

Clinical Consensus:

The Constipation Crisis in Long-Term Care



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Methods

This expert panel of interdisciplinary thought leaders representing academia and the medical community was assembled by Medical Education Resources (MER), a nonprofit medical education company, to review the existing literature and author this publication on the management of constipation in long-term care settings. Where evidence existed, it served as the basis for specific recommendations. In the absence of evidence, consensus was obtained. Programs in Medicine was selected to facilitate a teleconference and a closed Internet discussion forum to obtain consensus agreement by the panel on information presented within this publication.

SPONSORSHIP AND ACCREDITATION INFORMATION

Clinical Consensus: The Constipation Crisis in Long-Term Care

Target Audience

This program is intended for long-term care physicians, pharmacists, and nurses who treat elderly patients with constipation.

Educational Objectives

Upon completion of this program, participants should be able to:

- Define constipation in terms of functional status
- Describe the differential diagnosis
- Outline an effective management strategy

Program Completion Time

Based upon trials, the estimated time to complete this program is 1 hour.

Educational Grant

This program is made possible by an unrestricted educational grant from Braintree Laboratories, Inc.

Sponsorship

This activity is sponsored by Medical Education Resources Inc., a nonprofit medical education company. Programs in Medicine was selected to manage program logistics.

Physician Accreditation

Medical Education Resources is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor continuing medical education for physicians.

Credit Designation

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This CE activity was planned and produced in accordance with the ACCME Essentials.

Nursing Accreditation

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Clinical Consensus: The Constipation Crisis in Long-Term Care

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Dr. Richard Krause reported that he is a consultant for GlaxoSmithKline, TAP Pharmaceuticals, Inc., Novartis Pharmaceuticals, and AstraZeneca Pharmaceuticals. He serves on the Speakers' Bureau for GlaxoSmithKline, TAP Pharmaceuticals, Novartis Pharmaceuticals, Merck & Co., Inc., and AstraZeneca Pharmaceuticals.

Dr. Charlene M. Prather reported that she receives grant/research support from AstraZeneca Pharmaceuticals, Takeda Pharmaceuticals, Otsuka America Pharma, Inc., and Vela Pharmaceuticals, Inc. She serves as a consultant for Forest Laboratories, Inc., Solvay Pharmaceuticals, and Novartis Pharmaceuticals. She serves on the Speakers' Bureau for Novartis Pharmaceuticals.

Dr. William Rhoades reported that he is a consultant for Braintree Laboratories, Inc. He serves on the Speakers' Bureau for Novartis Pharmaceuticals, Janssen Pharmaceutica, Pfizer, Inc., and Eisai, Inc.

Dr. Laurie Forrester, Dr. F. Michael Gloth, III, Dr. Joseph Gruber, Dr. Laurence Rubenstein, and Dr. David Thomas reported that they do not have a financial arrangement or affiliation with commercial companies whose products may be mentioned in this program. Dr. Joseph Gruber and Dr. David Thomas indicated that they may discuss off-label use of products and will disclose this to the audience.

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Program Expiration Date: November 2005

It is a general rule that intestines become sluggish with age.

–Hippocrates

Constipation is greatly feared among older persons. Like all anxieties, exactly what is feared is not always clear. Patients have distinct but contradictory ideas about constipation. Most patients consider constipation to be passing of hard stools or straining to have a bowel movement. Moreover, physicians cannot agree on the definition of constipation. Most physicians take constipation to mean a decrease in frequency of stools. Thus, patient and physician are likely to be talking about entirely different sets of symptoms. Because of this definition problem, there is little correlation between self-reported constipation and number of bowel movements in epidemiologic surveys.¹⁻⁴ For this reason it is important during the history that baseline information be determined on bowel function, so that a patient's complaint of "constipation" can be evaluated properly.

A consensus definition of constipation requires two or more of the following factors present for at least 3 months: (1) straining with defecation at least one-fourth of the time; (2) lumpy or hard stools (or both) at least one-fourth of the time; (3) sensation of incomplete evacuation at least one-fourth of the time; or (4) two or fewer bowel movements in a week (Table I). This definition was proposed for the purpose of standardizing clinical trials rather than for clinical practice. Nevertheless, there is no generally accepted definition of constipation in clinical practice.

