



Constipation is a common complaint, especially in older adults. It results in millions of physician visits per year, with hundreds of millions of dollars spent on laxatives.

Untreated it can lead to serious morbidity and can be a contributing factor in mortality. A rational approach to the patient presenting with constipation includes a detailed history, general and focused physical examination, specific investigations, and appropriate therapy. Treatment should aim to address the underlying cause, as should the choice of laxative. In general, it is best to clear out hard stool in the distal bowel before using an aggressive oral regimen.

**Key words:** constipation, laxatives, older adults, opioids

## A Rational Approach to Constipation

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### Introduction

Constipation is a very common finding, particularly in older adults. The prevalence in North America in individuals over 18 years of age has been estimated to be as high as 27%,<sup>1</sup> with up to 26% of men and 34% of women over the age of 65 reporting symptoms.<sup>2</sup> In the United States alone, over two and a half million physician visits per year are devoted to constipation<sup>1</sup> with more than \$800 million spent on laxatives annually.<sup>3</sup>

Constipation is not a benign condition. Case reports of deaths due to bowel perforation attributed to constipation have been published.<sup>4</sup> Other complications including hemorrhoids, anal fissures, rectal prolapse, fecal impaction, perforation, and overflow diarrhea have also been reported.<sup>5</sup> In long-term and acute care health centres, constipation is often overlooked or treated less aggressively than it should be, contributing to morbidity and mortality.<sup>4</sup>

Among older adults, many factors can contribute to the problem. Inappropriate use of medications increases the risk of constipation. Multiple medical problems may contribute to it as well. Social isolation and impaired cognitive ability may result in behaviours, such as poor adherence with medications or poor diet, that exacerbate the situation.<sup>6</sup>

This article describes criteria for diagnosis and a rational approach to assess the patient complaining of consti-

pation and guides the clinician to initiate appropriate therapies based on the underlying cause and the mechanism of actions of various laxatives.

### Definition of Constipation

In 1992 the Rome Criteria were established to define constipation and then updated in 1999 as Rome II (Table 1). Patients must have at least two of the criteria for a period of twelve weeks with a minimum frequency of normal stools at three per week. A number of additional symptoms in as few as 25% of bowel movements may confirm the diagnosis.<sup>7</sup>

There are many subjective perceptions of constipation, usually involving changes in stool frequency and texture. However, many do not fit the formal definition of constipation. Any patient with a worrisome change in bowel habits should be investigated and those found to have benign causes may benefit from similar treatment.

### Causes of Constipation

In most patients with chronic constipation, the cause is usually multifactorial. For proper assessment, it is useful to sort the major causes into categories (Table 2).

### Dietary

Inadequate fibre intake is a common reason for constipation in Western society.<sup>9</sup> The average North American diet, with its emphasis on fast food and

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white flour, often includes 5–10 g of fibre per day, much lower than the recommended 20–35 g.<sup>9</sup> For older adults, cognitive and physical impairment may hinder the procurement of a proper diet and increase the risk of constipation. They may choose foods that are easier to prepare or to chew and swallow or consume less in situations where they eat alone. The “tea and toast” diet is well known to those who care for older adults.<sup>10</sup> Some foods, Montreal-style bagels, for example tend to be particularly hard on the bowels.

### Drugs

Although many medications can cause constipation, the most commonly recognized drugs implicated in constipation are those that affect the central nervous system, nerve conduction or smooth muscle function,<sup>9</sup> such as opiates. However, the effects vary between patients. Some will have almost no difficulties and require minimal laxative support while others have a very hard time. Opioids inhibit gastric emptying and propulsive motor activity of the intestine by suppressing neuronal excitability.<sup>11</sup> Due to the slower passage of luminal contents, opioids also change bowel fluid handling by increasing the time available for fluid absorption.<sup>12</sup> While tolerance to other side effects and dose develops over time, tolerance to the effects of opioids on constipation does not.<sup>9</sup>

Drugs with anticholinergic effects may cause constipation. Many medications (including antiemetic drugs, cold preparations, and psychotropic medications) have anticholinergic activity. Considering that these products may cause unwanted cognitive side effects, especially in older adults, they should be prescribed with caution.<sup>9</sup>

Other drugs that can impair bowel function include cation supplements (iron, calcium, antacids) with the exception of magnesium. Nondihydropyridine calcium channel blockers (verapamil, diltiazem) can also cause constipation. Diuretics may lead to dehydration, causing constipation.

