



World Gastroenterology Organisation Global Guideline

Constipation—A Global Perspective

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INTRODUCTION

Constipation is a chronic problem in many patients all over the world. In some groups of patients such as the elderly, constipation is a significant health care problem, but in the majority of cases chronic constipation is an aggravating, but not life threatening or debilitating, complaint that can be managed in primary care with cost-effective control of symptoms.

The terminology associated with constipation is problematic. There are 2 pathophysiologies, which differ in principle but overlap: disorders of transit and evacuation disorders. The first can arise secondary to the second, and the second can sometimes follow from the first.

This guideline focuses on adult patients and does not specifically discuss children or special groups of patients (such as those with spinal cord injury).

Cascades: A Resource-sensitive Approach

A gold standard approach is feasible for regions and countries in which the full range of diagnostic tests and medical treatment options are available for the management of all types and subtypes of constipation.

A cascade is a hierarchical set of diagnostic, therapeutic, and management options for dealing with risk and disease, ranked according to the resources available.

DEFINITION AND PATHOGENESIS

The word “constipation” has several meanings, and the way it is used may differ not only between patients but also between different cultures and regions. In a Swedish population study, it was found that a need to take laxatives

was the most common conception of constipation (57% of respondents). In the same study, women (41%) were twice as likely as men (21%) to regard infrequent bowel motions as representing constipation, whereas equal proportions of men and women regarded hard stools (43%), straining during bowel movements (24%), and pain when passing a motion (23%) as representing constipation. Depending on various factors—the diagnostic definition, demographic factors, and group sampling—constipation surveys show a prevalence of between 1% and >20% in western populations. In studies of the elderly population, up to 20% of community-dwelling individuals and 50% of institutionalized elderly persons reported symptoms.

Functional constipation is generally defined as a disorder characterized by persistent difficult or seemingly incomplete defecation, and/or infrequent bowel movements (once every 3 to 4d or less) in the absence of alarm symptoms or secondary causes. Differences in the medical definition and variations in the reported symptoms make it difficult to provide reliable epidemiologic data.

Pathogenesis and Risk Factors

Functional constipation can have many different causes, ranging from changes in diet, physical activity, or lifestyle to primary motor dysfunctions due to colonic myopathy or neuropathy. Constipation can also be secondary to evacuation disorder. Evacuation disorder may be associated with a paradoxical anal contraction or involuntary anal spasm, which may be an acquired behavioral disorder of defecation in two thirds of patients (Table 1).

Although physical exercise and a high-fiber diet may be protective, the following factors increase the risk of constipation (the association may not be causative):

- Aging (but constipation is not a physiological consequence of normal aging)
- Depression
- Inactivity
- Low calorie intake
- Low income and low education level
- Number of medications being taken (independent adverse effect profiles)
- Physical and sexual abuse
- Female sex—higher incidence of self-reported constipation in women

Associated Conditions and Medications

(Tables 2 and 3)

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TABLE 1. Pathophysiology of Functional Constipation

Pathophysiologic Subtype	Main Feature, With Absence of Alarm Symptoms or Secondary Causes
Slow-transit constipation	Slow colonic transit of stool due to:
Colonic inertia	Decreased colonic activity
Colonic overactivity	Increased uncoordinated colon activity
Evacuation disorder	Colonic transit may be normal or prolonged, but evacuating stools from the rectum is inadequate/difficult
Constipation-predominant irritable bowel syndrome	Abdominal pain, bloating, altered bowel habit May appear in combination with any other subtype

DIAGNOSIS

Constipation is a common condition, and although a minority of patients seek medical care, in the United States alone this accounts for several million physician visits per year, whereas in the United Kingdom more than 13 million general practitioner prescriptions were written for laxatives in 2006. Gastrointestinal specialist help should focus on efficiently applying health care resources by identifying those patients who are likely to benefit from specialized diagnostic evaluation and treatment.

Diagnostic Criteria for Functional Constipation

An international panel of experts developed uniform criteria for the diagnosis of constipation—the Rome III criteria (Table 4).

Patient Evaluation

The medical history and physical examination in constipation patients should focus on identifying possible causative conditions and alarm symptoms.

- *Stool consistency*: This is regarded as a better indicator of colon transit than stool frequency (Fig. 1).
- Patient's description of constipation symptoms, symptom diary
 - Bloating, pain, malaise
 - Nature of stools
 - Bowel movements
 - Prolonged/excessive straining
 - Unsatisfactory defecation
- Laxative use, past and present, frequency and dosage
- Current conditions, medical history, recent surgery, psychiatric illness
- Patient's lifestyle, dietary fiber, and fluid intake
- Use of suppositories or enemas, other medications (prescription or over-the-counter)
- Physical examination:
 - Gastrointestinal mass
 - Anorectal inspection:
 - Fecal impaction
 - Stricture, rectal prolapse, rectocele
 - Paradoxical or nonrelaxing puborectalis activity
 - Rectal mass

If indicated: blood tests—biochemical profile, complete blood count, calcium, glucose, and thyroid function

Alarm Symptoms (Table 5)

Indications for Screening Tests

Laboratory studies, imaging or endoscopy, and function tests are only indicated in patients with severe chronic constipation or alarm symptoms (Table 6).

