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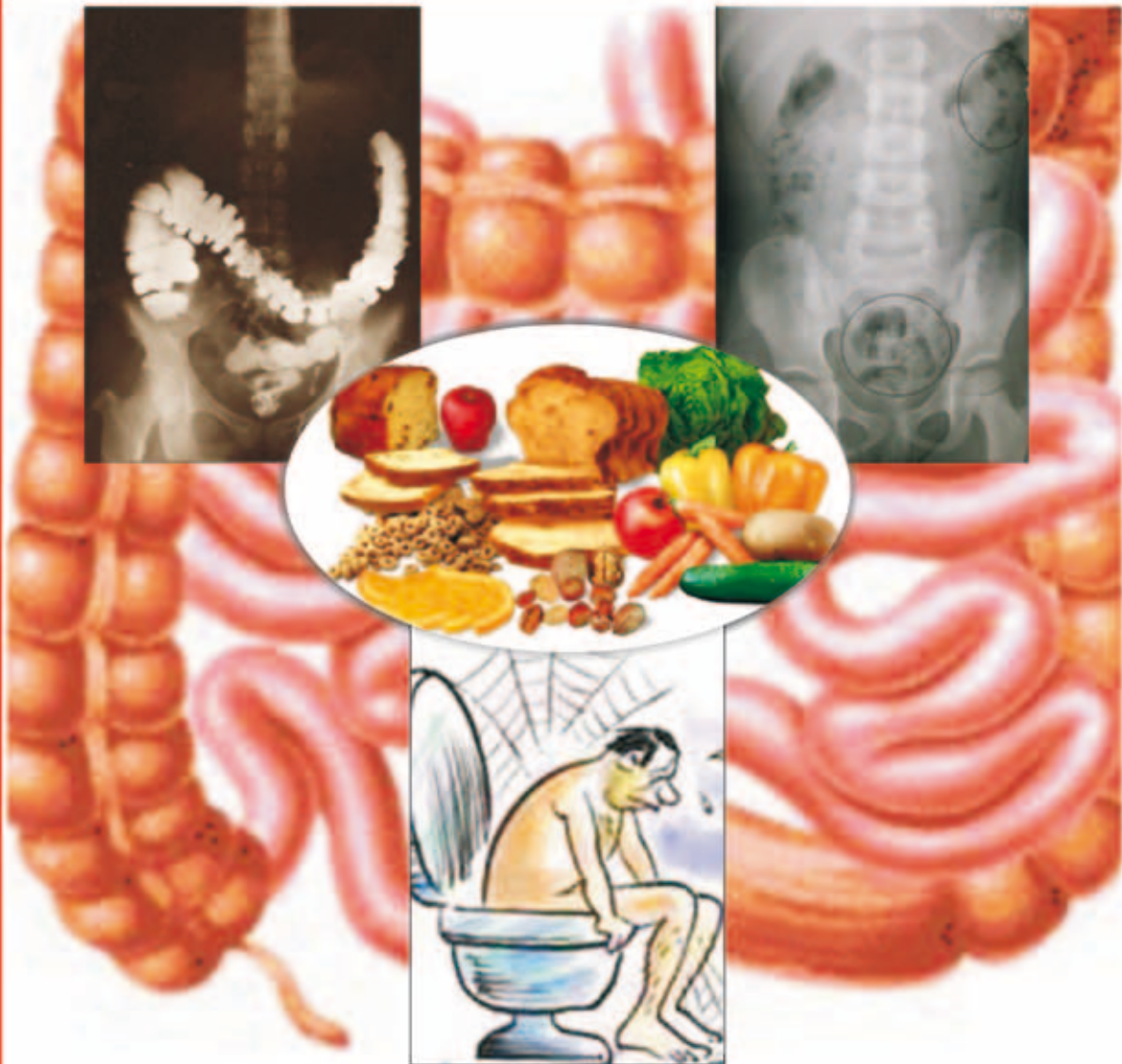


QUARTERLY MEDICAL REVIEW

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Review: Constipation



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CONSTIPATION

Introduction

Constipation (constipate = press together) is characterized by infrequent, incomplete evacuation of hard, dried stools. It is the most common physiological disorder of the intestine. Because of the wide range of normal bowel habit, constipation is difficult to be defined precisely. From a medical perspective, constipation is often defined as a frequency of less than 3 bowel movements a week. However, stool frequency alone is not a sufficient criterion for the diagnosis of the constipation because many constipated individuals describe the frequency of defecation to be normal but have subjective complaints of excessive straining, hard stools, lower abdominal fullness a sense of incomplete evacuation, bloating and non-specific ill localized abdominal discomfort or any other "difficulty with defecation".

Constipation is a frequent concern in older adults and accounts for the increase of health care stress and substantial proportion of health-care dollars are spent on over-the-counter medications. More than half of population beyond the age of 60 report constipation and regular use of laxatives. Though the frequency of bowel movements is same in all age groups, use of laxatives is more common in the elderly, even if they are not having infrequency of stools. The perception of hard stools or excessive straining is more difficult to assess objectively, and the need for the enemas or digital dis-impaction is a clinically useful way to corroborate the patient's perceptions of difficult defecation.

Constipation may be primary, if there is no obvious reason, or secondary, resulting from altered bowel function because of metabolic abnormalities, medications, mechanical factors causing obstruction or insufficient diet. Chronic constipation indicates that the symptoms have been present for more than 3 months. If chronic constipation is not responsive to the usual treatments, it requires further investigation for evidence of slow transit constipation also known as pelvic outlet dysfunction. Constipation can be part of irritable bowel syndrome (IBS), a new onset of IBS occurs less frequently in elders than in younger patients.

Since constipation is a symptom rather than a disease, definition of constipation has been differently defined from different angles as below:

Source	Definition
Physician	Infrequency of bowel movement
Patient	Straining, hard or lumpy stools, inability to defecate on demand, feelings of incomplete evacuation, abdominal bloating, infrequent defecation and unproductive urges.
Rome I criteria for Functional constipation	> 2 of the following for at least 3 months. Straining at defecation at least 25% of the time Lumpy or hard stool or both at least 25% of the time Sensation of incomplete evacuation at least 25% of the time < 2 bowel movements per week.

Rome II criteria for Functional constipation

At least 12 weeks, which need not be consecutive, in the preceding 12 months of >2 of the following:
 Straining in >25% of bowel movements
 Hard or lumpy stools in >25% of bowel movements
 Sensation of incomplete evacuation in >25% of bowel movements
 Sensation of anorectal obstruction / blockade in >25% of bowel movements
 Manual manoeuvres to facilitate >25% of bowel movements (digital disimpaction)
 < 3 bowel movements per week
 Loose stool is not present and criteria for irritable bowel syndrome are not fulfilled

Rome III criteria for Functional constipation

Presence of > 2 of the following:
 Straining during >25% of defecations
 Lumpy or hard stools in > 25% of defecations
 Sensation of incomplete evacuation for >25% of defecations
 Sensation of anorectal obstruction / blockade for >25% of defecations
 Manual manoeuvres to facilitate >25% of defecations (digital manipulations, pelvic floor support)
 < 3 evacuations per week
 Loose stools are rarely present without the use of laxatives
 insufficient criteria for irritable bowel syndrome
 Criteria fulfilled for the last 3 months and symptom onset > 6 months prior to diagnosis

Dorland's Medical Dictionary

Infrequent of hard stool or difficulty passing stool.
 Constipation may involve pain during a bowel movement, inability to pass stool after straining or pushing for >10 minutes, or no bowel movements after >3 days

American Gastroenterological Association

Symptom-based disorder defined as unsatisfactory defecation and characterized by infrequent bowel movement difficult stool passage or both. Difficult stool passage includes straining, sense to defecate or pass stool or need for manual manoeuvres to pass stool.

American College of Gastroenterology

Symptom-based disorder defined as unsatisfactory defecation and characterized by infrequent bowel movement, difficult stool passage, or both. Difficult stool passage includes straining, prolonged time to defecation or passage of stool, or need for manual manoeuvres to pass stool.

