

Adjusting Bowel Regimens When Prescribing Opioids in Women Receiving Palliative Care in the Acute Care Setting

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Abstract

In palliative medicine, constipation is the third most common symptom after pain and anorexia, causing some patients to discontinue opioid therapy. Women experience higher incidence of constipation than men. The prevalence of infrequent bowel movements (<3 times/wk) and adherence to an established bowel regimen among women receiving opioids were studied. Referral to the palliative care team decreased the prevalence of infrequent bowel movements from 72% to 45%, and algorithm adherence increased from 38% to 78%. Education of oncology nurses decreased the prevalence of infrequent bowel movements among patients with cancer from 71% to 60%, and algorithm adherence increased from 0% to 10%. Patients benefit from stool softeners and stimulants when receiving opioids.

Keywords

opioid-induced bowel dysfunction, palliative care, bowel regimen, women, acute care

Purpose

Based on Clinical Practice Guidelines,¹ patients receiving opioids for pain should be taking both stool softeners and stimulants to prevent constipation. These should be prescribed in conjunction with opioid pain relievers. In the absence of the recommended prescriptions, staff nurses can advocate for their patients by obtaining bowel regimen orders that follow practice guidelines. This article describes a change project utilizing the Predisposing, Reinforcing and Enabling Constructs in Educational Diagnosis and Evaluation-Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development (PRECEDE-PROCEED) Model² to increase the prescription of a daily bowel regimen and the frequency of bowel movements among hospitalized women receiving opioid pain management in a large hospital in the southwestern United States. Implications for planned behavior change in the acute care setting are also described.

Problem Statement

Pain is the most prevalent symptom among patients receiving palliative care,³ and compassionate care requires attention to the gastrointestinal effects of opioids used in pain management.⁴ Opioid prescriptions provide relief of pain but their

effectiveness is frequently diminished by the occurrence of constipation and other common gastrointestinal side effects. Concurrent prescription of both stool softeners and stimulants can minimize constipation.⁵ Otherwise, opioid binding occurs in the κ , δ , and μ receptors in the enteric nervous system and constipation, nausea, and vomiting result.⁶ Adult patients with cancer have opioid-induced constipation rates of 40% to 63%, with women experiencing more frequent constipation than men.⁷ Inpatient opioid-induced constipation was reported at 63% in a large cancer center in the southeastern United States.⁸

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Specific problems in pain management occur with the elderly patients. Practitioners may consider constipation an unavoidable and relatively minor side effect of narcotic administration for palliative care of elders. Unfortunately, opioid-induced constipation is a significant source of patient discomfort. Patients have discontinued opioid therapy because of constipation,⁹ often dying in pain.¹⁰ Constipation is the most common adverse effect of opioid use in elders.¹¹

Constipation is a costly problem. In one Swedish study, the estimated cost of constipation management due to opioids was US\$1531 to US\$1952 per month.¹² In the United States, acute care hospital admissions for constipation significantly increased ($P < .001$) from 1997 to 2010, and total constipation-related hospital costs increased from US\$188 million to US\$851 million, with the elderly patients accounting for a large percentage of discharges.¹³

There is no agreement on specific drugs to be used to relieve constipation due to opioids. Authors of 2 Cochrane Reports^{14,15} reviewed 165 trials of constipation interventions in palliative care patients and reported low levels of evidence and persistent uncertainty about which drugs best manage constipation. Based on a comprehensive review of the available evidence, the American Society of Interventional Pain Physicians recommended a bowel regimen be initiated when using opiates.¹⁶

In addition to a lack of consensus, practitioners' lack of knowledge about constipation and its management remains a critical barrier to reducing pain and improving quality of life in the palliative care. Inpatient hospital care generally focuses on achieving cure of disease, which may overshadow concerns about constipation. Practitioner knowledge about constipation is lacking.¹⁷ When opioids are prescribed, usual care is to prescribe either a stool softener or a bowel stimulant though not both. In addition, when these prescriptions are written, they are frequently ordered "as needed" rather than on a daily basis,¹⁸ which may not prevent constipation.⁸

This project was a collaborative effort between a southwestern university and a hospital within a large health care system to reduce pain and constipation.¹⁹ Two separate interventional studies were implemented involving the palliative care team and the inpatient oncology nurses within the structure of a behavior change planning model. In both interventions, the prevalence of bowel regimen prescriptive practices and the frequency of bowel movements in female patients were examined. The desired compassion-based behavior change was to advocate for the use of a daily stool softener and stimulant when opioids were prescribed.

