Special Report

ASSESSING AND MANAGING NARCOTIC-INDUCED CONSTIPATION IN ADULTS WITH CANCER

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Introduction

Constipation is a common problem among persons receiving narcotics for treatment of pain. Although it occurs very commonly, it is often underassessed and undertreated by both physicians and nurses, leaving patients to grapple with this problem alone.\(^1\)\(^-\)\(^5\) Because patients often do not understand the mechanism that is causing the constipation, their self-treatment may be less than effective. Narcotic-induced constipation is a problem caused by the treatment provided by health care professionals and thus is a problem that should be addressed by them.

Prevalence

Limited studies of prevalence of constipation have been conducted on healthy persons or on persons with cancer. Prevalence in the general population is believed to be approximately 2%. Among the elderly in long-term care facilities, prevalence of constipation ranges between 40% and 50%. Although overall prevalence among persons with cancer is unknown, some studies investigated patients receiving hospice care and active curative treatment. Studies of hospitalized patients receiving cancer treatment ranged from 70% to 100%.\(^2\)\(^-\)\(^4\) Studies of patients with advanced cancer who are receiving hospice care show prevalence of constipation to range between 23% and 84%.\(^2\),\(^3\),\(^5\)-\(^9\) Walsh\(^6\) found constipation to be the most common side effect of morphine among 688 hospice patients with a prevalence of 48%.

Defining Constipation

A significant problem in assessing constipation has been the varying definitions used by patients and health care providers. Some patients believe they are constipated if they do not have a bowel movement every day. Other patients expect to have only three bowel movements per week, so if they have three, they believe they are not constipated—and in both cases these patients may (or may not) be correct. One of the largest studies of bowel function ever conducted was reported in 1965.\(^10\) Of the 1,055 persons included in the study, 99% reported bowel movements in the range of three per day to three per week. Any number outside of this range was considered by these researchers to be abnormal. However, with such a wide range of normal, it is easy to see how misleading it would be to characterize a person as constipated solely on the basis of the number of bowel movements.

Others have attempted to define constipation by looking at more than just frequency of bowel movements. Table 1 lists 22 defining characteristics of constipation resulting from a study of 300 healthy adults by McShane and McLane in 1985.\(^11\) The Constipation Assessment Scale, first published in 1989, presents eight characteristic symptoms and allows the patient to self-report on a valid and reliable scale.\(^4\) These symptoms are also presented in Table 1.

<table>
<thead>
<tr>
<th>McShane and McLane (1985)(^11)</th>
<th>McMillan and Williams (1989)(^4)</th>
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<tbody>
<tr>
<td>Abdominal distention</td>
<td>Inability to pass stool</td>
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<tr>
<td>Abdominal growling</td>
<td>Increased abdominal pressure</td>
</tr>
<tr>
<td>Abdominal mass</td>
<td>Indigestion</td>
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<tr>
<td>Abdominal pain</td>
<td>Oozing liquid stool</td>
</tr>
<tr>
<td>Blood with stool</td>
<td>Rectal fullness</td>
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<tr>
<td>Change in abdominal size</td>
<td>Rectal mass</td>
</tr>
<tr>
<td>Change in flatus</td>
<td>Rectal pain with stool</td>
</tr>
<tr>
<td>Change in frequency</td>
<td>Rectal pain at bowel movement</td>
</tr>
<tr>
<td>Decreased appetite</td>
<td>Small volume of stool</td>
</tr>
<tr>
<td>Dry, hard stool</td>
<td>Straining at stool</td>
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<tr>
<td>Headache</td>
<td>Swollen rectal veins</td>
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</table>

An acceptable definition of constipation for clinical practice would be the following: a decrease in the frequency of passage of formed stools and characterized by stools that are hard and difficult to pass.

This definition suggests four characteristics that may be presented in the acronym DISH: difficult to pass, infrequent compared to normal, smaller than normal, and hard.

Etiologies

Although narcotics are a common cause of constipation in persons with cancer, there are many other potential causes as well. Constipation may be classified into one of
three types: primary, secondary, or iatrogenically induced (Table 2). Narcotic-induced constipation falls under the third category.