Chronic constipation is defined as the presence of these symptoms for >3 months

Classification of constipation

Description	Definition
Severity	
Mild	>1 bowel movement per week
Severe	<1 bowel movement per week
Duration	
Acute	Constipation lasting < 3 months
Chronic	Constipation lasting >3 months
Types	
Primary (idiopathic or functional)	Resulting from colon dysfunction
Secondary	Resulting from causes other than colon dysfunction (e.g. physical obstruction of gastrointestinal tract, drug adverse effects, fluid restriction)
Causes	
Slow transit	Constipation resulting from dysfunction of local intrinsic reflex mechanisms in the colon
Pelvic floor hypertonicity	Constipation resulting from hypertonicity of the anal sphincter and muscles used for stool evacuation

In clinical practice the term constipation is used to denote four types:

1. Colonic stasis (A. Atonic constipation B. Slow transit constipation)
2. Rectal stasis (Dyschezia)
3. Irritable bowel syndrome (Spastic constipation)
4. Obstructive constipation

A. Atonic Constipation:

The desire to defecate is caused by the entry of feces which has accumulated in the pelvic colon into the rectum. The passage of feces from the pelvic colon to the rectum is brought about by a mass peristalsis of the colon, which is stimulated by the physical activities after getting up in the morning or by the intake of water, liquids and food. Atonic constipation is commonly due to (1) inadequate intake of roughage in the diet, (2) inadequate water intake, (3) lack of physical exercise and (4) weakness of the voluntary muscles of defecation (the abdominal muscles and the muscles of pelvic floor). Treatment comprises of correction of faulty habits and prescribing right type of diet.

Correction of faulty habits:

The tendency to develop constipation usually starts in childhood as many children avoid answering

nature's call due to laziness, lack of time or lack of proper toilet facilities. Once the reflex for defecation is suppressed in the morning, it will be again felt only in the evening or night. The continued suppression of the urge to defecate is the basis of constipation. Worry, anxiety and fatigue are other factors, which affect adversely the normal rhythm of evacuation. The subjects should be advised to make it a practice to answer nature's call in the morning. Persons leading sedentary lives develop constipation more often than active persons. They should be advised to do regular physical exercises for the development of abdominal muscles.

Right type of diet:

The diet should contain foods, which are such sources of unavailable carbohydrates, e.g. whole cereals and pulses, vegetables and fruits. The composition of the diet and the daily menu for the treatment of atonic constipation are given below.

B. Slow transit Constipation:

Slow transit constipation is a delayed colorectal transit time and is usually measured with a radio-opaque marker study in which different shaped markers are ingested and their progress followed on serial abdominal radiography. Slow transit constipation may occur after pelvic trauma, usually either surgery or complicated childbirth or may be idiopathic. The exact pathophysiology behind idiopathic cases is not known, although neuropathy, colonic myopathy or mesenchymopathy have been proposed.

Stimulant laxatives are a logical initial treatment but we were unable to find evidence for the success or otherwise of this intervention. Reports of small numbers of cases with isolated slow transit constipation and successful biofeedback therapy do exist.

Self administered antegrade colonic enemas may be possible if access to the proximal colon is fashioned usually by exteriorising the appendix as a stoma providing access for the patient to self administer antegrade enemas. Subtotal colectomy with ileorectal anastomosis has remained the intervention of choice for slow transit constipation that is unresponsive to other approaches.

C. Irritable bowel syndrome:

IBS is a common gastrointestinal disorder that affects nearly 20% of the population worldwide; there is altered bowel habit, intermittent abdominal pain, loose motion, sometimes alternating with constipation. The pathology of constipation is intestinal spasm, therefore the name is spasmodic constipation. At first constipation may be episodic but eventually becomes continuous and increasingly intractable to treatment with laxatives. Stools are usually hard, narrowed calibre possibly reflecting excessive dehydration caused by prolonged colonic retention and spasm. However, most patients experience a sense of incomplete evacuation for which they have to frequently visit the toilet to attempt defecation. Depending on the frequency of motion, IBS has been divided into IBS with predominant diarrhoea and IBS with predominant constipation, though most patients experience diarrhoeal episodes alternating with constipation. Patients of IBS predominant constipation have weeks to months of constipation interrupted with brief episodes of diarrhoea. Bleeding with constipation is not a feature of IBS except in cases of hemorrhoids or malignancy.

D. Obstructive Constipation or obstructed defecation :

Obstructed defecation is a broad term for a pathophysiological condition describing the inability to evacuate contents from the rectum. The causes may be anatomical or functional. Anatomical causes include ultrashort segment Hirschsprung's disease, rectocele, intussusception, enterocele, sigmoidocele and perhaps genital prolapse. Functional causes have confusing and varied nomenclature. The basic pathology behind these conditions is rectoanal neuromuscular malcoordination (anismus, paradoxical puborectalis contraction, pelvic floor dyssynergia). Symptoms include a feeling of incomplete evacuation, passage of hard stools, the need to self digitate rectally or vaginally, a need for laxative or enema for defecation, rectal discomfort, excessive straining and repeat visits to defecate. In some patients, symptoms of faecal or urinary incontinence may coexist. Vaginal and rectal examination is necessary to assess for presence of a rectocele, perineal descent, apical vaginal prolapse, cystocele, full thickness rectal prolapse, and rectal mucosal ulceration. Common investigations are anorectal manometry (including a balloon expulsion test) to assess neuromuscular coordination and power and defecating proctography. Dynamic magnetic resonance imaging of the pelvic floor and colonic transit time studies may be required. Conservative treatment includes a high fibre diet, adequate hydration, regular physical activity, enemas, laxatives and rectal irrigation. Behavioural therapy with biofeedback training to teach patients to relax their pelvic floor can be useful. The effectiveness and duration of the effects are variable but the therapy has low morbidity.

Complications associated with severe constipation

Fecal impaction is the major complication and it can be life threatening. Fecal impaction can cause cognitive problems, malaise, fatigue, urinary retention, bowel and urine incontinence, anal fissure, hemorrhoids, stercoral ulcer and intestinal obstruction. Watery diarrhoea can occur around impacted stool, leading to use of antidiarrhoeal agents and further complicating the problem. A mass of stool in the rectum can impair sensation and lead to the need for larger volumes of stool to stimulate the urge to defecate. Constipated patients, especially those who have chronically abused laxatives can develop megacolon and volvulus. Straining during defecation affects cerebral and coronary circulation and can cause transient ischemic attacks and syncope, especially in the frail elderly. Finally, chronic constipation is a risk factor for colon and rectal carcinoma.

Psycho social factors play a great role in the concept of constipation. A person whose parents attach great importance to daily defecation will become greatly concerned when he or she misses a daily bowel movement; some children withhold stool to gain attention and some adults are simply too busy or too embarrassed to interrupt their work when the call to have a bowel movement is sensed.

Epidemiology

The prevalence of self-reported constipation, physician visits and laxative use increases with aging while the prevalence of stool frequency does not change with age. Harari et al reported a 10-fold increase in self reported constipation in men from 0.6 to 6.3% from age 40 to 80 years and an approximately 3-fold increase in women from 5 to 11%. They reported laxative use in about 30%

of both elderly men and women without any significant decrease in bowel frequency. There is some evidence suggesting that lack of fibre intake, inactivity and lack of fluid intake may contribute to constipation in otherwise healthy older people. Women reported fewer bowel movements than did men and nonwhites and people of lower socio-economic class also reported fewer bowel movements.

In frail elders, up to 45% reported constipation as a health issue. The prevalence of constipation is higher in nursing home residents, a finding not well explained by the increased use of laxatives, but it could be explained by more frequent use of medications and other comorbidities during institutionalisation.

Physiology of defecation

The normal process of fecal evacuation begins with propulsion of the fecal matter through the colon. This is accomplished by high amplitude propagated contractions (HAPCs) that occur several times during the day, occurring more frequently in infants and decreasing to 24 per day in adults. In addition to the high amplitude contractions, an increase in motility of the colon following a meal, the gastrocolic reflex, also helps to propel stool along the colon to the rectum, where it is stored until appropriate conditions are present for voluntary evacuation. At the rectum, the mechanism for storage and evacuation of the fecal material is a complex process.

