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Constipation: An Integrated Review of Pathophysiology, Etiology, Diagnosis and Evidence-Based Management

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Abstract
Constipation is a common gastrointestinal symptom complex characterized by difficult, infrequent or incomplete evacuation and hard stool consistency. Bowel frequency varies among healthy individuals; therefore, assessment should consider stool form, straining, blockage and incomplete evacuation rather than frequency alone. This review summarizes normal defecation physiology, major mechanisms and causes of constipation, clinical features, diagnostic assessment, complications and management from a B.Pharm perspective. Lifestyle and dietary measures are foundational, while laxatives and other medicines may be appropriate when symptoms persist. Medication review, patient education and recognition of warning signs are important components of safe care.

Keywords: constipation; laxatives; functional constipation; chronic idiopathic constipation; pharmacotherapy; pelvic floor; patient education.

I. Introduction and Definition

Constipation is a common bowel disorder in which stool becomes difficult to pass, infrequent, hard or incompletely evacuated. Common features include excessive straining, lumpy or dry stools, a feeling of anorectal blockage and the sensation that the bowel has not emptied fully. Fewer than three bowel movements per week may support the assessment, but this finding alone does not establish the diagnosis. Constipation may be short-lived or chronic and can affect comfort, daily activities and quality of life.

II. Epidemiology and Significance

Reported prevalence varies with population, study methods and diagnostic criteria; the source article estimates that constipation affects approximately 10–20% of the general population. It is reported more often in women and becomes more common with advancing age. Children, older adults, people with limited mobility and those taking constipating medicines are also affected. Because people may self-manage symptoms without seeking care, prevalence may be underestimated. A structured assessment helps distinguish uncomplicated constipation from symptoms that need further medical evaluation.

III. Normal Physiology of Defecation

The colon absorbs water and electrolytes and forms stool. Coordinated colonic contractions move fecal material toward the rectum. Rectal filling activates stretch receptors and initiates the defecation reflex, including involuntary relaxation of the internal anal sphincter. When defecation is appropriate, the external anal sphincter and puborectalis muscle relax, the anorectal angle becomes less acute, and abdominal pressure helps expel stool. Normal evacuation therefore depends on adequate stool formation, colonic motility, rectal sensation, intact neural pathways and coordinated pelvic-floor and sphincter function.

Key sequence: colonic movement → rectal filling and sensation → sphincter/pelvic-floor relaxation → coordinated expulsion.

IV. Pathophysiology

Constipation develops when colonic transit, stool water content, rectal sensation or the mechanics of evacuation are disturbed. Several mechanisms may act together:

Delayed transit and abnormal motility
Reduced frequency or strength of propulsive colonic contractions slows movement of stool toward the rectum. Longer transit time permits additional water absorption, producing hard and dry stool.

Impaired rectal sensation and defecatory dysfunction
Some individuals experience a reduced urge to defecate despite rectal filling. Others have impaired coordination of the abdominal muscles, rectum,

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pelvic floor and anal sphincter. Failure of the pelvic floor to relax, or inappropriate contraction during attempted evacuation, can obstruct stool passage.

Stool retention and gut–brain factors
Repeatedly postponing defecation may allow stool to remain longer in the colon, become harder and be more painful to pass. This can encourage further withholding and perpetuate symptoms. Interactions among the enteric and autonomic nervous systems, central nervous system and intestinal microbiota may also influence motility and sensation; microbiota changes remain an area of investigation.

Pathophysiological sequence: slow transit or impaired evacuation → prolonged retention → increased water absorption →hard stool → difficult passage → further retention.

V. Causes and Risk Factors

Constipation is multifactorial. Important contributors include:

- **Dietary:** low fibre intake, inadequate fluids, low intake of fruits, vegetables and whole grains, and frequent low-fibre processed foods.
- **Behavioural/lifestyle:** physical inactivity, prolonged sitting, irregular toileting, ignoring the urge to defecate, travel or routine changes, and stress.
- **Medication-related:** opioid analgesics, iron preparations, aluminium- or calcium-containing antacids, anticholinergics, some antidepressants, anticonvulsants, calcium-channel blockers and certain diuretics.
- **Metabolic/endocrine:** hypothyroidism, diabetes, hypercalcemia, electrolyte disturbances and chronic kidney disease.
- **Neurological:** Parkinson's disease, multiple sclerosis, spinal cord disorders and autonomic neuropathy.
- **Structural/anorectal:** intestinal obstruction, colorectal tumours, anal stricture, rectal prolapse and painful anorectal conditions.
- **Functional/pelvic floor:** normal-transit constipation, slow-transit constipation and defecatory disorders.