Literature Review

Concerned about the prevalence of constipation, a pan European working group of physicians and nurses with significant experience in the management of constipation in palliative care¹ evaluated published evidence and proposed an algorithm to standardize prevention and management of constipation. The proposed pain medication, stool softener, and stimulant triad algorithm was expected to decrease opioid-induced bowel

dysfunction. The intent was to suggest a working algorithm until a definitive treatment could be recommended. In the United States, national guidelines were disseminated for treatment of constipation with opioid use in palliative care²⁰ that include the prescription of laxatives as soon as patients start opioid therapy.

While widely prescribed, a stool softener alone is not recommended as the sole treatment for constipation.^{18,21} Colonic motility is halted with opioid use, rendering stool softeners alone ineffective in addressing the resulting constipation. Instead, when opioids are prescribed, treatment should be augmented with the use of both stool softener and stimulants.⁷ Multiple barriers to the use of evidence-based practices have been reported.²² These include insufficient time, lack of staff, and lack of necessary equipment and supplies.²⁰

Conceptual/Theoretical Approach and Design

These studies employed the PRECEDE-PROCEED Model,² a methodology to design, implement, and evaluate interventions that influence health-related behaviors. The model includes the following 8 steps to direct planning and implementation of health behavior changes: (1) social assessment and situational analysis, (2) epidemiological assessment, (3) educational and ecological assessment, (4) intervention alignment, (5) implementation, (6) process evaluation, (7) impact evaluation, and (8) outcome evaluation. This 8-step behavior change model is expected to be fully integrated in the hospital setting over time and will serve as a model for other evidence-based initiatives.

Social assessment and situational analysis involved a review of palliative care literature identifying constipation as a significant health issue.²³ Social assessment begins by asking the community what it wants and needs to improve its quality of life. Both palliative care team members and the oncology Registered Nurse (RN) clinical leader, speaking on behalf of oncology staff nurses, indicated a desire to reduce constipation among their patients.

In epidemiological assessments, the prevalence of infrequent bowel movements and algorithm adherence among female inpatients were determined. In the palliative care team study, epidemiologic assessment was conducted before and after patients were referred to the palliative care team. This provided a comparison of the effect of the algorithm adjusting the bowel regimen. Palliative care teams have been reported to be effective in managing pain and opioid-induced constipation.⁵ The award-winning interprofessional palliative care team at this southwestern hospital has worked together for 7 years. In the oncology nurses study, assessment was conducted on the 22-bed oncology unit before and after oncology staff nurse education regarding the algorithm. In selecting these 2 groups for study, researchers were seeking opinion leaders to lead a hospital-wide behavior change to reduce opioid-induced constipation.

The epidemiologic assessments involved review of patient medical records. Direct queries of records are more comprehensive than self-report to ascertain how health team members

perform and to identify differences, if any, from the recommendations/guidelines and nursing competencies.²⁴

During the educational and ecological assessment, information on the triad algorithm was provided to palliative care team members and oncology staff nurses. In the palliative care study, a copy of the publication about the algorithm was provided to palliative care team members who were already somewhat familiar with it. Team members believed that they followed this algorithm routinely in consultations except with patients of attending physicians who preferred to manage their own patients' bowel regimens. In the oncology nurse study, staff education was provided using the hospital's usual method of mandatory continuing education. A voice-over PowerPoint presentation explaining the algorithm to prevent constipation in patients receiving opioid therapy was provided online and was viewed at the convenience of staff nurses during a 1-month period. Staff nurses have preferences regarding effective educational strategies.²⁵ In a study of 166 nurses, didactic methodology of a 20- to 40-minute slide presentation self-learning module was evaluated as useful.²⁶

The design for both studies included a baseline measure of prevalence of infrequent bowel movement and adherence to the algorithm. For the palliative care team study, prevalence and adherence were measured prior to and after the consultation with the palliative care team. For the oncology nurses study, prevalence and adherence were measured prior to and following the educational intervention.

Method

Both studies were approved by the hospital's institutional review board.

Participant Selection

The palliative care team study involved records of women 25 years of age or older referred to the palliative care team who were receiving opioid pain medications. Participant selection was reduced from age 60 to achieve the targeted sample size. The prescribing members of the palliative care team were study participants in the study of algorithm adherence.

The oncology nurses study involved records of women aged 60 years or older admitted to the hospital's oncology unit and receiving opioid pain medication. All 33 nurses working on the inpatient oncology unit participated in the study of algorithm adherence.

Sampling Plan and Patient Samples

A list of all patients referred for care to the palliative care team over 7 consecutive months was acquired. Sixty-four patients were included. Similarly, a list of patients admitted to the oncology unit was reviewed for patients who met study criteria. One hundred and three inpatients were included.