Using the research definition, constipation is self-reported by 3.5% of the population. Ninety-five percent of all individuals reported at least

three bowel movements per week, and 83.4% reported at least one bowel movement per day. Constipation is far more prevalent among women than men (4.9% vs 1.3%, respectively).⁵ These seemingly low prevalence rates seem to suggest that the criteria are too strict. The number of persons reporting constipation increases with age. Based on an epidemiologic analysis of almost 5 million persons in a combined database, the average prevalence of constipation was 2%, and this increased exponentially after age 65, reported in 10% of persons older than 75 years.⁶ In a survey of community-dwelling persons aged 65-93 years, 30% of men and 29% of women described themselves as constipated at least once a month. However, only 3% of men and 2% of women reported that their average stool frequency was less than three per week, highlighting the differing definitions of constipation among older persons.⁴ The frequency

TABLE I International Definition of Constipation

TWO OR MORE OF THE FOLLOWING FOR AT LEAST 12 MONTHS (WHEN NOT TAKING LAXATIVES):

- Straining at least 25% of the time
- Lumpy or hard stools at least 25% of the time
- Feeling of incomplete evacuation at least 25% of the time
- Two or fewer bowel movements in a week

Source: Whitehead WE, Chaussade S, Corazziari E, Kumar D. Report of an international workshop on management of constipation. *Gastroenterol Int* 1991; 4:99-113. The purpose of the definition in this table is to set guidelines for research studies in constipation. Clinical definitions tend to be less rigorous.

of bowel movements is not decreased with normal aging, nor does aging alone seem to slow intestinal transit;⁷⁻⁹ however, few studies have been performed in the oldest old. An overview of constipation frequency studies is given in Table II.

A Brief History of Constipation

Egyptian physicians, in the oldest complete “book” in existence, offered the opinion that poisoning of the body by decomposing waste in the intestines was a basic explanation of disease.¹⁰ In the mid-1880s, bacteriologists demonstrated that intestinal flora broke down protein residues in feces into compounds that produced pronounced toxicity when injected into animals. It was a simple step to reason that these substances could be absorbed into the bloodstream.

The medical profession has brought the confusion about constipation upon itself. In the 19th century, American

health manuals warned that, “daily evacuation of the bowels is of the utmost importance to the maintenance of health,” and that without the daily movement, “the entire system will become deranged and corrupted.”¹¹ Leading physicians in the early 20th century formulated a theory of intestinal autointoxication, or self-poisoning from one’s own retained wastes. The constipated person “is always working toward his own destruction; he makes continual attempts at suicide by intoxication.”¹²

From 1900-1920, autointoxication was regarded by physicians and the public as the most widespread cause of disease. In books such as *The Conquest of Constipation*, *The Lazy Colon*, and *Le Colon Homicide*, physicians warned that the contents of the colon were “a burden, fermenting, decomposing, putrefying, filling the body with poisonous substances” and creating “sewer-like blood.”¹³ Autointoxication was seen as “the cause of

TABLE II Frequency of Constipation in Selected Populations

STUDY	DEFINITION	FREQUENCY
Olmsted County, Minnesota (age range, 30-64 years) ⁵¹	Two or more: fewer than 3 bowel movements per week more than 25% of the time; straining more than 25% of the time; sense of incomplete evacuation on more than 25% of occasions; and hard stools on more than 25% of occasions	20%
Healthy people ⁵²	Straining more than 25% of the time	6%
Marketing survey (mean age, 49 ± 16 years) ⁵³		3% (2.4% male, 4.8% female)
Epidemiologic analyses of 5 million persons ⁵⁴		2%, increasing after age 65 to 10% in persons older than 75
Population-based study of persons older than 65 years of age ⁵⁵	Straining, incomplete evacuation, difficulty or pain with defecation, or hard stools	26% of men and 34% of women
Community-dwelling (12-74 years) ⁵⁶	Self-report; however, 9% reported daily stools and 30.6% reported 4-6 stools per week	12.8%

Note: The frequency of reported constipation varies with the definition used. See text.

ninety percent of disease," and it was determined that "constipation shortens life."¹⁴

Anxiety about autointoxication led to marketing of anti-constipation foods, drugs, and devices. All-Bran[®] and other bran cereals were introduced in the early 1900s to combat autointoxication. Yeast was heavily promoted as a preventive, and yogurt was regarded as a health food specifically for preventing autointoxication. The early 20th century became the golden age of laxatives. Phenolphthalein, introduced as a cathartic in 1900, became the best selling of all laxatives and was particularly targeted to children.