### Effects of Opiate Narcotics

Opiates affect bowel function in a variety of ways. First, opiates delay gastric emptying by producing gastroparesis secondary to spasm in the antral pyloric region. This action appears to stem from the central nervous system and be dopamine mediated. Opiates also delay stool transit through the small bowel, thus increasing transit time. This effect is greatest in the jejunum and is related to an increase in nonpropulsive contractions. Colonic transit time also is increased. The basis for this physiologic response to opiates was studied in the 1940s, before the days of the modern institutional review board and protection of human subjects. Researchers administering varying doses of morphine and hydromorphone to healthy male volunteers and studied the responses of the ileum and colon. The drugs significantly increased the amount of time needed for fecal material to move through by interfering with normal tone and contractility. While segmental motor tone and contractility were increased, longitudinal propulsive peristalsis was decreased. Churning motions occurred in some cases but without adequate propulsive activity. The change in peristalsis began to occur 5 to 25 minutes after the administration of the opiate, depending on the amount of the dose.

Opiates also may cause the patient to experience a decreased urge to defecate. The constipating effect of morphine was confirmed in 1989 by a group of patients receiving at least 30 mg of morphine per day; evaluation showed that 100% of these patients were constipated. In summary, opiates decrease peristalsis and increase stool transit time, drying out the stool and causing constipation. The effect is immediate and is dose related. Treatment of narcotic-induced constipation should be based on an understanding of this physiologic response to opiates.

### Assessing Constipation

Since managing constipation requires a complete understanding of the origins of the problem, complete assessment is critical. However, most patients are attuned to self-management of constipation and may not think to mention it to a health care provider. Thus, patients at risk must be asked specifically about their bowel function. If a patient is receiving opiate analgesics, he or she will have a problem with constipation. However, there may be other complicating factors that need attention.

### History

On the patient's history, the essential information to obtain includes: (1) daily activity level, including participation in regular exercise, (2) food preferences and dislikes, (3) amount of fiber and fluid intake, (4) ability to chew and swallow, (5) current medications, including over-the-counter drugs (Table 2), (6) underlying medical problems (Table 2), and (7) recent changes in stool or bowel habits, eg, pain with stool, change in pattern or size of stool, diarrhea alternating with constipation accompanied by abdominal pain or discomfort, bright red blood or black tarry appearance of stools (ask for time of last bowel movement). In addition, a change in mental status with confusion and increased agitation, elevated temperature, incontinence,

and unexplained falls may sometimes be the only presenting symptoms of constipation in the elderly; therefore, maintain a high index of suspicion.

### Physical Examination

A complete physical examination is essential when constipation is suspected. This examination must include oral, abdominal, and anorectal examinations.

### Oral Examination

Dentition should be checked to ensure adequacy of chewing, and the oral cavity should be examined for lesions or tumors that could interfere with chewing, tasting, or swallowing. Not uncommonly, ill-fitting dentures make chewing so difficult or uncomfortable that the elderly patient takes the path of least resistance and

<table>
<thead>
<tr>
<th>Primary</th>
<th>Secondary</th>
<th>Iatrogenically Induced</th>
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<tr>
<td>Due to:</td>
<td>Due to:</td>
<td>Due to drugs such as:</td>
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<tr>
<td>Lack of fiber, exercise, fluid, or time and privacy for defecating</td>
<td>Parkinson's disease*</td>
<td>Antacids</td>
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<tr>
<td>Intestinal obstruction</td>
<td>Anticholinergics</td>
<td></td>
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<tr>
<td>Diverticulosis</td>
<td>Antidepressants</td>
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<tr>
<td>Adhesions</td>
<td>Antihistamines</td>
<td></td>
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<tr>
<td>Stroke</td>
<td>Barium sulfate</td>
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<tr>
<td>Hypercalcemia</td>
<td>Calcium channel blockers</td>
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<tr>
<td>Hypokalemia</td>
<td>Drugs for Parkinsonism*</td>
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<tr>
<td>Diverticulosis</td>
<td>Ganglionic blockers</td>
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<tr>
<td>Spinal cord compression</td>
<td>Hypotensives</td>
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<tr>
<td>Rectocele</td>
<td>Iron supplements</td>
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<tr>
<td>Rectocele</td>
<td>Monoamine oxidase inhibitors</td>
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<tr>
<td>Opiates</td>
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<tr>
<td>Psychotherapeutic drugs</td>
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<tr>
<td>Vinca alkaloids**</td>
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* Controversy remains about whether constipation is caused by drugs for Parkinsonism, the disease itself, or both.