Transit Measurement

The 5-day marker retention study is a simple method for measuring colonic transit. Markers are ingested on one

TABLE 2. Possible Causes and Constipation-associated Conditions

Mechanical obstruction
Colorectal tumor
Diverticulosis
Strictures
External compression from tumor/other
Large rectocele
Megacolon
Postsurgical abnormalities
Anal fissure
Neurological disorders/neuropathy
Autonomic neuropathy
Cerebrovascular disease
Cognitive impairment/dementia
Depression
Multiple sclerosis
Parkinson disease
Spinal cord pathology
Endocrine/metabolic conditions
Chronic kidney disease
Dehydration
Diabetes mellitus
Heavy metal poisoning
Hypercalcemia
Hypermagnesemia
Hyperparathyroidism
Hypokalemia
Hypomagnesemia
Hypothyroidism
Multiple endocrine neoplasia II
Porphyria
Uremia
Gastrointestinal disorders and local painful conditions
Irritable bowel syndrome
Abscess
Anal fissure
Fistula
Hemorrhoids
Levator ani syndrome
Megacolon
Proctalgia fugax
Rectal prolapse
Rectocele
Volvulus
Myopathy
Amyloidosis
Dermatomyositis
Scleroderma
Systemic sclerosis
Dietary
Dieting
Fluid depletion
Low fiber
Anorexia, dementia, depression
Miscellaneous
Cardiac disease
Degenerative joint disease
Immobility

TABLE 3. Medications Associated With Constipation

Prescription drugs Antidepressants Antiepileptics Antihistamines Antiparkinson drugs Antipsychotics Antispasmodics Calcium channel blockers Diuretics Monoamine oxidase inhibitors Opiates Sympathomimetics Tricyclic antidepressants Self-medication, over-the-counter drugs Antacids (containing aluminium, calcium) Antidiarrheal agents Calcium and iron supplements Nonsteroidal anti-inflammatory drugs
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TABLE 4. Rome III Criteria for Functional Constipation

General criteria Presence for at least 3 mo during a period of 6 m Specific criteria apply to at least 1 out of every 4 defecations Insufficient criteria for irritable bowel syndrome No, or rarely, loose stools Specific criteria: 2 or more present Straining Lumpy or hard stools Feeling of incomplete evacuation Sensation of anorectal blockage or obstruction Manual or digital maneuvers applied to facilitate defecation Fewer than 3 defecations per week
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TABLE 5. Alarm Symptoms in Constipation

Alarm symptoms or situation Change in stool caliber Heme-positive stool Iron-deficiency anemia Obstructive symptoms Patients > 50 y of age with no previous colon cancer screening Recent onset of constipation Rectal bleeding Rectal prolapse Weight loss Recommended test: colonoscopy

TABLE 6. Physiologic Tests for Chronic Constipation

Test	Strength	Weakness	Comment
Colonic transit study with radiopaque markers	Evaluates the presence of slow, normal, or rapid colonic transit; inexpensive and widely available	Inconsistent methodology; validity has been questioned	Useful for classifying patients according to pathophysiologic subtypes
Anorectal manometry	Identifies evacuation disorder, rectal hyposensitivity, rectal hypersensitivity, impaired compliance, Hirschsprung disease	Lack of standardization	Useful for establishing diagnoses of Hirschsprung disease, evacuation disorder, and rectal hyposensitivity or hypersensitivity
Balloon expulsion test	Simple, inexpensive, bedside assessment of the ability to expel a simulated stool; identifies evacuation disorder	Lack of standardization	Normal balloon expulsion test does not exclude dyssynergia; should be interpreted alongside results of other anorectal tests

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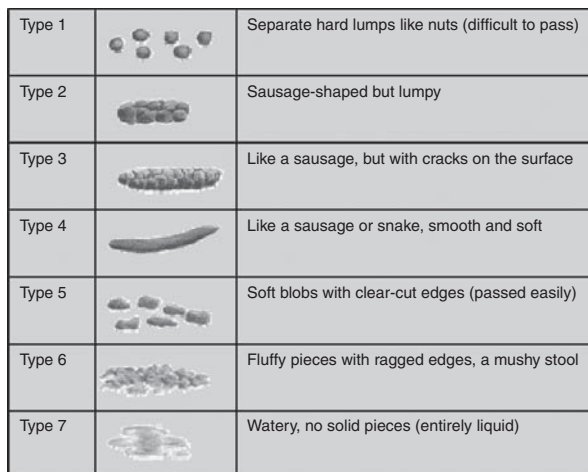