The puborectalis muscle embraces the rectal neck and forms an angle, the anorectal angle, with the internal and external anal sphincters surrounding the anal canal. This angle, at rest, is 85-105° and supports much of the weight of the fecal mass in the rectum, relieving the sphincters of the bulk of this pressure. Distension of the rectum causes a reflex relaxation of the internal anal sphincter and contraction of the rectal detrusor muscles. If defecation is desired, the puborectalis and levator ani muscles are relaxed, straightening the anorectal angle. Straining increases the intraabdominal pressure and results in evacuation of feces. If defecation is not desired, contraction of the external anal sphincter prevents fecal loss until the rectal wall adapts to the increasing volume.

Pathophysiology

1. Disruption of the normal physiology of defecation leads to constipation.
2. Defective or impaired sensation or outlet obstruction
3. Constipation may, therefore, result from defective or impaired propulsion

Causes of Constipation

Chronic constipation generally results from inadequate fibre intake or from disordered colonic transit or anorectal function as a result of a neurogastroenterologic disturbance, certain drugs, and in association with a large number of systemic diseases that affect the gastrointestinal tract. Constipation of recent onset may be a symptom of significant organic disease such as tumor or stricture. In idiopathic constipation, a subset of patients exhibit delayed emptying of the ascending and transverse colon with prolongation of transit (often in the proximal colon) and a reduced frequency of propulsive colonic contractions. Outlet obstruction to defecation (also called evacuation disorders) may cause delayed colonic transit, which is usually corrected by biofeedback retraining

of the disordered defecation. Constipation due to any cause may be exacerbated by chronic illnesses that lead to physical or mental impairment and result in inactivity or physical immobility.

Causes of constipation in all age groups

Types of constipation and causes Examples

Recent onset

Colonic obstruction	Neoplasm: stricture: ischemic, Diverticular inflammatory, Congenital malformations
Anal sphincter spasm	Anal fissure, painful hemorrhoids, foreign bodies.
Medications	Discussed in Table - 2

Chronic

Irritable bowel syndrome	Constipation-predominant, alternating with Diarrhoea
Medications	
Colonic pseudo-obstruction	Slow transit constipation megacolon (rare Hirschsprung's, Chagas disease)
Disorders of rectal evacuation	Pelvic floor dysfunction, anismus, descending perineum syndrome, rectal mucosal prolapse, rectocele
Endocrinopathies	Hypothyroidism, hypercalcemia, pregnancy
Psychiatric disorders	Depression, eating disorders
Neurologic disease	Multiple sclerosis, spinal cord injury, Parkinsonism,
Generalized muscle disease	Progressive systemic sclerosis, congenital muscular disorders

Table - 2

Medications causing constipation

Aluminum	: Antacids, sucralfate
Anticonvulsants	: Phenytoin, carbamazepine, phenobarbital
Antidepressants	: Amitriptyline, nortriptyline, venlafaxine
Antihistamines	: Diphenhydramine, chlorpheniramine
Antihypertensives	: Acebutalol, prazosin
Antilipemics	: Cholestyramine, colestipol
Antiparkinsonian drugs	: Bromocriptin, sinemet, amantadine, benzotropine, pramipexole
Antipsychotics	: Haloperidol, risperidone, thiothixene
Antispasmodics	: Oxybutynin, opiate or barbiturate compounds
Bismuth	: Pepto-Bismol, Rectacort
Calcium	: Antacids, supplements (calcium carbonate)
Diuretics	: Hydrochlorothiazide, furosemide, indapamide
Ganglionic blockers	: Trimethaphan
Iron supplements	
Laxative misuse	
NSAIDs	: Naproxen, sulindac, ketoprofen
Opiates	: Codeine, morphine, oxycodone
Phenothiazines	: Thioridazine, chlorpromazine, perphenazine
Sedatives	: Diazepam, flurazepam

Table - 3**Causes of constipation predominant in elderly age group**

For most elderly individuals, there are likely to be multiple contributing factors:

Dietary

Inadequate caloric intake
 Poor fluid intake
 Low-fibre diet
 High-fat diet
 Refined foods
 Poor dentition
 Swallowing problems
 Tube feedings

Psychological

Depression
 Confusion
 Emotional stress

Functional

Inadequate toileting
 Poor bowel habits
 Weakness
 Immobility/lack of exercise

Colonic/anorectal disorders

Ischemia
 Postsurgical obstruction
 Rectocele or rectal prolapse

Colonic/anorectal disorders

Tumors
 Volvulus or megacolon
 Barium or bezoars
 Fissures or hemorrhoids
 Fistule or abscess
 Radiation fibrosis
 Stricture
 Prostatic enlargement
 Diverticulosis

Neurogenic disorders

Spinal cord lesions
 Parkinson's disease
 Cerebrovascular accidents
 Dementia

Endocrine/metabolic disorders

Diabetes
 Hypothyroidism
 Hyperparathyroidism
 Hypokalemia
 Hypercalcemia

Diet for an adult suffering from constipation (gm/capita/day)

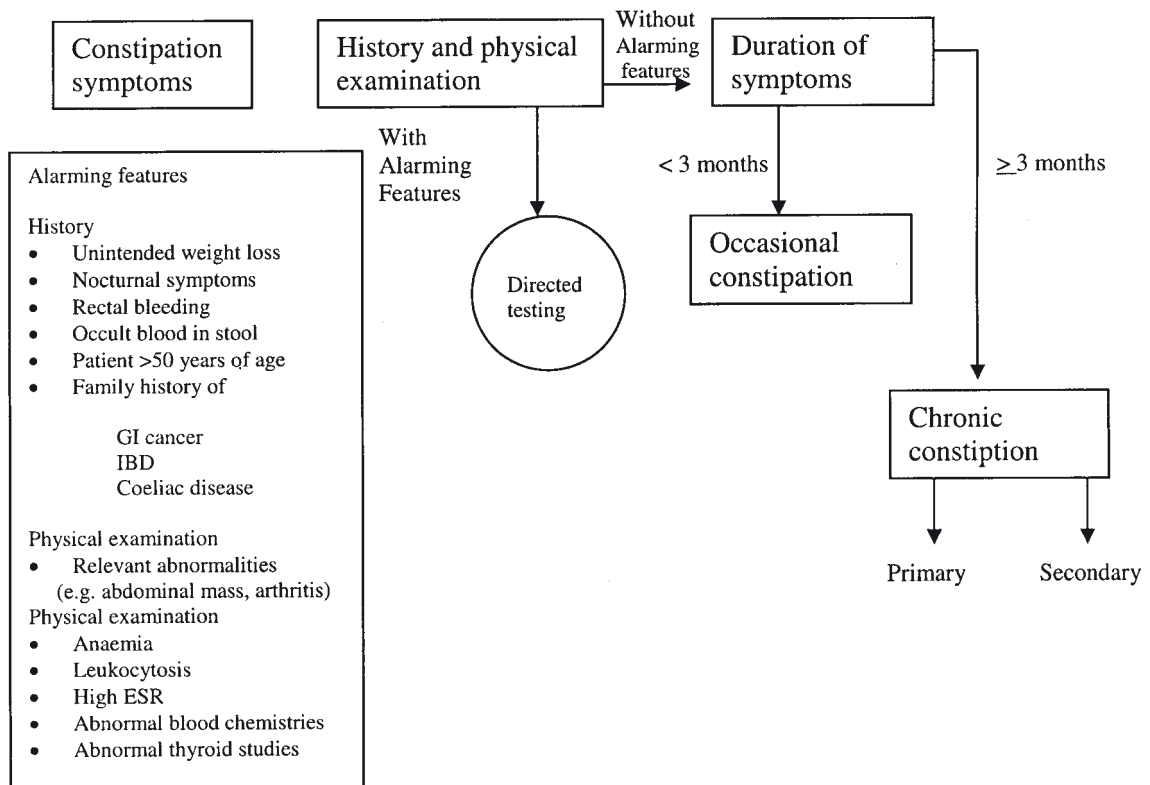
Foodstuffs	Vegetarian	Non-vegetarian
Whole cereals	400	400
Whole legumes Bengal gram, cow pea, peas and field bean	100	100
Dhals	40	40
Milk	500	300
Meat	–	–
Eggs	–	–
Green leafy vegetables	100	100
Other vegetables	200	200
Roots and tubes	100	100
Fruits (guava or apple or banana)	100	100
Oils and fats	50	50
Sugar and jaggery	40	40