The fear of autointoxication became ingrained in the public's mind. It did not matter that later studies questioned the absorption of toxins into the bloodstream, or that physicians slowly abandoned the theory of autointoxication in the late 1920s.

The anxiety of not having adequate bowel movements was resurrected in the 1970s and 1980s by the dietary fiber theory. Reports of the rarity of colon cancer, appendicitis, and gastric and duodenal ulcer among the grain-eating Hunza of northern India intrigued epidemiologists. The low-fiber diet of urban, industrialized societies was suspected of being disease-producing. Burkitt et al¹⁵ drew attention to the importance of stool weight and transit time, showing in 1972 that Ugandans eating a high-fiber diet produced stools that were four times as heavy and that passed through the gut in half the time as those of British sailors. Proponents observed that, "constipation is the commonest Western disease."¹⁶ In a survey in London, England, in the mid-1980s involving 171 patients 55 years and older, 90% believed that "regularity" was necessary for good health, although 10% reported no predictable frequency of bowel movements.¹⁷

Further research has called into question the protective effect of fiber on colon cancer,¹⁸ but other effects on cholesterol and purported health benefits have fixed the public's mind. The public believes, no matter what physicians say, that having a daily bowel movement is important to health. This is particularly true of older persons, who grew up when the autointoxication theory was well accepted

by parents and by the medical profession. This has resulted in up to 50-60% of the elderly regularly using laxatives as a preventive measure as well as a treatment for actual constipation.

Causes of Constipation

Constipation has been attributed to a myriad of causes. In order to approach the differential diagnosis, some framework must be constructed. A framework for differential diagnosis is given in Table III.

Primary Factors

The primary function of the colon includes absorption of fluids and electrolytes, transit of colonic contents, and evacuation of rectal contents. Colonic dysfunction can be grouped into constipation associated with normal transit time, with defecatory disorders, or with a slow transit time. The most common cause of constipation is "functional," that is, constipation in the presence of a normal colonic transit time of about 72 hours. The patient perceives difficulty with evacuation or the presence of hard stools. A second group of disorders causing constipation is classified under defecatory disorders. These defecatory disorders involve the pelvic floor or anal sphincter. A third group of constipation disorders involves slow colonic transit time. These disorders most frequently are associated with neuronal responses affecting gastrointestinal motility.

In a study of 190 patients in whom irritable bowel syndrome and other identifiable causes of severe constipation were excluded, 59% had disordered defecation, 27% had slow-transit constipation, and 6% had a combination of these two causes. No pathology was identified in about 8% of these patients.¹⁹ In a series of patients presenting for surgical intervention, irritable bowel syndrome (59%) was the most common primary cause of severe intractable constipation, followed by pelvic floor dysfunction (25%), slow-transit constipation (5%), and combined slow-transit constipation and pelvic floor dysfunction (2%).²⁰

Normal defecation requires relaxation of the pelvic floor—particularly the anal sphincter, adequate rectal tone, and sensation of rectal filling. Normal sensation of

rectal filling is key to providing motivation, a learned response, and underlines the cognitive component of normal defecatory function.

High resting pressure in the anal canal or failure of anal sphincter relaxation during defecation (or both) impedes the outflow of stool. This pelvic outlet dysfunction is commonly termed *anismus*. The *puborectalis syndrome* refers to failure of the puborectalis to relax or a paradoxical increase in contraction with straining, the result of which is a functional obstruction to stool outflow. The *descending perineum syndrome* describes excessive ballooning of the perineum—usually the result of years of straining, multiple vaginal deliveries, and poor defecation dynamics. While rectoceles and enteroceles may obstruct defecation and occur as the result of years of straining, they rarely cause constipation.