** In one study, 100% of patients receiving vinblastine, a vinca alkaloid, became constipated and one had paralytic ileus.
**Abdominal Examination:** The patient should empty the bladder before the examination begins. **Inspection:** Begin by looking for bloating, distention, or bulges. When distention is noted, consider the possibility of obesity, fluid, flatus, or tumor. If these are ruled out, then the possibility of feces must be considered. **Auscultation:** Listen for hyperactive bowel sounds or absent bowel sounds. If no bowel sounds are readily heard, listen continuously for five minutes before establishing the absence of bowel sounds. Absent bowel sounds may indicate paralytic ileus, whereas increased bowel sounds may indicate impending diarrhea. **Percussion:** On percussion, gas in the colon produces tympany. Dullness is heard over intestinal fluid and feces. **Palpation:** Light palpation can detect abdominal tenderness and muscular resistance associated with chronic constipation. When abdominal pain occurs on coughing or with light palpation and/or when rebound tenderness is detected, peritoneal inflammation must be suspected. Deep palpation may be used to detect abdominal masses including a sausage-like mass of fecal material in the left colon. A feces-filled colon is suggestive of constipation.

**Anorectal Examination:** A digital rectal examination may reveal a stool-filled rectum, suggesting constipation. Endoscopic examination of the anus and rectum can reveal not only an impacted fecal mass, but also fissures, hemorrhoids, ulceration, or rectal ulcers. Look also for the presence of blood or for alterations of the vascular pattern that might indicate ischemic proctitis.

**Follow-up Evaluation**

A complete history and physical examination conducted by a physician, nurse practitioner, or physician’s assistant is necessary for the initial diagnosis of constipation. However, ongoing assessment also is necessary to monitor the effect of treatment. For this purpose, the Constipation Assessment Scale (CAS) was developed. It is an easy-to-read, eight-item, self-report tool that is clinically useful in a variety of settings.14,17 The CAS is valid and reliable, and it takes approximately two minutes to complete.6 The eight items focus on the symptoms of constipation that are most universal (Table 1). The patient is asked to rate each symptom as “no problem” (0), “some problem” (1), or “severe problem” (2). Item scores are added together for a total that may range from 0 (no constipation) to 16 (worst possible constipation). Readability is at approximately the sixth-grade level, so most patients can read and understand the CAS. A series of these CAS assessments completed over a period of days or weeks provides an ongoing standardized assessment of the cancer patient’s constipation.

**Preventing Constipation**

Preventing constipation should be related to the patient’s risk factors. Assessment of these risk factors should place the patient’s risk into one of the three categories described earlier: primary, secondary, or iatrogenically induced constipation.

**Primary Constipation**

If the patient is at risk for primary constipation because of eating habits or lack of exercise or other lifestyle factors, it is useful to attempt lifestyle changes. However, in excessively debilitated or anorectic cancer patients, increasing fiber and exercise may not be feasible alternatives. For patients who are well enough to cooperate, prevention strategies for primary constipation include the following18,19:

- Increased dietary fiber — Fiber holds water in the stool, making it heavier and faster. It also may increase flatus.
- Increased fluid intake — Water has to be available to be absorbed. The thirst mechanism may be diminished in elderly patients, and patients experiencing nausea may be unwilling to drink. However, they must keep up fluid intake because fiber without fluid can become hard and difficult to pass.
- Adequate exercise — The movement of the body helps the bowels to be mobile. Inactivity helps the bowels to stay inactive.
- Adequate time and privacy for toileting — Some patients are just unable to defecate in a public bathroom and will wait until they get home. Likewise, hospitalized patients and residents in nursing homes who need help to toilet may find it difficult to defecate. Holding the stool in the large bowel allows the water to be reabsorbed, which causes the stool to be hard and difficult to pass. Patients should be taught to plan a time for good bowel hygiene.