### Metabolic

A number of metabolic disorders are associated with constipation. This symptom is very common in patients with hypothyroidism.<sup>12</sup> Several electrolyte disturbances can be implicated, hyper- and hypocalcaemia and hypokalemia, which can lead to ileus or slowed bowel function.<sup>3</sup> Less common conditions such as panhypopituitarism and porphyria may have constipation as a presenting symptom as well.<sup>13</sup>

### Neurological

Neurological causes of constipation are often overlooked. Some are obvious, such as spinal cord injury (compression, transection),<sup>8</sup> but others may be less so, such as autonomic neuropathy. Patients with Parkinson’s disease may run into difficulty either because of their disease or the medications used to treat it.<sup>9</sup> There have been reports of neurogenic constipation associated with multiple sclerosis,<sup>9</sup> and diabetic-related neuropathy may cause both extremes in bowel function.<sup>3</sup> Patients may become constipated after a stroke.<sup>5</sup>

### Other Causes of Constipation

A number of miscellaneous causes of constipation exist. While it is beyond the scope of this review to list all of them, a few are common enough to mention.

Rectal and sigmoid tumours can cause a change in bowel function that leads to constipation, as can adhesions from prior surgeries, and colorectal strictures.<sup>3</sup> Cancer patients with advanced disease may find their bowels sluggish because of decreased mobility and fluid intake.<sup>14</sup> Similarly, pelvic floor dysfunction can create difficulties in the synchronous muscular activity that is required to push stool boluses effectively.<sup>3</sup> More benign causes can include decreased fluid intake and pregnancy, especially in the third trimester where progesterone levels are highest which slows gastrointestinal motility.<sup>8</sup>

There is some thought that a sedentary lifestyle may contribute to increased colonic transit time, which can result in harder, less frequent stools.<sup>11</sup> This may be

**Table 1:** ROME II Criteria for Chronic Constipation

#### DIAGNOSTIC CRITERIA

At least 12 weeks, which need not be consecutive, in the preceding 12 months of two or more of:

- (1) Straining in >1/4 defecations
- (2) Lumpy or hard stools in >1/4 defecations
- (3) Sensation of incomplete evacuation in >1/4 defecations
- (4) Sensation of anorectal obstruction/blockade in >1/4 defecations
- (5) Manual maneuvers to facilitate >1/4 defecations (e.g., digital evacuation, support of the pelvic floor)
- (6) <3 defecations/week.

Loose stools are not present, and there are insufficient criteria for IBS.

Source: Thompson WG, et al., 1999.<sup>7</sup>

an important factor for older adults. Cognitive decline may lead to lack of motivation or forgetting to exercise. Physical impairment (weakness, balance problems) may make it difficult or impossible to exercise sufficiently.

### Assessment

Assessment of the patient with constipation includes a thorough history and physical examination, followed by appropriate laboratory and radiological investigations. The tests performed are directed by the clinical findings and should be used to confirm the diagnosis as well as assess the severity of the problem.

### History

Using the Rome Criteria as a guide, patients should be questioned on their baseline bowel function and subsequent changes. Frequency of bowel movements, changes in consistency, straining, and a feeling of incomplete evacuation should be elicited.<sup>3</sup> Patients should be asked about bloating, abdominal discomfort, and nausea.

Careful attention should be paid to clues that suggest chronic illnesses, such as diabetes, renal failure or hypothyroidism, as these often contribute to constipation in a number of ways.<sup>3</sup> Loss of appetite is an important symptom. A careful medication history (including nonprescription drugs and nutritional supplements) is essential.

For older adults presenting with caregivers, it is important that the caregiver be a part of the assessment process. Especially when the patient has an element of cognitive impairment, the caregiver can provide helpful details that may otherwise be left out.

### Physical Examination

The physical examination pertinent to constipation has two parts. On abdominal exam, the clinician should look for signs of distension. Palpation, especially in thin patients, may reveal hard, palpable stool in the ascending, descending, and sigmoid segments of the colon. Rectal examination should be performed, assessing rectal tone to rule out neurological compromise, to feel for the presence of hard or impacted stool, and to test for fecal occult blood, which may suggest the presence of a neoplastic cause.<sup>3</sup> The presence or absence of internal or external hemorrhoids should be noted.

The examination also includes a more general survey for signs of chronic disease. A description of all physical findings that may contribute to constipation is beyond the scope of this review; however, special attention should be paid to signs suggestive of metabolic or neoplastic abnormalities.