One multivitamin tablet providing the daily requirements of all vitamins should be taken

Table - 4
Dietary factors causing constipation

1. Lack of fluids. In the tropics, where perspiration is profuse and an adequate amount of fluid is not taken. Water is more completely reabsorbed in the colon. This leaves a small quantity of hard, dry feces which, does not produce enough distension to initiate reflex evacuation.
2. Lack of roughage. Faulty food habits include irregular hours of meals, taking inadequate bulk, fasting and avoiding foods containing un-absorbable cellulose in the form of vegetable fibre. This leaves little residue for evacuation.
3. Irregular habit. Irregular bowel habits may be due to getting up late in the morning and rushing through the morning rituals with very little time for a visit to the toilet before going to school or office. For those living in chawls and sharing common bathrooms, the bathroom may not be available whenever there is an urge to evacuate or the unhygienic conditions prevailing may make a visit undesirable.
4. Purgation or enema. The constant use of artificial aids for evacuating the bowels results in the loss of natural reflexes and tone of the bowel.
5. Lack of potassium. Lack of potassium either due to poor intake or due to loss with purgation, can cause atony and constipation.

DIAGNOSING CHRONIC CONSTIPATION



Approaching a patient with constipation

A specific cause for constipation symptoms can be identified in some patients, commonly referred to as secondary causes, these may include underlying organic disease (metabolic, neurological), structural abnormalities (as a result of previous surgery), use of select medications (e.g. opioids), and lifestyle habits (e.g. poor eating habits, lack of exercise). Other patients, however, have no diagnostic markers, structural abnormalities or physical findings to explain the presence of constipation associated symptoms. This is known as primary or idiopathic constipation and is typically subcategorised into three groups: normal transit where the rate of transit of stool through the colon is normal, but patients experience difficult stool passage or have hard stools; slow transit where colonic stool transit is delayed; and pelvic floor dysfunction (also known as pelvic floor dyssynergia and obstructed defecation). Pelvic floor dysfunction is characterized by a failure to coordinate actions of the puborectalis muscle and anal sphincter during defecation. Feelings of incomplete evacuation and straining are key features. Structural or functional abnormalities (e.g. rectal prolapse, rectocele, anismus) dysfunction. In many patients importantly, at any given time, one or more of these three mechanism may contribute to a patient's symptoms.

A careful history should be taken to confirm whether he or she is indeed constipated based on frequency (e.g. fewer than three bowel movements per week), consistency (lump/hard), excessive straining, prolonged defecation time, or need to support the perineum or digitate the anorectum. In the vast majority of cases (probably > 90%), there is no underlying cause (e.g. cancer, depression or hypothyroidism), and constipation responds to ample hydration, exercise, and supplementation of dietary fibre (15 to 25 g/d). A good diet and medication history and attention to psychosocial issues are key. Physical examination and, particularly, a rectal examination should exclude most of the important diseases that present with constipation and possibly indicate features suggesting an evacuation disorder (e.g. high anal sphincter tone). There is board consensus on the selection of patients for further investigation. The presence of weight loss, rectal bleeding or anaemia with constipation mandates either sigmoidoscopy plus barium enema or colonoscopy alone, particularly in patients > 40 years, to exclude structural diseases such as cancer or strictures. Colonoscopy alone is most cost effective in this setting since it provides an opportunity to biopsy mucosal lesions, perform polypectomy or dilate strictures. Barium enema has advantages over colonoscopy in the patient with isolated constipation, since it is less costly and identifies colonic dilatation and all significant mucosal lesions or strictures that are likely to present with constipation. Melanosis coli, or pigmentation of the colon mucosa indicates the use of anthraquinone laxative such as cascara or senna; however, this is usually apparent from a careful history. An unexpected disorder such as megacolon or cathartic colon may also be detected by colonic radiographs. Measurement of serum calcium and thyroid stimulating hormone levels will identify rare patients with metabolic disorders.

Patients with more troublesome constipation may not respond to fibre alone and may be helped by a bowel training regimen: taking an osmotic laxative and evacuating with enema or glycerine suppository as needed. After breakfast, a distraction-free 15 to 20 min on the toilet without straining is encouraged. Excessive straining may lead to development of hemorrhoids, and, if there is weakness of the pelvic floor or injury to the pudendal nerve, may result in obstructed defecation from descending perineum syndrome several years later. Those few who do not benefit from the simple

measures delineated above or require long-term treatment with stimulant laxatives with the attendant risk of development laxative abuse syndrome are assumed to have severe or intractable constipation and should have further investigation.

Investigations:

A small minority of all patients with constipation have cases that are considered severe or "intractable"; these are the patients most likely to be seen by gastroenterologists or in referral centres. Further observations of the patient may occasionally reveal a previously unrecognised cause, such as an evacuation disorder, laxative abuse, malingering, or psychiatric disorder. In these patients, recent studies suggest that evaluations of the physiologic function of the colon and pelvic floor and of psychological status aid in the rational choice of treatment. Even among these highly selected patients with severe constipation, a cause can be identified in only about 30% cases.

Measurement of Colonic Transit: Radiopaque marker transit tests are easy, repeatable, generally safe, inexpensive, reliable and highly applicable in evaluating constipated patients in clinical practice. There are several validated methods that are very simple. For examples, radiopaque markers are ingested and an abdominal flat film taken 5 days later should indicate passage of 80% of the markers out of the colon. This test does not provide useful information about the transit profile of the stomach and small bowel and avoidance of laxatives or enemas during the testing period is essential.