Classification
Constipation may be classified as primary (functional) or secondary. Functional constipation has no clearly identified structural or biochemical cause and may involve normal transit, slow transit or a defecatory disorder. Secondary constipation is associated with medicines, systemic disease, neurological conditions or structural abnormalities. Correct classification supports more targeted treatment.

Signs and Symptoms
Common symptoms include infrequent bowel movements, hard or lumpy stool, straining, difficulty passing stool, incomplete evacuation, a sensation of blockage, abdominal pain or cramps, bloating, reduced urge to defecate and painful bowel movements. Flatulence, nausea, appetite changes and rectal discomfort may also occur. Symptom severity and combination vary between individuals.

Diagnosis
Diagnosis is usually based on symptom history and physical examination. Assessment should include bowel frequency, stool consistency, symptom duration, straining, incomplete evacuation, blockage, abdominal or rectal discomfort, diet and fluid intake, activity, toileting habits, current medicines, previous episodes and relevant medical or surgical history.

Rome IV features
Functional constipation is assessed using symptom criteria. At least two features may be present: straining during more than 25% of defecations; hard or lumpy stool in more than 25%; incomplete evacuation in more than 25%; a sensation of anorectal obstruction in more than 25%; manual manoeuvres to facilitate evacuation in more than 25%; or fewer than three spontaneous bowel movements per week. Symptoms must fit the required duration and not be better explained by another disorder.

Examination and investigations
Examination may include abdominal assessment for distension, tenderness, masses or fecal loading; perianal inspection for fissures, haemorrhoids or abnormalities; and, when appropriate, digital rectal examination to assess stool, anal tone, pelvic-floor coordination and structural findings. Laboratory testing is not necessary for everyone but may be selected when indicated—for example, complete blood count, electrolytes, calcium, thyroid-stimulating hormone or blood glucose. Further testing may be required for persistent, severe or atypical symptoms.

Differential Diagnosis and Warning Signs
The assessment should consider medication effects, endocrine or metabolic disorders, neurological

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disease, irritable bowel syndrome with constipation, pelvic-floor dysfunction and structural disease. Persistent or unexplained symptoms should not automatically be assumed to be simple functional constipation. Rectal bleeding, unexplained weight loss, vomiting, severe abdominal pain or distension, anaemia, or a significant change in bowel habits warrants timely medical evaluation.

Complications

Persistent or severe constipation may contribute to haemorrhoids, anal fissures, rectal bleeding, abdominal pain and distension. Prolonged stool retention can cause fecal impaction; softer stool may leak around an impaction and produce overflow incontinence. Chronic straining may contribute to rectal prolapse. Constipation can also cause distress and reduce quality of life. Rare but serious complications in severe cases include intestinal obstruction, stercoral ulceration and bowel perforation.

Clinical principle: warning signs, suspected impaction or possible obstruction require professional assessment rather than continued unsupervised self-treatment.

Management: Overall Approach

Treatment aims to achieve comfortable bowel movements, soften hard stool, reduce straining and bloating, prevent complications, address the underlying cause and improve quality of life. The approach depends on symptom severity, duration, constipation type, age, medical conditions and medicines being taken.

Assessment and identify cause → lifestyle and dietary measures → suitable medicine if needed → reassessment → specialized evaluation for persistent or refractory symptoms.

Non-Pharmacological and Dietary Management

Dietary fibre

Fibre increases stool bulk and may improve regularity. Sources include whole grains, oats, brown rice, whole-wheat products, fruits, vegetables, pulses, beans, nuts and seeds. Fibre should be increased gradually to reduce gas and bloating. Whole fruits generally provide more fibre than fruit juice.

Fluids and daily routine

Adequate fluid intake supports stool consistency, particularly when fibre intake increases. Individual fluid needs vary with age, activity, climate and medical conditions. A regular toileting routine, responding to the natural urge rather than repeatedly delaying defecation, and allowing relaxed time in the toilet may support bowel habits.

Physical activity, posture and wellbeing

Regular age- and ability-appropriate activity, such as walking or cycling, may support bowel regularity. A small foot support to raise the knees can help some people adopt a more favourable defecation posture. Adequate sleep, stress management and a consistent daily schedule may also help.

Practical sequence: fibre-rich balanced diet + adequate fluids + activity + regular toileting → improved stool bulk and consistency → easier passage.