Karam and Nies20 reported use of a bowel management regimen for the elderly that included all of the required elements: fluids, exercises, fiber, and a regular toileting time. The program was implemented at three levels — mild, moderate, and aggressive.

The mild program included a minimum of 1500 mL of fluid per day, abdominal and pelvic exercises, 1 oz of fiber supplement daily (Table 3), 5 to 15 minutes on the commode after each meal, and ambulation of at least 50 feet twice per day. These same elements were included in the moderate and aggressive programs, but the amount of fiber supplement was increased to 2 oz and 3 oz per day, respectively. As a result of this protocol, laxative use was markedly decreased and spontaneous bowel movements significantly increased. This appears to be an effective prevention protocol in otherwise healthy elderly adults.

**Secondary Constipation**

Secondary constipation may not be as amenable to prevention as primary constipation. Because it is caused by concurrent diseases, there may be little available in the way of prevention.21 The prevention protocol recommended for primary prevention may be effective in some cases, but in others, it may be necessary to treat the underlying disease or begin a constipation treatment program.

**Iatrogenically Induced Constipation**

Unfortunately, much of the treatment given to patients can cause constipation, and polypharmacy is a particular problem among elderly patients.22 For example, one specialist may prescribe a calcium channel blocker and another may prescribe an antidepressant. Then cancer treatments are added, and another specialist may prescribe one of the vinca alkaloids and an opiate for pain. As drugs are added, the risk of constipation mounts.

When patients come into a cancer setting, the nurse may make a list of current medications, but how is that list used? It is important when taking the drug history to look for drugs that may cause constipation. If a patient reports taking one or more of these drugs, a careful assessment for constipation must be conducted. In a few rare cases, it may be possible to substitute a less constipating drug. However, this will not be possible in most cases, and ongoing management of constipation will become necessary. While it may be tempting to withhold opiates to avoid constipation, this leads to impaired quality of life; a better approach is to give the narcotic analgesic to manage the pain.

<table>
<thead>
<tr>
<th>Ingredient*</th>
<th>Amount</th>
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<tbody>
<tr>
<td>All-bran cerea</td>
<td>2 cups</td>
</tr>
<tr>
<td>Applesauce</td>
<td>2 cups</td>
</tr>
<tr>
<td>Prune juice</td>
<td>1 cup</td>
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</tbody>
</table>

* Mix well and refrigerate.
Managing Narcotic-Induced Constipation

The treatment of narcotic-induced constipation should include, to whatever degree possible, the use of prevention strategies to avoid primary constipation. However, this alone will not be sufficient for patients receiving opiate narcotics. Other strategies involve the use of various pharmacologic agents, given both orally and rectally, and enemas. The choice of strategy depends on the underlying cause of the constipation and its severity.

Several types of pharmacologic agents are available for treating constipation, including osmotic laxatives, emollient or lubricant cathartics, bulk cathartics, and stimulant cathartics.\(^{13,16}\)

**Osmotic Laxatives**

Two commonly used osmotic laxatives are the disaccharides and the saline cathartics. Disaccharides exert an osmotic effect because they are not absorbed or metabolized in the small bowel. This increases bulk via fermentation in the bowel. Unfortunately, the disaccharides may have the side effect of cramps, abdominal distention, and flatulence, which can be uncomfortable for the patient. In addition, disaccharides are usually in a liquid form and may not be palatable to patients. Examples are lactulose and sorbitol.\(^{13,16,23}\) Saline cathartics employ osmotic forces to pull fluid into the bowel to increase the weight of the stool and soften it. An example is Milk of Magnesia.\(^{13,16}\)

**Emollient or Lubricant Cathartics**

Emollient or lubricant cathartics soften stools. An example of this is docusate sodium (marketed as Surfak).\(^{13,16}\) Some older patients may have developed a habit of taking mineral oil as a lubricant. Because of its tendency to wash out fat-soluble vitamins, mineral oil may not be the best choice. If the patient persists in using it, he or she should be instructed to avoid taking it at or near mealtimes. Glycerin suppositories also are a type of lubricant.