Data Collection

Palliative care team study data were collected from June through December 2013. The following data were abstracted from the patient electronic medical records (EMRs) on the data collection tool: age; dates of hospital stay; unit; bowel movements by date experienced; receipt of stool softener, stimulant, or a combination of both; and name of opioid medication regularly scheduled and taken at least daily. A defecation day was defined as having at least 1 bowel movement that day. The number of defecation days was collected for the time period prior to the palliative care team consultation and for the period following consultation. Infrequent bowel movements (<3 times/wk) were defined as undesirable. If the period was less than 7 days, constipation was defined as less than 3 of 7, when the formula of defecation days divided by total days was applied. Definitions of opioids, softener, stimulant, and combination were listed on each data collection sheet. Data on the prescription of daily stool softener and stimulant were collected for the time period prior to the palliative care team consultation and for the period following consultation.

Oncology nurses study data were collected from April through August 2014—at baseline, the month that the nurses were viewing the educational module, and for 3 months following the educational intervention. Patient data were collected from the EMRs using the data collection tool.

In both studies, each medical record reviewed was assigned an identification code. A separate log linking the name or medical record number and identification code was maintained and accessed only by the principal investigator or coinvestigator. The principal investigator or a coinvestigator with research ethics education abstracted data from the EMRs using the same data collection instrument.

Data Analysis

Descriptive statistics were used to summarize infrequent bowel movement prevalence and guideline adherence. All statistical analyses were conducted using the SPSS v.22. The level of significance was set at $\alpha = .05$; a 95%.

Palliative care team study. Infrequent bowel movement was analyzed for the period from admission to the palliative consultation and for the period following consultation to discharge. Algorithm adherence was present when daily orders existed for both stool softener and stimulant. Investigators calculated the aggregate proportion (percentage) of patients who received the algorithm for the period before and after palliative care consultation. The McNemar test was used to analyze data using infrequent bowel movement and percentage of algorithm adherence prior to consultation and following consultation.

Oncology nurses study. Infrequent bowel movement and algorithm adherence were analyzed for 5 months. Algorithm adherence was measured as daily orders written for stool softener and stimulant. Investigators calculated the aggregate proportion (percentage) of patients who received the complete

Table 1. Race/Ethnicity of the Patients Reviewed.

Demographic variable	N (%)
Palliative care team study (n = 64)	
Race	
Asian or Pacific Islander	2 (3.1)
Black or African American	1 (1.6)
Native American/American Indian	1 (1.6)
White or caucasian	60 (93.8)
Ethnicity	
Hispanic	5 (10.1)
Non-Hispanic	59 (92.2)
Oncology nurses study (n = 103)	
Race	
Asian or Pacific Islander	7 (6.8)
Black or African American	1 (1.0)
Native American/American Indian	0 (0.0)
White or caucasian	95 (92.2)
Ethnicity	
Hispanic	22 (21.4)
Non-Hispanic	81 (78.6)

algorithm of daily orders for stool softeners and stimulants. A 2×2 chi-square (χ^2) test of independence was used to determine significance.

Findings

Palliative care team study. The palliative care team study involved 64 patients, with an age range of 27 to 95 years and a mean age of 63.6 years (standard deviation [SD] = 16.00 years). Patients were predominantly non-Hispanic caucasians (Table 1). The palliative care team was comprised of a social worker and prescribing members that included 2 board-certified physicians in Internal Medicine, Hospice and Palliative Medicine, 3 family nurse practitioners (2 board certified and 1 with advanced certification in palliative medicine). Defecation days ranged from 0% to 100% of total days during the period observed. Prevalence of women with infrequent bowel movements was 71.9% prior to the consultation. Following the consultation, prevalence was 45.7%. There was a significant decrease in infrequent bowel movements ($\chi^2 = 9.481$, $P = .002$). Adherence to the algorithm occurred in 37.5% (n = 24) of patients prior to palliative care consultation and 78.1% (n = 50) after. This was a significant increase ($\chi^2 = -4.725$, $P < .001$).

The impact of referral on patient care was calculated as adjustments to the bowel regimen by the palliative care team. To adhere to the algorithm, the palliative care team adjusted the bowel regimen of the prior attending medical doctor prescriptions in 39.1% (n = 25) of patients. No adjustments to the bowel regimen were made for 37.5% (n = 24) as they were already following the algorithm. Adjustments made by the palliative care team are delineated in Table 2.