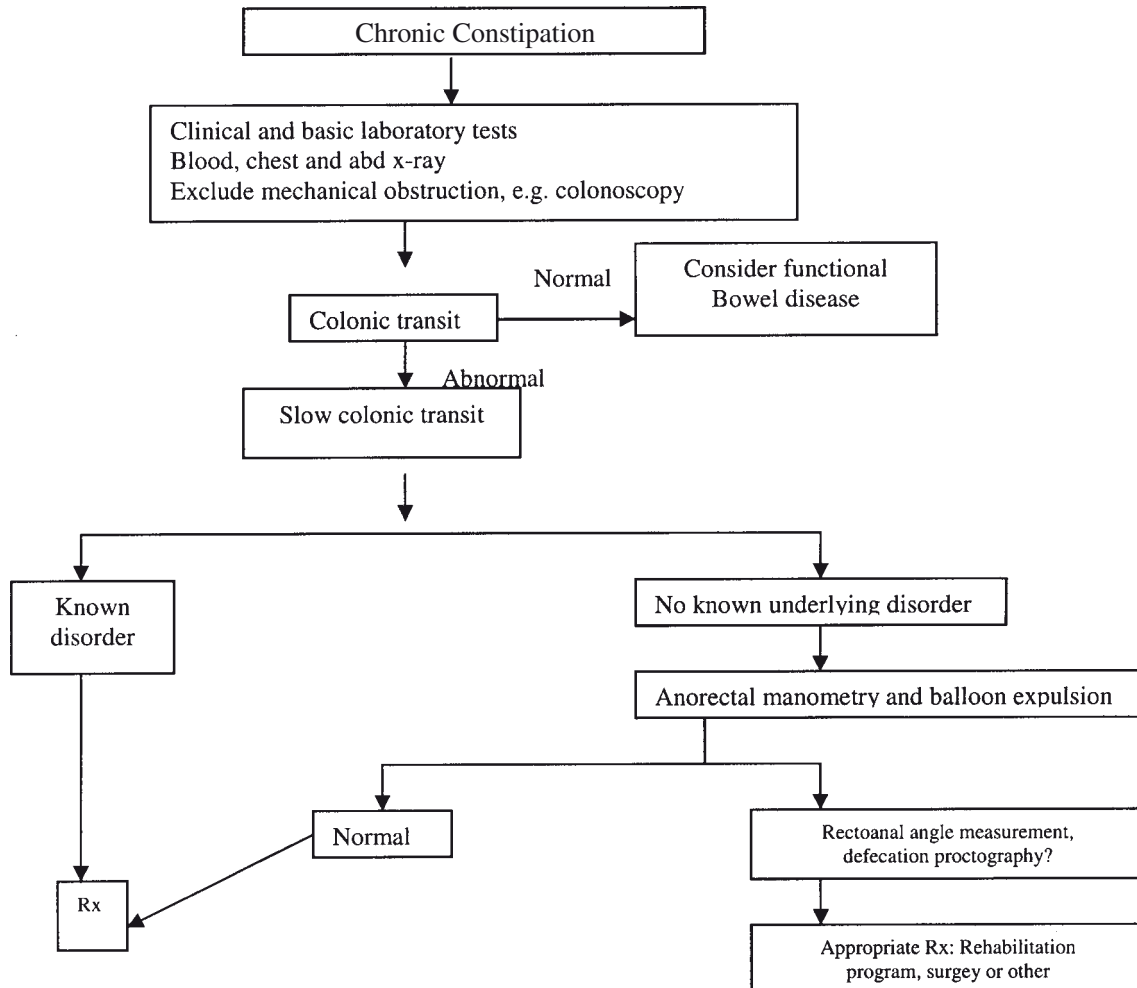
Radioscintigraphy with a delayed-release capsule containing radio-labeled particles has been used to noninvasively characterize normal, accelerated or delayed colonic function over 24 to 48 hours with low radiation exposure. This approach simultaneously assesses gastric, small bowel and colonic transit. The disadvantages are the greater cost and the need for specific materials prepared in a nuclear medicine laboratory.

Anorectal and pelvic floor tests: Pelvic floor dysfunction is suggested by the inability to evacuate the rectum, a feeling of persistent rectal fullness, rectal pain, the need to extract stool from the rectum digitally, application of pressure on the posterior wall of the vagina, support of the perineum during straining and excessive straining. These significant symptoms should be contrasted with the sense of incomplete rectal evacuation, which is common in irritable bowel syndrome. Patients with clinically suspected obstruction of defecation should also be evaluated by a psychologist to identify eating disorders or a "need to control", to provide stress management or relaxation training and to identify depression. A simple clinical test in the office to document a non-relaxing puborectalis muscle is to have the patient strain to expel the index finger during a digital rectal examination. Motion of the puborectalis posteriorly during straining indicates proper coordination of the pelvic floor muscles.

Measurement of perineal descent is relatively easy to gauge clinically by placing the patient in the left decubitus position and watching the perineum to assess either paucity or lack of descent (<1.5 cm, a sign of pelvic floor dysfunction) or perineal ballooning during straining relative to bony landmarks (> 4 cm, suggesting excessive perineal descent). A useful overall test of evacuation is the balloon expulsion test. A urinary catheter is placed in the rectum, the balloon is inflated to 50

mL with water and a determination is made about the cubitus position. In the lateral position, the weight needed to facilitate expulsion of the balloon (normal, 0 to 200 g) is determined. Anorectal manometry is not often contributory in the evaluation of patients presenting with severe constipation, except when an excessively high resting or squeeze anal sphincter tone suggests anismus (anal sphincter spasm). This test also identifies rare syndromes, such as adult Hirschsprung's disease, by the absence of the rectal inhibitory reflex or the presence of occult incontinence. Defecography (a dynamic barium enema including lateral views obtained during barium expulsion) reveals "soft abnormalities" in many patients; the most relevant findings are the measured changes in rectal angle, anatomic defects of the rectum and enteroceles or rectoceles. In a very small proportion of patients, significant anatomic defects associated with intractable constipation respond best to surgical treatment. These defects include severe intussusception with complete outlet obstruction due to funnel-shaped plugging at the anal canal or an extremely large rectocele that is preferentially filled during attempts at defecation instead of expulsion of the barium through the anus. In summary, defecography requires an interested and experienced radiologist, and abnormalities that are not pathognomonic for pelvic floor dysfunction. More commonly, outlet obstruction results from a non-relaxing puborectalis muscle, which impedes rectal emptying, rather than from defects identified by defecography.

Dynamic imaging studies such as proctography during defecation or scintigraphic expulsion of artificial stool help measure perineal descent and the rectoanal angle during rest, squeezing and straining and scintigraphic expulsion quantitates the amount of "artificial stool" emptied. Failure of the rectoanal angle to increase significantly ($\sim 15^\circ$) during straining confirms pelvic floor dysfunction. Neurologic testing (electromyography) is more helpful in the evaluation of patients with incontinence than of those with symptoms suggesting obstructed defecation. The absence of neurologic signs in the lower extremities suggests that any documented denervation of the puborectalis results from pelvic (e.g. obstetric) injury or from stretching of the pudendal nerve by chronic, long-standing straining. Ultrasonography identifies sphincter or rectal wall defects and may help select patients for surgical correction. Spinal-evoked responses during electrical rectal stimulation or stimulation of external anal sphincter contraction by applying magnetic stimulation over the lumbosacral cord identify patients with limited sacral neuropathies with sufficient residual nerve conduction to attempt biofeedback training.

ALGORITHM FOR THE MANAGEMENT OF CONSTIPATION

The elderly perceive constipation as the presence of hard stools and straining, which correlates with self-reported constipation in this population. Population-based studies reported constipation in 40% of community-dwelling older adults over the age of 64 years. The common risk factor for developing constipation in this population was the use of medication; i.e. non-steroidal anti-inflammatory drugs.

In one study 20 to 30% of community-dwelling older adults used laxatives on at least a weekly basis. In nursing homes, it was reported that 59% of the residents used laxative at least on an intermittent basis.

For most individuals one stool a day is necessary for good health and a feeling of well-being. Some may evacuate twice a day while a few, despite being in perfect health, may move every second or third day. In Western countries, three stools per week may be considered normal.

Bowel movement depends on the autonomic nervous system and the type of diet. A vegetarian diet with increased roughage content produces bulkier stools. An individual who does not take

adequate roughage and liquids may complain of constipation, but on sigmoidoscopy there may be no fecal matter in the lower bowel.

The weight of stool varies considerably. In Western populations the stool weight is low; the approximate weight in the UK is about 100 g/day and whole gut transit time is 60 hours. The fecal output increases with high intake of non-starch polysaccharide (dietary fibre); north Indian and African villagers have daily stool weights of 300 g and 400 g respectively. Propulsive movement of the colonic content is stimulated by physical activity and ingestion of food. On the other hand, long term inactivity and fasting produce constipation. Patients with ulcerative colitis and other causes of diarrhoea have maximum frequency on moving about in the morning, and benefit from rest. Entry of food into the upper small intestine increases colonic pressure activity; this explains the tendency of some normal persons to evacuate after breakfast, and in patients with diarrhoea and stomach surgery to evacuate after each meal. On sigmoidoscopy, the colon and rectum are empty for several hours if the patient fasts after morning defecation, but the colon may be loaded within a short time after taking a meal or tea.

It is a good practice to train infants in regular toilet habits, but overenthusiastic scrutiny of the frequency, quantity, colour and consistency of stools by an anxious mother lays the foundation for bowel neurosis, which persists through life. Added to this, unauthentic literature and quacks misinform the lay public that the large intestine is a cesspool of germs and toxins, and therefore should be cleansed regularly with purgatives, enemas, or bowel washes.

The normal intestinal bacteria are indispensable for health. They aid in bowel function, produce vitamins, and inhibit the growth of pathogenic organisms. Their value can be observed when there is prolonged use of oral antibiotics, which kills normal intestinal flora and results in diarrhoea (due to proliferation of harmful bacteria) and vitamin deficiency. Nature has designed the lower part of the colon for the storage of waste products of digestion prior to evacuation: this does not produce ill health.