Secondary Factors

A large number of medical conditions cause or are associated with constipation. A careful history and physical examination can uncover many of these conditions.

Environmental Factors. The public and most physicians firmly believe that inadequate fluid and fiber intake leads to constipation. Yet, the relationship of dietary fiber and constipation has not been well established in older persons, or in constipation in pregnant women.²¹ There was no difference in fiber intake between nursing home residents who consumed daily laxatives for constipation, and nonconstipated community-dwelling controls. In fact, the nonconstipated controls actually consumed less

TABLE III

Conditions Associated With Constipation

PRIMARY		
Decreased colonic mass movement of unknown etiology		
Impaired relaxation of the pelvic floor muscles or sphincter		
Congenital innervation defect (Hirschsprung's disease)		
Rectocele, prolapse		
SECONDARY		
Neurological	Cerebrovascular disease	30-40% admission; 9% at 6 months
	Parkinson's disease	50%
	Multiple sclerosis	43%
	Spinal cord injury	17%
	Shy-Drager syndrome	
Dietary and Environmental	Irregular bowel habit	
	Low-fiber diet	See text
	Immobility	
Mechanical	Colon cancer	
	Extrinsic mass pressure	
	Stricture (ischemic, radiation, diverticular, post-surgical)	
	Intussusception, volvulus	
	Painful sphincter (fissure, hemorrhoids)	
Metabolic	Hypercalcemia	
	Hypokalemia	
	Hypomagnesemia	
	Uremia	
Endocrine	Diabetes mellitus	60-88% ⁵⁷
	Hypothyroidism	
	Hyperparathyroidism	
	Addison's disease	
	Porphyria	
	Pheochromocytoma	
	Pregnancy	
Myopathies	Amyloidosis	
	Scleroderma	
	Myotonic dystrophy	
Psychiatric	Depression	
	Anxiety	
	Somatization	
IATROGENIC		
Drugs	See Table IV	

fiber.²² However, in most studies, increased dietary fiber intake leads to decreased colonic transit time and bulkier stools.²³

Evidence for the association of inadequate fluid intake with constipation is sparse. In studies of children, there is no relationship of fluid intake to constipation.²⁴ Hydration status has been associated with fecal impaction, but not with the incidence of constipation.²⁵

Medical Conditions. In a community sample of patients with diabetes mellitus, constipation was the most common gastrointestinal complaint.²⁶ Neurologic disorders, including autonomic neuropathy, multiple sclerosis, Parkinson's disease, and spinal cord injury, may be associated with constipation. Other systemic disorders associated with constipation include hypercalcemia (eg, hyperparathyroidism) and hypothyroidism. Patients with renal failure may also

complain of constipation. Other acquired conditions contributing to constipation include anal fissure, mass lesion (eg, rectal cancer), mucosal prolapse, Crohn's disease of the anorectum, or stricture (benign or malignant).

Pharmacologic Factors. Drugs are one of the leading causes of constipation. Almost any drug can cause constipation. Those drugs that affect the central nervous system, nerve conduction, and smooth muscle function account for the highest frequency. Drugs that are associated with the highest frequency of constipation are shown in Table IV. However, almost all drug classes—including antispasmodics, analgesics, barbiturates, antidepressants (both tricyclic and serotonin reuptake inhibitors), antipsychotics, antiparkinsonian drugs, antihistamines, antacids, diuretics, antiarrhythmics, antiepileptics, and benzodiazepines—have been associated with constipation.

The first step should be to evaluate the pharmacologic regimen and eliminate offending drugs. However, physicians find that the drug therapy must be continued even in the face of constipation, particularly in pain management.