Pharmacological Treatment

Medicines may be considered when lifestyle measures are insufficient. Selection should be individualized and take account of other medicines, age, renal function, pregnancy status and underlying disease. Examples of major categories in the source article are summarized below.

Bulk-forming laxatives

Psyllium (ispaghula husk), methylcellulose and calcium polycarbophil retain water and increase stool bulk. Bloating or flatulence may occur, particularly when fibre is increased rapidly.

Osmotic laxatives

Polyethylene glycol (PEG), lactulose, magnesium hydroxide and magnesium oxide increase water in the intestinal lumen and soften stool. Possible adverse effects include bloating, cramps or diarrhoea. Magnesium-containing products require caution in people with significant kidney impairment.

Stool softeners and stimulant laxatives

Docusate is a stool-softening agent used in selected situations. Bisacodyl and senna stimulate bowel activity and may be used for short-term or rescue treatment. Cramping and diarrhoea can occur with stimulant laxatives.

Secretagogues and prokinetic agents

Lubiprostone, linaclotide and plecanatide increase intestinal fluid secretion in selected patients with chronic constipation. Prucalopride is a prokinetic agent that may be considered for selected patients who have not responded adequately to conventional treatment.

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Rectal preparations
Glycerin or bisacodyl suppositories and enemas may be used in selected circumstances when stool is present in the rectum. Persistent or unexplained symptoms still require assessment.
Medicines should be used according to professional advice and product instructions. Avoid prolonged self-medication without review, especially if symptoms are worsening or warning signs occur.

Secondary, Specialized and Refractory Constipation
When constipation is related to a medical condition or medicine, management should address the cause where possible. A healthcare professional may review contributing medicines, treat metabolic or endocrine disorders, assess neurological or pelvicfloor conditions, investigate suspected structural abnormalities and manage fecal impaction when present.
Patients with pelvic-floor dysfunction may benefit from pelvic-floor rehabilitation or biofeedback, which aims to improve coordination between the abdominal muscles, rectum, pelvic floor and anal sphincter. When conventional measures fail, additional assessment of colonic transit or anorectal function may help identify the mechanism and guide individualized treatment.

Special Populations
Children and adolescents
Constipation may be associated with dietary changes, toilet-training difficulties, stool withholding and painful defecation. Management emphasizes suitable dietary and behavioural measures, regular toileting and medical evaluation when symptoms persist. Medicines should be selected according to age with healthcare supervision. **Older adults and people with limited mobility**
Reduced activity, changes in diet and hydration, chronic diseases and multiple medicines can increase risk. Management may include individualized activity, appropriate fibre and fluids, a toileting routine and review of medicines. New or persistent symptoms in older adults need clinical assessment.
Pregnancy
Hormonal changes, reduced motility, activity changes and iron-containing supplements may contribute. Lifestyle measures are generally considered first when appropriate. Any medicine during pregnancy should be selected with healthcare guidance. **Chronic disease, neurological conditions and constipating medicines**
Diabetes, hypothyroidism, neurological disorders and medicines such as opioids, anticholinergics, some antidepressants, iron and calcium-containing products may contribute. A medication review and assessment of the underlying condition are important. Medicines should not be stopped or changed without professional advice.

Prevention and Patient Education
Preventive counselling should reinforce a balanced fibre-rich diet, adequate fluids suited to the individual, regular physical activity, a consistent toileting routine and responding to the urge to defecate. Patients should understand that bowel habits vary and that frequency alone does not define constipation. Fibre is best increased gradually. Laxatives should be selected carefully, and persistent symptoms should prompt review.
Pharmacists can help identify medication-related constipation, explain correct use of non-prescription products, discuss potential adverse effects and interactions, encourage appropriate lifestyle measures and refer patients with warning signs or symptoms that do not improve.

Recent Directions
The source article highlights continuing interest in gastrointestinal motility, gut–brain interactions, intestinal microbiota, pelvic-floor dysfunction, improved diagnostic methods and targeted medicines. These areas may support more individualized assessment and treatment, although the appropriate approach depends on the patient's clinical findings.

VI. Conclusion

Constipation is a common, multifactorial gastrointestinal disorder that can affect comfort and quality of life. Its mechanisms may include delayed colonic transit, altered stool water content, impaired rectal sensation and defecatory dysfunction. Effective care combines assessment of symptoms and causes with dietary and lifestyle measures, appropriate medicines when needed, and targeted treatment for secondary or refractory cases. Patient education, rational medicine use and timely recognition of warning signs are essential for safe long-term management.

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