Drastic purgatives, enemas and bowel washes should be avoided. The resulting liquid stools, with unabsorbed food and digestive juices, cause loss of fluids and the electrolytes sodium and potassium. In a susceptible person this may even precipitate thrombosis in the heart or in the brain.

"Happy is the man who lets his bowel function without interference, without the obsessive need for well-formed or liquid stools, or an evacuation after every meal or even every day". Many bowel-conscious patients strain after defecation in order to 'clean out the bowel'. This leads to irritation of the mucosal surfaces, inflammation and a foreign body sensation. The resultant mucus exudate increases mental agony and induces further straining to 'remove mucus'. Repeated straining produces piles and rectal prolapse, which may require surgery.

The obsession to 'clean the bowel' may prompt digital evacuation of the rectum. The tip of the finger nail traumatizes the rectal mucosa and subsequently results in an ulcer about 7-10 cm from the anal verge (the ulcer is higher than the length of the forefinger because during straining, the rectal mucosa prolapses downwards). The ulcer has a fibrous base and raised, red, edematous margins. The fibrous base prevents healing of the ulcer. The traumatized mucous membrane results in a feeling of incomplete evacuation (tenesmus) and a foreign-body sensation and further

attempts are made to strain and digitally remove this 'foreign body'. The inflamed mucosa also exudes mucus, giving credence to a diagnosis of 'mucus colitis'. This condition is prevalent in all cultures but is more so amongst Indians because the practice of digital evacuation has been sanctified as Ganesh Kriya.

Some drastic purgatives such as castor oil has proved to be harmful causing perforation of acute inflamed appendix, intestinal ulcerations and infected diverticula. It could aggravate the symptoms of intussusception or volvulus. Purgative therapy is self-sustaining, because it requires an increasing daily dose to produce results. Excessive intake of purgative results in a 'cathartic colon', producing diarrhoea, abdominal pain, thirst, low blood potassium and muscle weakness. Barium enema examination reveals a rigid pipe-like colon (mistaken as ulcerative colitis); sigmoidoscopy may show a pigmented colon (melanosis coli). Enemas and bowel washes are not harmless. Their habitual use leads to increasing constipation, as the natural reflexes are suppressed. After an enema, stool contains an increased amount of mucus; observation through a sigmoidoscope shows marked congestion of the colon and mucus secretion. The occasional use of an enema is not harmful. A low enema may be necessary to initiate an excretory reflex during an acute illness or before and after an operation. Similarly, a bowel wash is sometimes indicated as preparation for barium enema studies or surgery of the colon.

Constipation is found in all age groups, however, older adults treat constipation with over-the-counter products; thus, the economic impact of laxative use is likely considerably higher. At present there are no studies in the US addressing the economic aspect of laxative use. One study in the UK estimated the annual cost to the National Health Service for prescription laxatives at £43 million. The presence of chronic constipation impacts functioning in daily life and older adults affected by it rate their health lower than people without any gastrointestinal symptoms. Health-related quality of life is reduced in patients with chronic constipation. The presence of constipation has been hypothesized to increase urinary tract symptoms, with treatment of constipation resulting in reduced urinary frequency, urgency and dysuria. Constipation is also associated with fecal incontinence, fecal impaction and stercoral ulceration. Effective strategies are needed for reducing the burden of illness and cost associated with constipation.

FOOD ITEMS PERMITTED IN A PATIENT WITH CONSTIPATION

- Bread or chapattis of wheat, preferably from granary or wholemeal flour
- Breakfast cereals, preferably high-bran cereals or porridge oats
- Rice, preferably brown rice
- Pasta, preferably wholemeal
- Vegetables, preferably with skin
- Salad
- Potatoes, preferably with skin
- Meat, fish or chicken, Eggs
- Milk or milk products

- Cooking fat or butter
- Condiments and spices
- Papad, chutney and pickles
- Fruits, fresh, preferably with skin
- Fruits, dried
- Sugar, jaggery or honey
- Pastry
- Dessert or sweets
- Beverages
- Fluids, 8 - 10 glasses a day

SAMPLE MENU FOR A PATIENT WITH CONSTIPATION

Western diet		Vegetarian diet
	On rising	
A glass of warm water		A glass of warm water
	Breakfast	
High-bran cereal with dried/ Stewed fruit or prunes		Stewed figs, apricots
Wholemeal bread/toast with butter		Cornflakes
Jam/marmalade		Wholemeal toast or
Tea or coffee		chapattis made from brown flour
	Mid-morning	
Tea or coffee		Tea or coffee
Orange		Banana
	Lunch	
Cottage pie		Cooked mixed vegetables
Jacket potato with cheese		Tapioca pudding or vegetable curry with brown rice
	Mid-afternoon	
Tea or coffee		Tea or coffee
Crisp bread		Wholemeal crackers
	Dinner	
Asparagus soup		Lentil soup
Chicken		cooked cabbage and boiled potatoes
Green beans, Baked apple		Rice and dal or chapattis
Carrot cake (wholemeal flour)		made from brown flour
	Bed time	
Milk drink		Milk drink

Role of dietary fibre in constipation

Dietary fibre has been defined as the plant polysaccharides and lignin, which are resistant to hydrolysis by the digestive enzymes in human beings. The main components of dietary fibre are cellulose, hemicelluloses, hexosans (galactans and fructosans, etc.) pectic substances, gums, mucilages and lignin.

Types of Fibre present in Plant Foods

Source	Classification
Plant cell wall Structural (1) Polysaccharides (2) Non-carbohydrate polymer	Cellulose Hemicelluloses Hexosans (fructosans, gallactains etc.)
Non-structural substances and food additives	Pectic substances Pectin Gums Mucilages Modified polysaccharides

Food sources of various fibre components

Cellulose	Hemicellulose	Pectin
Whole wheat flour	Bran	Apples
Bran	Cereals	Citrus fruits
Cabbage family	Whole grains	Strawberries
Peas and beans	Gums	Lignin
Apples	Oatmeal	Mature Vegetables
Root vegetables	Dried beans	
Other legumes	Wheat	

Percentages of the fibre in most food items

Whole meal	Brown	White bread
8.5%	5.1%	2.7%
Leafy vegetables	Potato & root vegetables	Fruits
2.5% - 3.5%	1% - 2.5%	2.3%

Risk of diseases on low fibre diet

Colonic : Constipation, appendicitis, diverticular disease, hemorrhoids, polyps and cancer of large bowel, Irritable colon, ulcerative colitis.

Metabolic :	Obesity, diabetes mellitus, ischemic heart disease, peripheral vascular disease, varicose veins, deep vein thrombosis, pulmonary embolism, gallstones, kidney stones, rheumatoid arthritis, multiple sclerosis, senile osteoporosis, osteitis deformans (Paget's) pernicious anaemia, subacute combined degeneration of the cord, most varieties of thrombosis.
Endocrine:	Thyrotoxicosis, myxedema, Hashimoto's thyroiditis, Addison's hypoadrenalism.
Others:	Dental caries, hiatus hernia, Crohn's disease.

Hypertension and stroke are more common in population in high salt low fibre and low starch diet.

Effect of Fibre on Faecal Output and Intestinal Transit Time

Studies with elemental diets have demonstrated that man can live in good health for six months on a fibre-free diet. The notable changes observed were low faecal bulk and frequency. The effect of dietary fibre on faecal output and transit time of the faeces have been studied by several workers. It is observed that weight of faeces in children fed on whole meal bread was very much higher than that on white bread. This is evidently due to the high fibre content of the former reported that the dry weight of faeces in adults fed on whole ragi flour diet was twice as much that obtained on rice diet. This is due to the fact that ragi contains large amounts (13 to 16%) of dietary fibre. Intake of 50g of wheat bran daily has been reported to double the fecal weight in adult human. The transit time of faeces has been determined by various workers by two methods: (1) Using radio-opaque marker pellets as a stool marker and (2) Using dyes as stool markers. The majority of studies have used the former method. Transit time was computed as the time required for the passage of 80% of the pellets or as the average time the pellets take to pass through the gut, i.e. Mean Transit Time (MTT). The result obtained by various workers may be summarized as follows:

1. Pectin does not influence markedly the faecal bulk or transit time.
2. Cellulose and guar gum increase faecal bulk and decrease the transit time of faeces.
3. Wheat bran increases faecal bulk and decrease transit time of the faeces.