TABLE IV Drugs Associated With Constipation at a Frequency of 10% or Greater

GENERAL MEDICATIONS	APPROXIMATE INCIDENCE
Clonidine	10%
Ursodiol	9.7-26.4%
Colesevelan	11%
Alprazolam	10.4-26.2%
Epoetin alfa	42-53%
Flebamate	6.9-12.9%
Proamipexole	10-14%
Mitoxantrone	10-14%
Pamidronate	33.2%
Ondansetron	11%
Zoledronic acid	26.7-28%
Progesterone	27%
Oxybutynin XL	22%
Alosetron	29%
PAIN MEDICATIONS	
Choline magnesium trisalicylate	< 20%
Oxycodone	23%
Tramadol	24-46%
Hydrocodone bitartrate with ibuprofen	22%
Fentanyl, transdermal	>10%
Morphine	28-70%
PSYCHOACTIVE MEDICATIONS	
Venlafaxine	15%
Mirtazapine	13%
Nefazodone	10-17%
Bupropion	26%

Examples of reported rates of constipation for selected drugs. The data are derived from single reports or package labeling. The list is not comprehensive, and serves only as examples. The frequency of constipation cannot be compared across drug categories using this table.

Management of Constipation

The best strategy for managing constipation is to divide the symptoms into degrees of severity. The first step is to take a careful history, remembering that the patient often is talking about an entirely different symptom complex. Patients may report that they are constipated, but when formally evaluated by daily diary during a 4-week period, only 45% of constipated patients had fewer than three bowel movements per week.²⁷ The perception of hard stools or excessive straining is more difficult to assess objectively, and the need for enemas or digital disimpaction may be more clinically useful markers to corroborate the patient's perceptions of difficult defecation. A careful history should explore the patient's symptoms and confirm whether he or she is indeed constipated based on frequency (such as fewer than three bowel movements per week), consistency (lumpy or hard), or excessive straining as shown by prolonged defecation time or need to support the perineum or digitate the anorectum. Certainly the patient's complaints should not be ignored, but realistic goals of treatment need to be established.

A multidisciplinary approach should be used with: (1) the physician assessing for predisposing disease states and medications; (2) nurses and aides spending adequate time assisting patients with toileting and hydration, appropriate use of as-needed laxatives, and consistent and adequate description of bowel movements; (3) consultant pharmacists assessing predisposing medications and making recommendations for dosage reductions or agent changes, as appropriate; and (4) dietitians assisting with fluid and fiber content of the diet.

First-Line Management Strategies

General advice usually given to patients includes regulation of bowel habits, engaging in moderate exercise, increasing fiber in the diet, and increasing water intake. In long-term care settings, this advice to residents and facility staff is often difficult to implement. The lack of privacy and disrupted routines contribute to disordered bowel regimens. It is important to encourage patients and educate nursing home staff in attempting to stimulate defecation 30 minutes after meals to take advantage of the gastrocolic reflex.

The generally recommended fiber intake is 20-35 g of fiber per day, whereas most healthy Americans consume only 5-10 g of fiber per day. The fiber should be consumed as wheat or oat bran, since bran increases colonic transit time better than fruits, vegetables, or nuts. It is difficult for chronically ill adults to ingest a large amount of bran. If extra fiber is added, it should be done slowly to avoid excessive gas. The recommended rate of increasing the fiber dosage is to begin with 5 g per day and go up by 5 g per day each week until the target dose is achieved with good tolerance and minimal gas and bloating.

Only minimal scientific evidence supports the use of increased fluid intake or exercise, although both are often recommended.²⁸ Even endurance athletes continue to experience constipation.²⁹ Compared to nonconstipated subjects, colonic transit time is unrelated to crude or dietary fiber intake, activity level, or age in constipated persons older than 60 years.³⁰ Self-reported constipation was not related to fiber or liquids in community-dwelling men or women aged 65-93 years.⁴ Increases in fluid intake does not appear to relieve chronic constipation, except in persons who are dehydrated.²⁴ Generally recommended amounts of water intake to prevent dehydration should be calculated at 30 cc/kg per day. Moderate exercise is desirable, but may be difficult to achieve in functionally impaired adults. Moreover, regular exercise has not been shown to relieve chronic constipation.³¹

Second-Line Management Strategies

Treatment for continued constipation after first-line treatment strategies have failed most often will include use of laxatives. Laxatives can be divided into several groups defined by pharmacologic action (Table V).