FIGURE 1. The Bristol Stool Form Scale: A measure to assist patients in reporting on stool consistency. Reproduced from http://commons.wikimedia.org/wiki/File:Bristol_Stool_Chart.png. © 1997 Informa Healthcare.

occasion and the remaining markers are counted on a plain abdominal radiograph 120 hours later. If >20% of the markers remain in the colon, transit is delayed. Distal accumulation of markers may indicate an evacuation disorder, and in typical cases of slow-transit constipation almost all markers remain and markers are seen in both the right and the left colon.

Several companies produce markers, but markers can also be made from a patient-safe radiopaque tube by cutting it into small pieces (2 to 3 mm in length). A suitable number of markers (20 to 24) can be placed in gelatin capsules to facilitate ingestion.

Clinical Evaluation

Classification of the patient’s constipation should be possible on the basis of the medical history and appropriate examination and testing (Table 7).

Cascade Options for Investigating Severe and Treatment-refractory Constipation

Cascade: a hierarchical set of diagnostic, therapeutic, and management options for dealing with risk and disease, ranked according to the resources available.

TABLE 7. Constipation Categories Based on Clinical Evaluation

Constipation Type	Typical Findings
Normal-transit constipation, constipation-predominant irritable bowel syndrome	Patient history, no pathology at physical inspection/examination Pain and bloating Feeling of incomplete evacuation
Slow-transit constipation	Slow colonic transit Normal pelvic floor function
Evacuation disorder	Prolonged/excessive straining Difficult defecation even with soft stools Patient applies perineal/vaginal pressure to defecate Manual maneuvers to aid defecation High basal sphincter pressure (anorectal manometry)
Idiopathic/organic/secondary constipation	Known drug side effects, contributing medication Proven mechanical obstruction Metabolic disorders—abnormal blood tests

Level 1: Limited resources

- Medical history and general physical examination
- Anorectal examination, 1-week bowel habit diary card
- Transit study using radiopaque markers
- Balloon expulsion test

Level 2: Medium resources

- Medical history and general physical examination
- Anorectal examination, 1-week bowel habit diary card
- Transit study using radiopaque markers

- Balloon expulsion test or defecography

Level 3: Extensive resources

- Medical history and general physical examination
- Anorectal examination, 1-week bowel habit diary card
- Transit study using radiopaque markers
- Defecography or magnetic resonance proctography
- Anorectal manometry
- Sphincter electromyography

TREATMENT**Scheme for General Management of Constipation (Table 8)****Symptomatic Approach**

If organic and secondary constipation have been evaluated and excluded, most cases can be managed adequately with a symptomatic approach.

- A graded approach to treatment is based on recommending changes in lifestyle and diet, stopping or reducing medications that cause constipation, and administering fiber supplementation or other bulk-forming agents. A gradual increase in fiber (either as standardized supplements or incorporated in the diet) and fluid intake is generally recommended.
- The second step in the graded approach is to add osmotic laxatives. The best evidence is for the use of polyethylene glycol, but there is also good evidence for lactulose. The new drugs, lubiprostone and linaclotide, act by stimulating ileal secretion and thus increasing fecal water. Prucalopride is also approved in many countries and in Europe.
- The third step includes stimulant laxatives, enemas, and prokinetic drugs. Stimulant laxatives can be given orally or

TABLE 8. General Management of Constipation

1. Patient history + physical examination	
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2. Classify the patient's type of constipation—see Table 7 (constipation categories)	
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3. Medical approach in uncomplicated normal-transit constipation without alarm symptoms	Fiber, milk of magnesia Add lactulose/PEG Add bisacodyl/sodium picosulfate Adjust medication as needed
↓	
4. In treatment-resistant constipation, specialized investigations can often identify a cause and guide treatment	Standard blood test and colonic anatomic evaluation to rule out organic causes; manage the underlying pathology causing constipation The majority of patients will have a normal/negative clinical evaluation and may meet the criteria for constipation-predominant IBS. These patients will probably benefit from treatment with fiber and/or osmotic laxatives
↓	
5. If treatment fails, continue with specialized testing (this may only apply to the "extensive resources" level)	Identify STC with a radiopaque marker study Exclude evacuation disorder with anorectal manometry and balloon expulsion test Evaluate anatomic defects with defecography
↓	
6. Treatment of STC with aggressive laxative programs	Fiber, milk of magnesia, bisacodyl/sodium picosulfate Prucalopride, lubiprostone Add lactulose/PEG if no improvement In refractory constipation, a few highly selected patients may benefit from surgery

IBS indicates irritable bowel syndrome; PEG, polyethylene glycol; STC, slow-transit constipation.