Absorption of starch of wheat flour, rice, beans and bananas is 80% - 95% and rest 5 - 20% are unabsorbed carbohydrates amounting to 70 g/day. It enters the large bowel where it is either digested to short chain fatty acids (SCFA) (acetic, butyric, propionic acids) which are absorbed for energy or undergo transformation by colonic flora to methane, hydrogen or carbon dioxide. Fibre is not digested by intestinal enzymes. Anaerobic intestinal bacteria contain an enzyme cellulase which metabolises cellulose to SCFA. The total concentration of SCFA in the cecum amounts to 120 mmol/l. Ruminants, like cows, have a large cecum; the resultant luxuriant growth of bacteria digest cellulose to SCFA. Oligofructose is a natural food ingredient derived from partial enzymatic hydrolysis of inulin. This oligosaccharide is not digestible but is fermented by colonic bacteria to produce mainly SCFA.

Fibre Content of Some Foods

Foodstuffs	Total fibre g/100g	Foodstuffs	Foodstuffs	
Cereals	13.5	Vegetables	(A)*	(B)*
Wheat Products		Leafy		
Whole meal flour (100%)		Brussel sprouts	4.2	35.5
		Cabbage	3.4	29.4
Brown flour (70% - 95%)	8.7	Other Vegetables		
		Peas frozen	7.8	37.1
		Runner beans	2.9	26.4
		Onions	1.3	18.1
White flour (70%-72%)	3.5	Root Vegetables		
Wheat bran	30.1	Carrots	2.9	28.4
Oatmeal	7.7	Parsnips	4.9	38.4
Rice, milled	2.7	Turnips	2.2	25.6
Rice, bran	28.5			
Rye, whole meal	12.7			
Legumes and nuts		Fruits		
Groundnut (without skin)	9.3	Apple, flesh	1.4	9.2
Peas, dried	32.5	Banana	1.8	6.8
		Guava	3.6	14.4
		Pears	2.4	14.7
		Peaches	1.5	9.6
		Tomato	1.4	12.2

*A: Cellulose, B: Hemicellulose

Food items permitted in a patient with constipation**Liberally**

- Bread or chapattis of wheat, preferably from granary or wholemeal flour
- Breakfast cereals, preferably high-bran cereals or porridge oats
- Rice, preferably brown rice
- Pasta, preferably wholemeal
- Vegetables, preferably with skin
- Salad & fresh fruits with skin
- 8-10 glasses water per day

Food items to be restricted in amount

- Potatoes, preferably without skin
- Meat, fish or chicken
- Eggs and milk or milk products
- Cooking fat or butter

- Papad, chutney and pickles
- Dry fruits, pastry & desserts and sweets
- Sugar, jaggery, honey and beverages

SAMPLE MENU FOR A PATIENT WITH CONSTIPATION

Western diet

A glass of warm water with /
without honey

High-bran cereal with dried/
Stewed fruit or prunes
Wholemeal bread/toast with butter
Jam/marmalade
Tea or coffee

Tea or coffee
Orange

Cottage pie
Jacket potato with cheese
Fruit salad

Tea or coffee
Crisp bread

Asparagus soup
Peas Chicken
Green beans, baked apple
Carrot cake (wholemeal flour)

Milk drink

Vegetarian diet

On rising

A glass of warm water with/
without lemon or honey

Breakfast

Stewed figs, apricots
Cornflakes
Wholemeal toast or
chapattis made from brown flour
Tea or coffee

Mid-morning

Tea or coffee
Banana

Lunch

Cooked mixed vegetables
Tapioca pudding or vegetable
curry with brown rice

Mid-afternoon

Tea or coffee
Wholemeal crackers

Dinner

Lentil soup
Cooked cabbage and boiled potatoes
Rice and dal or chapattis
made from brown flour

Bed time

Milk drink

MANAGEMENT OF CONSTIPATION

DIET

Calories and proteins : These are advised as per usual requirements. Fats stimulate the flow of bile and also lubricate the bowel. Butter, ghee and cooking oils are beneficial for lean patients. Fried foods should be avoided.

Carbohydrates : Adequate bulk can be supplied, even to an obese patient on a reducing diet, in the form of vegetables and whole fruits, which are rich in unabsorbable cellulose. Bulk can also be provided by unrefined cereals which contain bran. In lean people, bananas and dried fruits like prunes, figs, raisins, dates and apricots provide fibres and are useful adjuncts. Vitamins of the B group, preferably as brewer's yeast, help some patients to regulate the bowel function.

Minerals : Acutely ill or bedridden, semi-starved patients require potassium in the form of vegetable soup, fruit juice or oral potassium salts to prevent constipation.

Fluids : A liberal amount of fluids is advised about 10 glasses or more in hot humid weather. Warm water or tea taken early in the morning on an empty stomach may help to evacuate the bowel. One or two glasses of honey or lemon in warm water at morning for those who do not take tea shall be beneficial for relief of constipation.

Abdominal massage : Talcum powder sprinkled on the hands and abdomen. Firm pressure is applied with the first, beginning over the cecum and continuing along the ascending, transverse and descending colon up to the symphysis pubis. This movement should be repeated 20-30 times early in the morning.

Physical Activities : Regular physical activities such as walking for atleast 20 to 40 minutes a day helps in relieving constipation especially in those having sedentary life style and in elderly.

Reduced calorie intake and increased psychologic distress correlate well; with constipation in the elderly, although the mechanism of the latter remains unknown.

Use of laxatives to be started immediately in those who do not get relief for atleast 4 to 12 weeks of non pharmacological management.

The choice of laxative is determined by:

- The cause of the problem
- Nature of the constipation (is the stool hard or soft, high in the colon or in the rectum?)
- Other medical conditions
- Other medications the patient may be taking
- Cost of treatment
- Patient preference

Treatment of Constipation: Bulking Agents, Stool Softeners and Osmotic and Stimulant Laxatives

Laxative type	Example	Mechanism of action	Onset of effect	Potential adverse effects
Bulk laxative	Nature fibre Psyllium seed husk Semisynthetic fibre Methylcellulose Calcium polycarbophil Synthetic fibre (e.g. polycarbophil)	Increase stool bulk and reduce stool consistency by increasing the retention of water in stool	Psyllium and methylcellulose: 12-72 hours ----- Calcium polycarbophil: 24-48 hours	Gas, bloating, oesophageal obstruction, colonic obstruction, calcium and iron malabsorption
Stool Softeners	Docusate ----- Docusate calcium	Soften stool by enhancing interaction of water with stool	13 days	Stomach, intestinal cramping, irritated throat (liquid formulation)
Osmotic agents	Saline ----- Magnesium hydroxide (e.g. milk of magnesia) ----- Magnesium citrate ----- Magnesium sulphate ----- Sodium phosphate ----- Sodium sulphate ----- Poorly absorbed sugars ----- Lactulose ----- Sorbitol ----- Glycerin suppositories ----- Polyethylene glycol	Retain water in the intestinal lumen by creating an osmotic gradient	Saline: 0.5 - 3 hours ----- Poorly absorbed sugars: 24-48 hours ----- Polyethylene glycol: 24-48 hours	Saline: electrolyte abnormalities (e.g. hypermagnesaemia, hyperphosphataemia, hypokalaemia) can occur. Use with caution inpatients with compromised renal or cardiac function ----- Poorly absorbed sugars: diarrhoea, abdominal cramping, bloating, gas ----- Polyethylene glycol: upset stomach, bloating, cramping, and gas
Stimulant laxatives	Diphenylmethane derivative ----- Bisacodyl ----- Anthraquinone ----- Senna	Increase intestinal peristaltic activity by acting on the nerve plexus of intestinal smooth muscle; cause local mucosal irritation; decrease absorption of water and electrolytes from large intestine	Bisacodyl: 6 - 12 hours ----- Senna: 6 - 12 hours	Electrolyte imbalances (e.g. hypokalaemia), abdominal discomfort and cramping, gas; potential for overuse/abuse. Serum potassium is lower among laxative users vs nonusers and wasting of potassium and water among high-dose laxative abusers is common. Abdominal pain/cramping can be up to 3 times greater than with placebo. These adverse effects can be minimized by appropriate patient selection and dosing.