**Bulk Cathartics**

Bulk cathartics increase mass and soften stools. Several over-the-counter bulk cathartics are available. An example is psyllium,\(^{18}\) marketed as Metamucil.

**Stimulant Cathartics**

Stimulant cathartics promote intestinal motility, which is the action that opiates suppress. These are available for both oral and rectal administration. Examples include the senna-based products such as Senokot and the stimulant bisacodyl marketed as Dulcolax. These can cause some cramping and may be unacceptable to patients for that reason.\(^{13,16}\) This effect may be diminished by spreading the dose out over the day, perhaps giving small doses with each meal and a slightly larger dose at bedtime. In addition, it should be noted that the cause of the narcotic-induced constipation, the analgesic, also should decrease the impact of cramping in this population of patients, thereby making it somewhat less problematic.

A comparative study of the efficacy of lactulose and senna was conducted using terminal cancer patients (n=91).\(^{24}\) Both laxatives were found to be equally effective in treating narcotic-induced constipation, but senna was recommended because of its lower cost compared with lactulose.

**Prostaglandins/Prokinetic Drugs**

Prostaglandins work by changing water and electrolyte absorption in the intestines. It also is believed that the laxative effect may be due to the motor effect of prostaglandins, but this is not yet clear. Researchers found that misoprostol, marketed as Cytotec, increased the weight and frequency of stools and shortened colonic transit time in patients with severe chronic constipation.\(^{25}\) Cisapride, an agent that stimulates the upper gastrointestinal tract, is useful in patients with spinal cord injury or Parkinson's disease.\(^{21}\)

Colchicine, used to treat gouty arthritis, is useful in treatment of chronic constipation.\(^{26}\) No studies on the effectiveness of these drugs for narcotic-induced constipation have been reported.

**Naloxone**

Orally administered naloxone is an opioid-antagonist that has the ability to antagonize the gastrointestinal effects of opioids. For this reason, it has been studied as a treatment for opioid-induced constipation. In low and slowly escalating doses, naloxone has been shown to have a laxative effect. However, adverse reactions including withdrawal and return of pain have been demonstrated at varying dose levels. Thus naloxone is not recommended for routine use and its use should be avoided in outpatients.\(^{27,30}\)

**Combination Agents**

Some of these pharmacologic agents are available in combinations. For example, senna, a stimulant, is combined with docusate sodium, a stool softener, and sold as Senokot-S. This particular combination is recommended for narcotic-induced constipation because it helps to overcome the specific problems caused by narcotics. Because opiates are known to decrease longitudinal propulsive contractions that help to move stool downward and because they also allow stool to remain in the colon where it dries out and becomes hard, this combination seems ideal. The mechanism of action of senna is stimulation of longitudinal peristalsis (the action that opiates interfere with), and docusate sodium helps to soften stools that have become dry and hard.\(^{16}\)

The effect of opiates on bowel function is so consistent that some experts recommend administering senna and docusate sodium on a scheduled basis rather than when necessary.\(^{30}\) An individualized program that includes careful follow-up evaluation should be developed for each patient.

**Enemas**

Although both nurses and patients dislike them, enemas sometimes are unavoidable. If the patient is impacted, an enema may be the only way to break up hardened fecal matter and wash it out. However, once the impaction has been removed, enemas should be used sparingly. They tend to wash out the normal mucus in the colon that provides lubrication for stools. Therefore, enemas should be considered an extreme measure rather than part of routine treatment.\(^{13,16}\)

**Conclusions**

Constipation is common in patients with cancer because of their many risk factors, and in a cancer patient receiving opiates, constipation is almost guaranteed. Unfortunately, this potentially serious problem is often overlooked and undermanaged. Although constipation may seem like a minor complication when compared to a life-threatening disease such as cancer, it can become a major detriment to quality of life if it is not well managed.

**References**