Bulk Laxatives. Bulk laxatives may contain soluble (psyllium, pectin, or guar) or insoluble (cellulose) products. Both types of laxatives absorb water from the intestinal lumen and increase stool mass. Because bulk laxatives rely on reflex stimulation of colonic peristalsis, they are contraindicated in the presence of obstruction or compromised peristaltic activity.

Stool Softeners. Clinical studies have shown very little effect when these agents are given to older adults with restricted mobility.³²⁻³⁴ A randomized trial comparing stool softeners with psyllium found psyllium to be more effective.³⁵ The therapeutic use of stool softeners should be limited to patients in whom excessive straining or painful defecation occurs due to anal fissure or hemorrhoids (a primary cause of constipation). Stool softeners are often used in patients at high risk for developing constipation.³⁶

Osmotic Laxatives. These agents are generally safe and effective for reversing constipation by retention or secretion of water into the intestinal lumen by osmotic activity. The side effects depend in part on whether the substrate is metabolized by gut flora. In those products that are digested to some extent, production of gases may lead to flatulence, abdominal bloating, or cramping. Some components of osmotically active products may be absorbed, and are contraindicated in some medical con-

TABLE V

Laxatives by Type and Action

TYPE	ACTION	EXAMPLES
Bulk laxatives	Increased fiber when taken with water	Metamucil [®] , Citrucel [®] , Serutan [®] , Perdiem [®] , Konsyl [®] , FiberCon [®] , Maltsupex [®]
Stool softeners	Surfactant wetting agent	Colace [®] , Dialose [®] , Surfak [®] , Modane [®]
Lubricant agents	Lubricate stool surface	Mineral oil
Saline	Hypertonic increase in stool water	Milk of magnesia, Citrate of magnesia, Haley's M-O [®] , Fleet [®] Phospho-soda [®]
Stimulants (diphenylmethanes)	Increase peristalsis	Dulcolax [®]
Stimulants (anthraquinones)	Increase peristalsis	Cascara, senna, Senokot [®] , Correctol [®] , Ex-Lax [®] , Feen-A-Mint [®] , Fletcher's Castoria [®] , Black-Draught [®] , aloe
Stimulants (castor oil)	Increase peristalsis	Purge [®] , Emulsoil [®]
Osmotic agents	Hypertonic increase in stool water	Sorbitol, Chronulac [®] , Duphalac [®] , MiraLax [™]
Rectal enemas and suppositories	Local stimulant to increase peristalsis	Fleet [®] Phospho-soda [®] , soap suds enema, mineral oil, bisacodyl, glycerine
Prokinetic agents	Increase peristalsis	Investigational

Examples of laxatives within certain categories are given. The list does not include all marketed laxatives.

ditions. The chemical components of the saline cathartics may be absorbed, and are contraindicated in some medical conditions. For example, magnesium-containing products should not be used in chronic renal failure, and sodium-containing products may result in hypernatremia.

Stimulant Laxatives. Laxatives containing senna increase peristalsis and increase secretion of water into the bowel. These laxatives tend to be more harsh, and are contraindicated in suspected intestinal obstruction. Several senna-containing laxatives are enhanced with the combination of fiber or detergent (docusate). A combination of senna and a bulk agent has been shown to be effective in a long-term care setting.³⁷

Prokinetic Agents. A number of prokinetic agents have been used in the treatment of constipation. Cholinergic agonists (bethanechol, neostigmine) have not been shown to have clinical benefit. Metoclopramide and erythromycin act predominately on the upper gastrointestinal tract and have shown little effect on constipation.

Comparative Trials Among Laxatives

Almost all marketed laxatives are superior to placebo in clinical trials. For example, polyethylene glycol 3350 (MiraLax™) has been shown to increase daily bowel movement frequency by 60% compared to placebo. In a literature review from 1966-1995, a total of 36 clinical trials involving 1815 participants were found. Thirteen of 20 trials involving single agents and reporting bowel movement frequency showed an increase in the mean bowel movement frequency per week with laxative or fiber use (5.0 for treatment vs 3.5 bowel movements/wk for control, 95% CI for the weighted 1.4 difference, 1.1 to 1.8). Five of 16 trials that compared different active laxatives showed a difference in bowel movement frequency.³⁸ Thus, there are few comparative clinical studies of the commonly used laxatives.

