antacids that contain aluminum or calcium
Iron supplements
Opiate-type pain medications (e.g. Percocet, Percodan, Lortabs, Darvocet)
Antidepressants
Antiparkinson drugs
Medications to treat high blood pressure
- Calcium channel antagonists (e.g. Linosopril, Vasotec, Capoten)
- Clonidine

Diuretics ("water pills") that cause potassium loss
Nasal decongestants and antihistamines

**Table 2**

*Laxatives* act by stimulating colonic water and electrolyte secretion. So-called surface-acting agents or stool softeners, which include docusate salts (Colace, Surfak), are surfactant fatty acids that may also provide some lubricating function. They are poorly named since they primarily work by stimulating colonic secretion and may cause diarrhea. These products may be useful for short-term therapy (1 - 2 weeks) where straining at defecation is to be avoided, as in acute anal discomfort, after rectal surgery, or during pregnancy. In our experience, however, they are not potent agents and have little value in treating chronic constipation long term.

*Osmotic agents* include magnesium salts (Milk of Magnesia, magnesium citrates, Maalox, Mylanta), phosphate salts (Fleets Phospho Soda), disaccharides like lactulose (Chronulac, Cephulac), polyethylene glycol (Miralax), and glycerine. Polyethylene glycol (PEG) and lactulose belong to the category of poorly absorbed or nonabsorbed substances that increase the secretion of water into the intestine. They are fast-acting and are available for both oral and rectal administration. Glycerin suppositories, which are useful in children and the elderly, promote defecation by stimulating evacuation by drawing water rapidly into the gut. Glycerin also lubricates the stool and eases passage. Osmotic agents are generally reserved for patients who are bedridden and those not able to use bulk-forming agents. Caution is advised against use of osmotic agents in patients who are easily dehydrated (elderly, cardiac failure) or with potential for phosphate or magnesium toxicity (i.e., renal failure).

Considerable evidence has accumulated that lactulose and PEG are effective in the short-term treatment of constipation (8 weeks or less). However, evidence for long term use is somewhat lacking. When rapid cleanout is desired, *colonic lavage solutions* (Colyte, Golytely, Nulytely) containing polyethylene glycol may be administered. However, these solutions are best suited for purging the bowel prior to colonoscopy examinations.

*Contact-agents*, also known as *stimulant laxatives*, stimulate both water and electrolyte secretion and a vigorous pattern of intestinal contraction. These laxatives

consist of the anthraquinone derivatives (cascara, sennosides, and casanthrol), the diphenyl-methane derivatives (bisacodyl), and castor oil. Melanosis coli is a reversible brown-black pigmentation of the intestinal mucosa which is common in individuals who are chronically dependent on anthraquinone derivatives. Chronic use of stimulant laxatives has been reported to injure the neuromuscular plexuses of the colon leading to cathartic colon, a syndrome characterized by colonic dilatation, loss of haustration (muscles), worsening bowel function, and increasing laxative dependency over time. However, a direct cause and effect relationship remains controversial.

Stimulant laxatives should normally be reserved for severe episodes of constipation or failure of other regimens and are contraindicated for long-term use. Patients with a long-standing history of laxative abuse should be encouraged to discontinue them on a gradual basis.

The value of *enemas* and manual disimpaction should not be ignored. If there is significant stool in the rectosigmoid, forceful cleanout by any of the above agents may result in significant abdominal distention. Clean out of an impacted rectosigmoid by enemas or disimpaction should be considered the first step in the treatment of the chronically constipated or institutionalized patient. Tap water and phospho-soda (Fleets) enemas appear to have equal results. The volume of the enema can be estimated by the extent of impaction. Soap suds enemas should not be used since they have been shown to cause colitis.

*Lubricating agents* such as mineral oil are a simple and inexpensive yet effective alternative to many laxative regimens, particularly when pelvic outlet obstruction is suspected. Mineral oil is particularly useful in elderly patients and in individuals receiving opiates for pain. In impacted or severely constipated individuals, treatment is initiated with one tablespoon four times per day. One to two tablespoons per day will generally suffice on a chronic basis. Because of the potential danger of aspiration, caution must be exercised in giving mineral oil to bedridden individuals or in patients with swallowing difficulties secondary to strokes or other neurologic impairments. Chronic use of mineral oil has been reported to cause malabsorption of selected vitamins but this has been seen only in children ingesting mineral oil with meals. It is therefore recommended that mineral oil be given between meals if used on a regular basis.

One of the newer agents in the treatment of constipation is lubiprostone, which was approved for use in the U.S. in February 2006. Lubiprostone (Amitiza) is a *chloride channel activator* that enhances fluid and electrolyte secretion in the gut. It bears similarities to a class of endogenous substances called prostaglandins. Clinical trials have demonstrated that lubiprostone rapidly and significantly increased bowel movement frequency and decreased the degree of straining in constipated individuals.

Linaclotide (Linzess), a guanylate cyclase type-C (GC-C) agonist, was approved by the FDA in December 2012 to treat chronic constipation (and irritable bowel syndrome with constipation) in adults aged 17 and older. In studies, patients taking Linzess experienced improvement in multiple symptoms including pain or discomfort, bloating, and bowel function.

*Biofeedback* is becoming a popular treatment modality for constipation associated with pelvic floor dysfunction. The biofeedback sessions can include the monitoring of relaxation of the puborectalis muscle and external anal sphincter. Biofeedback has shown success in treating anorectal outlet obstruction, suggesting that the condition is possibly an acquired, abnormal learned response.

The role for *surgery* in chronic constipation is controversial. Surgery is an infrequent option in selected patients and should be advised with caution. Total removal of the colon is a possible option in a small subset of patients who have failed conservative management for documented colonic inertia, but a comprehensive anorectal physiologic investigation is mandatory prior to any surgical intervention. Surgery for pelvic floor dysfunction involving division of the puborectalis muscle has not been promising since patients fail to improve and are often left with significant side effects. Abnormalities associated with constipation that are successfully corrected by surgical means include classic Hirschsprung's disease and rectoceles.

**About IFFGD**

The International Foundation for Gastrointestinal Disorders (IFFGD) is a 501(c)(3) nonprofit education and research organization. We work to promote awareness, scientific advancement, and improved care for people affected by chronic digestive conditions. Our mission is to inform, assist, and support people affected by gastrointestinal disorders. Founded in 1991, we rely on donors to carry out our mission. Visit our website at: www.iffgd.org. www.aboutConstipation.org. www.aboutIBS.org. or www.YouandConstiation.org

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