TABLE 9. Summary: Evidence Base for the Treatment of Constipation*

Treatment Modalities Commonly Used for Constipation	Recommendation Level and Grade of Evidence
Bulking agents	
Psyllium	Level II, grade B
Calcium polycarbophil	Level III, grade C
Bran	Level III, grade C
Methylcellulose	Level III, grade C
Osmotic laxatives	
Polyethylene glycol	Level I, grade A
Lactulose	Level II, grade B
Wetting agents	
Dioctyl sulfosuccinate	Level III, grade C
Stimulant laxatives	
Bisacodyl/sodium picosulfate	Level II, grade B*
Senna	Level III, grade C
Others	
Prucalopride	Level I, grade A*
Lubiprostone	Level I, grade A*
Biofeedback therapy for evacuation disorder	Level I, grade A
Linaclotide	Level II, grade B*
Surgery for severe colonic inertia	Level II, grade B

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Adapted by the present constipation guideline review team.

rectally to stimulate colorectal motor activity. Prokinetic drugs are also meant to increase the propulsive activity of the colon, but in contrast to stimulant laxatives, which should only be taken occasionally; they are designed to be taken daily.

Diet and Supplements

- Dietary modification may consist of a high-fiber diet (25 g of fiber) and fluid supplementation (up to 1.5 to 2.0 L/d) and may improve stool frequency and decrease the need for laxatives.
- There is no evidence that dietary and lifestyle measures have any effect on constipation in the elderly persons; fiber supplements and simple osmotic laxatives are usually an adequate approach for constipation in these patients.
- In patients with colonic dilation, fiber supplementation should be avoided.
- Psyllium supplements and lactulose may be appropriate for the treatment of chronic constipation.

Medication

- Evacuation disorders respond poorly to standard oral laxative programs. If an evacuation disorder plays a considerable role in constipation, biofeedback and pelvic muscle training may be considered. Critical success factors are the patient's level of motivation, the frequency of the training program, and participation of a behavioral psychologist and dietitian.
- If a dietary approach fails, polyethylene glycol (17 g polyethylene glycol laxative for 14d) or lubiprostone (24mg twice daily) can be used to promote bowel function in patients with chronic constipation.
- Prokinetic agents (eg, the 5-HT₄ receptor agonist prucalopride) can be used in constipation-predominant irritable bowel syndrome.
- Simple laxative agents, such as milk of magnesia, senna, bisacodyl, and stool softeners are a reasonable choice for treating constipation.

Surgery

- If there is persistent treatment failure in slow-transit constipation, then carefully selected, well-evaluated, and informed patients may benefit from total colectomy with ileorectal anastomosis. The exceptional indication for colectomy must be established in a specialized and experienced tertiary center. Disappointing results may be seen, with fecal incontinence due to surgery and recurrent constipation, especially in patients with evacuation disorder.
- Only very few patients benefit from a (reversible) colostomy to treat constipation.

Evidence-based Summary (Table 9)

Cascade Options for Treatment of Chronic Constipation

The following cascade is intended for patients with chronic constipation without alarm symptoms and with little or no suspicion of an evacuation disorder. The main symptoms would be hard stools and/or infrequent bowel movements.

Level 1: Limited resources

- Dietary advice (fiber and fluid)
- Fiber supplementation
- Milk of magnesia (magnesium hydroxide in an aqueous solution)
- Stimulant laxatives (bisacodyl better than senna) for temporary use

Level 2: Medium resources

- Dietary advice (fiber and fluid)
- Fiber supplementation, psyllium
- Milk of magnesia, lactulose, macrogol
- Stimulant laxatives for temporary use

Level 3: Extensive resources

- Dietary advice (fiber and fluid)
- Psyllium or lactulose
- Macrogol or lubiprostone
- Prokinetics (prucalopride)
- Stimulant laxatives (bisacodyl or sodium picosulfate)

Cascade Options for Treatment of Evacuation Disorders

This cascade is for patients with chronic constipation without alarm symptoms, but with suspicion of an evacuation disorder. The main symptoms would be prolonged straining, a feeling of incomplete evacuation, thin stools, a feeling of blockage, or failure of treatment for constipation with hard stools.

Level 1: Limited resources

- Dietary and behavioral advice (fiber, fluid, timed bowel training)
- Therapy for chronic constipation

Level 2: Medium resources

- Dietary and behavioral advice (fiber, fluid, timed bowel training)
- Therapy for chronic constipation
- Biofeedback therapy

Level 3: Extensive resources

- Dietary and behavioral advice (fiber, fluid, timed bowel training)
- Therapy for chronic constipation
- Biofeedback therapy
- Surgical evaluation