There are no data to suggest that bulk laxatives are more effective than other classes of laxative. However, bulk laxatives are often the first prescribed because of their safety. A saline or osmotic laxative can be added if

the bulk laxative fails. Stimulant laxatives should be reserved for cases in which bulk, saline, and osmotic laxatives are ineffective. The emollient laxative, mineral oil, should be avoided because it has been associated with lipoid aspiration pneumonia.

In 77 elderly patients with a history of chronic constipation in long-term hospital or nursing home care, a combination of ispaghula fiber (54.2%) and senna (12.4%) produced greater mean daily bowel frequency (0.8, 95% CI, 0.7 to 0.9) compared to lactulose (0.6, 0.5 to 0.7).³⁹

Low-dose polyethylene glycol 3350 was more effective than lactulose and better tolerated in a multicenter, randomized, comparative trial of 99 patients with chronic constipation.⁴⁰ Polyethylene glycol 3350 has some advantages because it is not fermented. Gas and cramps are minimal. In contrast, lactulose and sorbitol, which are poorly absorbed sugars, have a rapid onset of action, but flatulence and abdominal distention may limit tolerance. Sorbitol is generally less expensive than lactulose.

Polyethylene glycol/electrolyte solution is equally effective as the osmotic laxatives lactulose or sorbitol, but is better tolerated.⁴¹ In a multicenter trial of 164 patients, lactulose was compared to laxatives containing senna, anthraquinone derivatives, or bisacodyl. The lactulose preparation was more effective than the other laxatives in producing a normal stool by day 7 in 58% of the lactulose-treated group, compared to 42% of the patients treated with the other laxatives.⁴²

Constipation Related to Pharmacologic Agents

For drug-induced constipation, the obvious strategy is to discontinue the offending agent. However, very often in clinical practice the offending drug cannot be discontinued. In chronic pain management situations, and in other situations such as Parkinson's disease, the primary therapy must be continued in spite of the effects on bowel function. For these patients, a careful palliative management program for constipation must be initiated.

Some drugs (eg, verapamil) cause more constipation than others, and in that case, an alternative drug in the

same class could be used, if appropriate for the patient. In many other areas, the medication class may continue to be required, but not necessarily that particular medication in the class. Among psychotropic medications, many agents have anticholinergic effects. Whether the anticholinergic effect just causes problems for patients with dementia, causes delirium, or rises to the level of constipation and fecal impaction is a patient-by-patient review. One antipsychotic reported to have relatively high anticholinergic tone, olanzapine, is associated with higher prevalence of laxative use in nursing home patients. The mean number of doses of laxative administered was 14.2% in the olanzapine group, and 4.1% in the risperidone group ($P = 0.001$).⁴³ If continued use of medication is necessary to treat a chronic condition, the multidisciplinary team may be able to identify an alternative agent that will address the patient's pharmacologic needs, and possess a side-effect profile that may be more benign relative to new incidence of constipation. Anticholinergic medications in particular may pose risks for the elderly patient.

Constipation is an important medical comorbidity in 40-50% of patients who receive chronic opioid therapy.⁴⁴ Constipation is the most common side effect of opioids. Whereas tolerance develops to most other side effects, it does not develop to constipation. Opioids inhibit gastric emptying and propulsive motor activity of the intestine. The result is decreased transit time and constipation. Therefore, based on the literature, correction of constipation associated with opioid use requires a senna or osmotic laxative to overcome the strong opioid effect. Stool softeners and bulking agents alone are inadequate because opioid-related constipation results from slowed gut motility. A recommended model suggests that a senna or osmotic laxative should be used if there is no bowel movement in 2 days, and an osmotic enema should be used if there is no bowel movement in 3 days. A prophylactic bowel regimen should be initiated whenever a patient is started on opioid pain medications.