### Investigations

Laboratory investigations should be directed by the history and physical examination. Generally, routine blood work includes a complete blood count (looking for anemia to suggest GI neoplasm or chronic disease), serum potassium, and calcium (ionized or total + albumin). If clinical suspicion arises, metabolic screens (TSH, HbA1c) may be ordered.<sup>3</sup>

In cases of suspected severe consti-

**Table 2:** Primary and Secondary Causes of Constipation

<b>Primary</b>		
Increased colonic mass movement of unknown etiology		
Impaired relaxation of the pelvic floor		
Congenital innervation disease (Hirschsprung’s disease)		
Rectocele, prolapse		
<b>Secondary</b>		
Medications	Opioids Anti-cholinergics Antipsychotics Calcium channel blockers Anti-Parkinson’s therapy Anticonvulsants Tricyclic antidepressants Iron Calcium Aluminum antacids Sucralfate	
Neurologic	Parkinson’s disease Spinal cord lesions CVA	Multiple sclerosis Muscular dystrophies Autonomic neuropathy
Dietary and environmental	Irregular bowel habit Immobility	Low-fibre diet
Mechanical	Colon cancer Extrinsic mass pressure Stricture (ischemic, radiation, diverticuli, post-surgical) Intussusception, volvulus Painful sphincter (fissure, hemorrhoids)	
Metabolic	Hypercalcaemia Hypokalemia Uremia	Hypocalcaemia Hypomagnesemia
Endocrine	Diabetes Hyperparathyroidism Porphyria Pregnancy	Hypothyroidism Addison’s disease Pheochromocytoma
Myopathies	Amyloidosis Myotonic dystrophies	Scleroderma
Psychiatric	Depression Eating disorders	Anxiety Somatization

Source: Thomas DR, et al. 2003.<sup>9</sup>

**Figure 1:** Abdominal Radiograph in Severe Constipation – Score 11/12



Source: Courtesy Dr. Hershl Berman.

pation, a supine flat view of the abdomen can be very helpful. A scoring system developed at Edmonton General Hospital can be used to assess severity (Figure 1). The presence of stool is quantified using a score of 0–3 in each of four quadrants (ascending, transverse, descending and recto-sigmoid), and a total of seven or greater indicates the need for aggressive management.<sup>15</sup> Unfortunately, radiologists rarely mention the score, so it is best to review the films personally.

Ultrasound, magnetic resonance imaging, and computed tomography may be useful in identifying lesions (such as an obstruction) that contribute to constipation. However, they are not currently helpful in assessing severity or quantifying stool burden.<sup>16</sup>

Extensive testing is reserved for those with severe symptoms and otherwise normal workup. This may include colonic transit studies and anorectal function tests.<sup>3</sup> In patients with red flag symptoms, such as a recent change in stool caliber and frequency, consideration should be given to ruling out a colonic malignancy.<sup>17</sup>

### Treatment

The main principle behind the treatment of constipation is to treat the underlying problem. For instance, correcting hypothyroidism or hypercalcaemia is preferable to using laxatives to

**Table 3:** Type of Laxatives

Type	Action	Agent	Comments
Bulk laxatives	Increased fibre when taken with water	Methylcellulose (Citrucel) Polycarbophil (FiberCon) Psyllium (Metamucil)	Good for constipation related to poor diet Should not be used for opioid-induced constipation
Stool softeners	Allow water to enter stool more readily	Docusate calcium (Surfak) Docusate sodium (Colace)	No laxative effect on their own: should be used with another laxative
Lubricant agents	Lubricate stool surface	Mineral oil	Often given as a retention enema
Osmotic laxatives	Hypertonic increase in stool water	Lactulose Magnesium citrate Magnesium hydroxide (Milk of Magnesia) Polyethylene glycol (MiraLax) Sodium biphosphate (Phospho-soda) Sorbitol	Use with caution in older adults and individuals with renal impairment
Stimulant laxatives	Increase peristalsis	Bisacodyl (Dulcolax) Cascara Sagrada Castor oil Senna (Senokot)	Usually required for opioid-induced constipation
Prokinetic agents	Increase peristalsis	Tegaserod (Zelnorm)	

Source: Thomas DR, et al. 2003<sup>9</sup> and Hsieh C, 2005.<sup>8</sup>



stimulate the bowel. However, as most cases of serious constipation have multifactorial causes,<sup>18</sup> treatment usually requires one or more laxatives which should be chosen based on the individual patient's needs.

### Laxatives

A number of classes of laxatives and stool softeners exist (Table 3). Understanding their mechanisms of action makes it easier to determine their roles in treating the constipated patient. In cases of severe constipation, it is generally best to start by softening and removing the hard stool below, then to treat from above.