**Grading of recommendations and Levels of Evidence for
Agents Used to Treat Chronic Constipation (Ram Kumar & Rao)**

Grade	Evidence
A	Good evidence (level 1): Consistent results from well designed, well conducted studies Ex: Polyethylene glycol, Tegaserod
B	Fair evidence (level 2): results show benefit, but strength is limited by the number, quality or consistency of the individual studies (fair quality) Ex: Psyllium, Lactulose
C	Poor evidence (level 3): insufficient because of limited number or power of studies or flaws in design or conduct (poor quality)
	Ex: Magnesium hydroxide, Calcium polycarbophil, Methylcellulose, Senna, Bisacodyl, Docusate, Bran

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Grade	Support	Evidence
A	> 2 level 1 trials without conflicting evidence from other level 1 trials	Level 1: RCTs with $p < 0.05$; adequate sample size; appropriate methods (high quality) Ex: polyethylene glycol, Lactulose, Tegaserod
B	Single level 1 trial or > 2 level 1 trials with conflicting evidence from other level 1 trials or > 2 level 2 trials	Level 2: RCTs with $p < 0.05$; inadequate sample size; or appropriate methods (intermediate quality) Ex: polyethylene glycol, Psyllium, Calcium polycarbophil, Methylcellulose, Bran, Stool softeners, Milk of Magnesia, stimulant laxatives
C	Level 3 - 5 trials	Level 3: non-RCTs with contemporaneous controls Ex: polyethylene glycol, Herbal supplements, Alternative treatments ----- Level 4: non-RCTs with historical controls Ex: Lubricants ----- Level 5: Case series Ex: Combination laxatives

Benefits of Isapgol

In a study, seventy-five patients affected by chronic constipation were treated for 4 weeks with an isapgol preparation. Frequency, stool consistency, abdominal pain and signs of venous stasis improved after treatment. No important side effects were reported in the study. Fiber preparations were evaluated. It was seen that fiber preparations like isapgol increased bowel movement.

Isapgol is the commonest bulk laxative used worldwide, the name used for several members of the plant genus *Plantago* whose seed are used commercially for the production of mucilage. The genus *Plantago* contains over 200 species, Isapgol, commonly used in India is derived from the Persian words "isap" and "ghol", meaning a horse ear describing the shape of the seed. Isapgol, a mucilaginous fibre reduces the gastrointestinal transit time and increase the stool weight. Recent interest in isapgol has arisen primarily due to its cholesterol lowering effects. The exact mechanism of action by which isapgol acts as a hypocholesterolemic agent has not been explained fully, but two major hypotheses have been proposed. Animal studies have shown that isapgol increases the activity of cholesterol 7 alpha-hydroxylase (the rate limiting enzyme in bile acid synthesis also referred to as cytochrome 7A (CYP7A)). In animals fed with a high-fat diet, isapgol increased the activity of cholesterol 7 alphahydroxylase and HMG-CoA reductase. This animal study also demonstrated that both pectin and isapgol reduced Apo B secretion and that LDL catabolic rates were 100 percent faster in animals fed with isapgol.

In human study, isapgol lowered low density lipoproteins (LDL) cholesterol, decreased cholesterol absorption, and increased the fractional turnover of both chenodexychoic and cholic acids. Therefore, in humans isapgol lowered LDL cholesterol primarily via stimulation of bile acid synthesis. Further research might show this action to be through the stimulation of cholesterol 7 alphahydroxylase in humans as well.

Drug Interactions of Bulk Laxatives

- Diuretics, Potassium-sparing or Potassium supplements: Chronic or overuse of this laxative can reduce potassium by promoting potassium loss from the intestines. It may also interfere with the potassium-retaining effects of potassium sparing diuretics.
- Prescription Medications: Bulk Laxative may affect how other medications work. If taking prescription medications, consult with the doctor before using this drug. After taking a prescription medication, wait at least two hours before taking Bulk Laxative.
- Tetracycline antibiotics (oral): Bulk Laxative used concomitantly with tetracyclines may decrease the absorption of the drug because of a possible formation of non-absorbable complexes. After taking tetracyclines, wait at least one or two hours before consuming Bulk Laxative.

Side effects of Bulk Laxatives

- Intestinal obstruction
- Allergic rashes
- Dysphagia (feeling of lump in throat)

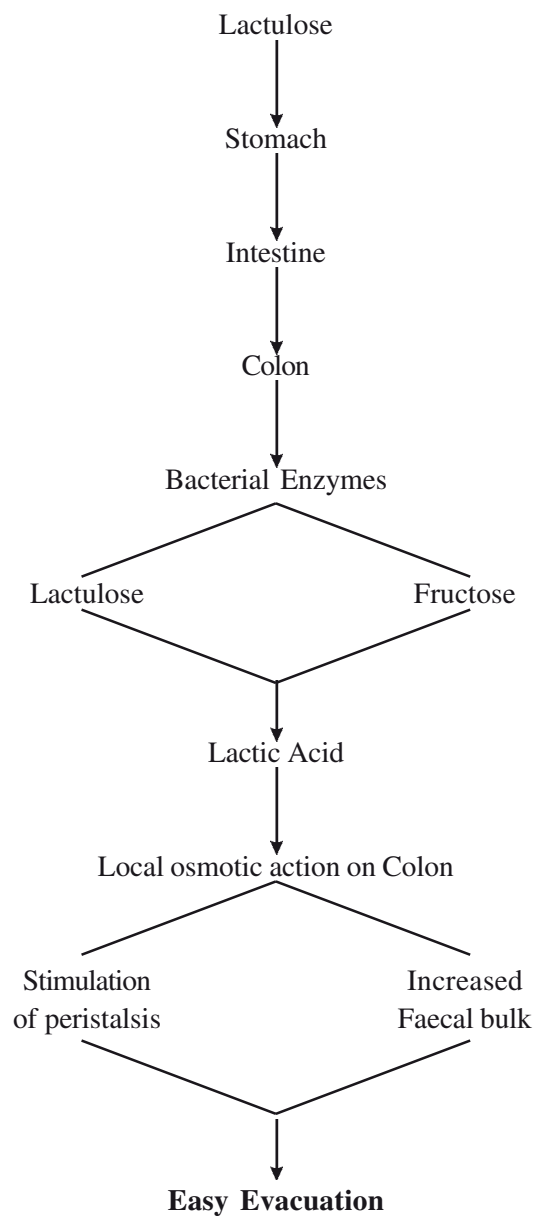
Contraindications of Bulk Laxatives

- Intestinal obstruction
- Suspicion of bowel malignancy
- History of rectal bleed

Lactulose: It is an osmotic agent having the following benefits

- Regulates the bowel gently and reliably
- Ensures easy administration
- Suitable for children, pregnant women and elderly
- Non addictive, no misuse
- No strain on the kidneys
- No destruction of natural intestinal flora

Mechanism of action of Lactulose



Problems with long term Lactulose therapy: Volume overload, Lactulose intolerance, higher incidence of soiling. Diarrhoea and abdominal pain were lower than bulk laxatives.

Tips for management of constipation

- Most cases of constipation can be managed in primary care with attention to likely causative factors and simple targeted interventions
- Red flag symptoms mandate early specialist referral
- If simple interventions fail, consider specialist referral to evaluate possible unusual causes
- New non-surgical and surgical treatments are being developed constantly
- Many patients with debilitating symptoms can be helped greatly with specialist interventions

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