One study suggests that methadone may be associated with less constipation than morphine,⁴⁵ and another trial found that there was less constipation with fentanyl compared to morphine (29% vs 48%).⁴⁶

Intractable Constipation

Perhaps fewer than 1% of persons have constipation that fails symptomatic treatment. Physiological testing is necessary only in persons with refractory symptoms who do not have a secondary cause of constipation, or in whom a trial of a high-fiber diet and laxatives was not effective. In these persons, tertiary referral is often necessary. Physiologic tests of colonic motor function include colonic transit tests and intraluminal testing. Colonic transit time should be measured in patients who fail to respond to secondary strategies using simple radiology techniques. For the colonic transit study, a plain radiograph is taken at variable times after the patient has ingested radiopaque markers. The number of markers passed within a given period provides an assessment of colonic motility. There is no standardized protocol for this test, and many different approaches are used.

If the transit time is normal, the probability of a psychological or behavioral disorder must be considered. If the transit time is prolonged (more than 20% of ingested markers are still in the colon after 5 days), referral to a center equipped to do specialized studies is indicated. Balloon expulsion testing helps evaluate for outlet obstruction. After insertion of a latex balloon in the rectum, 50 mL of water or air is instilled into the balloon. The patient is asked to expel the balloon into a toilet. Failure to expel the balloon within 2 minutes suggests a defecatory disorder.⁴⁷ When test results show pelvic floor dysfunction, behavioral treatments such as biofeedback are successful in about 70% of patients.⁴⁸ Only a few patients with intractable constipation and persistently slow transit despite medical therapy should be considered for surgery, such as a subtotal colectomy with ileorectostomy.

Management of intractable constipation that is not responsive to conventional agents may require novel therapy. Colchicine, which predictably produces diarrhea when used in the treatment of gout, has been shown to increase weekly bowel movements from 2.7 ± 1.8 to 9.9 ± 5.3 in a small trial of 16 subjects with constipation ($P < 0.001$).⁴⁹ Neuromyopathy and multiorgan failure have been reported with colchicine, so the drug must be used with caution. Prokinetic drugs such as tegaserod have been used for con-

stipation-predominant irritable bowel syndrome in women, but are not indicated for the treatment of constipation.⁵⁰ Concerns about long-term safety of prokinetic agents may limit the use of these drugs. In some of the pain management literature, recommendations for the use of misoprostol in refractory constipation have been made, but there are no controlled clinical studies.

Summary

While constipation is frequently encountered in long-term care residents, very little research has been done in this pop-

ulation. Most of the recommendations for the management of constipation in nursing homes have been derived from other populations. Nevertheless, the impact of constipation is considerable in long-term care residents. This population includes persons with the highest frequency of risk factors, including immobility, polypharmacy, and chronic medical conditions. Constipation has a large impact on the quality of life for older persons and can lead to medical complications such as fecal impaction. A careful history and structured differential diagnosis can result in significant improvement in conquering constipation in long-term care residents.

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CE TEST QUESTIONNAIRE

Clinical Consensus: The Constipation Crisis in Long-Term Care

Using a scale from 1 to 5, with 5=excellent, 4=very good, 3=adequate, 2=fair, 1=poor, please circle the number corresponding to your rating of the following:

	Excellent				Poor
1. Overall quality of the material	5	4	3	2	1
2. Clinical applicability or relevance of the material to participant's practice	5	4	3	2	1
3. Extent to which the material met stated objectives	5	4	3	2	1
4. Extent to which participant will modify his/her practice as a result of participation in the program	5	4	3	2	1
5. Fair balance and objectivity of the material	5	4	3	2	1
6. Completion time	5	4	3	2	1

Please answer the following questions:

- The research definition of constipation includes
 - straining with defecation at least one-fourth of the time.
 - lumpy or hard stools (or both) at least one-fourth of the time.
 - two or fewer bowel movements in a week.
 - all of the above
- Colonic dysfunction includes
 - normal transit time.
 - slow transit time.
 - defecatory disorders.
 - all of the above
- The frequency of bowel movements and colonic transit time does not decrease with normal aging.
 - True
 - False
- The most common cause of constipation is constipation in the presence of a normal colonic transit time.
 - True
 - False
- Constipation is a medical comorbidity in 40% of patients who receive chronic opioid therapy.
 - True
 - False

Please provide the following information (please print) in order to receive your CE certificate:

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