### Fibre

Fibre absorbs water, increases stool bulk, and in doing so stimulates the bowel to decrease stool transit time. It is readily available in fruits and raw vegetables, whole grain breads and cereals or as an additive at health food stores. For those people who cannot add enough natural fibre to their diets, several formulations of bulk-forming psyllium products are available, in cookie, pill, or granule form, or as a powder added to juice or water. However, all these preparations are associated, at least initially, with increased flatulence.<sup>8</sup> A semi-synthetic fibre, methylcellulose, tends to decrease this side effect.<sup>5</sup>

Bulk-forming laxatives are first line therapy for people with normal functioning colons as they stimulate peristalsis.<sup>18</sup> They should not be used in patients with opiate-induced constipation.<sup>8</sup>

### Stool Softeners

Stool softeners, such as docusate sodium (or calcium) and mineral oil, are emollient laxatives which act by decreasing surface tension to allow water to enter the bowel more readily<sup>8</sup> making stool softer, which makes it easier and less painful to pass. Softeners are ineffective for chronic constipation but have a place for patients with anal fissures or hemorrhoids.<sup>8</sup> Mineral oil is not recommended because of its potential to deplete fat soluble vitamins and increase the risk of lipid aspiration pneumonia in patients

### Key Points

Constipation is a common complaint, especially in older adults. It results in millions of physician visits per year, with hundreds of millions of dollars spent on laxatives.

Constipation is not a benign condition. Case reports of deaths due to bowel perforation attributed to constipation have been published and other complications may include including hemorrhoids, anal fissures, rectal prolapse, fecal impaction, perforation, and overflow diarrhea.

Treatment of older adults is often complicated by comorbidities including polypharmacy and cognitive impairment. Like many illnesses, constipation is often easier to prevent than it is to treat. If left undiagnosed and untreated, constipation may lead to very serious complications and death.

A rational approach to the patient presenting with constipation includes a detailed history, general and focused physical examination, specific investigations, and appropriate therapy.

Treatment should aim to address the underlying cause, as should the choice of laxative.

In general, it is best to clear out hard stool in the distal bowel before using an aggressive oral regimen.

who have swallowing difficulties.<sup>9</sup> Overnight mineral oil retention enemas are often useful for softening and lubricating hard or impacted stool prior to starting aggressive oral measures.<sup>19</sup>

### Stimulant Laxatives

Stimulant laxatives increase bowel motility by stimulating the colon. This class of laxatives includes anthraquinones (senna, cascara) and bisacodyl, which may be administered either orally or rectally.<sup>18</sup> It is essential that all patients assigned to a regular dose of opioids be offered a stimulant laxative.<sup>8</sup>

### Osmotic Laxatives

Osmotic laxatives draw water into the bowel because they are hypertonic, essentially flushing the colon. Examples of osmotic laxatives include milk of magnesia (which also softens stools), sodium phosphates and magnesium citrate.<sup>8</sup> Although very effective, they should be used with caution in older adults and in patients with renal impairment because of the risk of dehydration and electrolyte disturbances.<sup>8</sup>

Nondigestible sugars (lactulose and sorbitol) are also osmotic laxatives. However, the former (lactulose) may be broken down by colonic flora and produce

an uncomfortable amount of gas.<sup>8</sup> For this reason, it is not considered a first-line treatment.

### Enemas

Sodium phosphates and soap suds in tap water, administered rectally, are quite effective in clearing the distal bowel. They should be considered in serious cases before using aggressive oral measures.

### Others

Polyethylene glycol acts in a similar way to the previous class of laxatives. As an iso-osmotic laxative, however, it causes no fluid or electrolyte shifts,<sup>3</sup> which makes it safer for use among older adults. Its main disadvantage is the volume of fluid (4 L) that needs to be ingested; many people, particularly older adults, are unable to tolerate this.

There are many alternative, non-medical therapies for constipation. They include but are not limited to herbal supplements, homeopathy, massage therapy, reflexology and yoga. Although potentially helpful, it is important to identify any such treatments and ensure that they do not interact with any medical therapy being offered.

### Conclusion

Constipation is a common condition, especially among older adults and the cause is often multifactorial. Treatment of older adults is often complicated by comorbidities including polypharmacy and cognitive impairment. Like many illnesses, constipation is often easier to prevent than it is to treat. If left undiagnosed and untreated, constipation may lead to very serious complications and death.

It is essential to use a rational, detailed approach to the evaluation of the patient with constipation. If possible, the underlying causes should be corrected, and laxatives should be tailored to the patients' needs.



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