Oncology nurses study. This study involved 103 patients, with an age range of 60 to 95 years and a mean age of 72.0 years (SD = 8.6 years). Patients were predominantly non-Hispanic

Table 2. Palliative Care Team's (PCT) Adjustments to the Patient's Bowel Regimens.

Bowel regimen adjustments	N (%)
To the prior attending Medical Doctor (MD) prescriptions	
None—attending MD already prescribed stool softener and stimulant	24 (37.5)
Added a stool stimulant daily to an already prescribed softener	3 (4.7)
Added a stool softener daily to already prescribed stimulant	4 (6.3)
Added a stool softener and a stimulant daily	18 (28.1)
To the palliative care team member's prescriptions	
None—PCT did not follow algorithm	11 (17.2)
Added a stool stimulant daily though no softener	2 (3.1)
Added a stool softener daily though no stimulant	2 (3.1)

Table 3. Oncology Nurses Study: Frequency of Patients With Infrequent Bowel Movements by Month.

Month	n	Frequency (%)
April 2014	21	15 (71.4)
May 2014	20	12 (60)
June 2014	20	12 (60)
July 2014	20	18 (90)
August 2014	22	7 (31.8)

Table 4. Oncology Nurses Study: Frequency of Patients Prescribed Daily Pain Medication, Stool Softener, and Stimulant by Month.

Month	n	Frequency (%)
April 2014	21	0 (0)
May 2014	20	1 (5)
June 2014	20	4 (20)
July 2014	20	1 (5)
August 2014	22	1 (4.5)

caucasians (Table 1). Thirty-three nurses participated. Their level of education was as follows: 60.6% baccalaureate (n = 20) and 39.3% associate degree (n = 13). Years of experience in oncology varied: more than 10 years 57.6% (n = 19), 6 to 10 years 21.2% (n = 7), 2 to 5 years 12.1% (n = 4), and less than 2 years 9.1% (n = 3). Prevalence of women with infrequent bowel movements was 71.4%; postintervention, prevalence was 59.7%. Infrequent bowel movements by month are displayed in Table 3. The prevalence of women with infrequent bowel movements was not significantly reduced by the education ($\chi^2 = .93$, $df = 1$, $P = .336$). Adherence to the algorithm occurred in 0% of patients during the preintervention period (n = 21) and 9.7% (6 of 62) following intervention. This increase in algorithm adherence was not statistically significant ($\chi^2 = 2.19$, $df = 1$, $P = .139$). Data on patients prescribed pain medications, stool softeners, and stimulants by month are provided in Table 4.

Discussion of the Findings

In the palliative care team study, there was a significantly decreased prevalence of infrequent bowel movements in patients and a significantly increased adherence to the triad algorithm. However, no significant change was found in the prevalence of infrequent bowel movements among women inpatients receiving opiates both before and after an educational intervention aimed at oncology nursing staff. Prevalence rates among patients remained at the high end of normal (40%-63% as reported in the literature).¹⁰ Extremely poor adherence to the triad algorithm was documented both before and after the education. Barriers to algorithm adherence reported by the oncology nurses were lack of doctors' orders, the need for patients to be taught about opioids and bowel function, and the need for further nurse education about the combination use of stool softeners and stimulants with opioid pain medication. Nurses reported that patients occasionally refused bowel regimens, when available, stating that they feared too-frequent bowel movements or the sensation of evacuation urgency.

Limitations of the Studies

Comparing the findings of the 2 studies is difficult. Patient age ranges for participant selection varied. An analysis of palliative care team performance using only cases in the 60 to 95 age range was performed ($n = 39$). Findings were similar to those for the wider age range. Constipation was reduced (74.4%-35.9%, $P = .001$) and algorithm adherence was increased (41%-84.6%, $P = .001$) following consultation. Scope of adjustment to bowel regimens differed between the 2 studies. The palliative care team adjusts bowel regimens directly. The oncology nurses serve as indirect advocates for adjustments in bowel regimen orders. Direct authority for adjustments lies with other providers.

The breadth of the design could be enlarged to include the full constellation of symptoms that make up the diagnosis of constipation (eg, straining, passing of hard stools, sensation of incomplete evacuation, sensation of anal blockage, and use of manual maneuvers). One institution was used for the studies. As this institution is part of a large health system, there may be opportunities to expand sample size and vary the location.

Implications for Practice

This work has provided foundational knowledge for a more extensive behavior change approach. Findings demonstrate the excellent practice of the palliative care team in symptom management related to bowel movements of patients receiving opiates. Next steps include improving adherence to the algorithm in the inpatient population with cancer. A priority step is systematically obtaining oncology nurses' input on barriers and facilitators to algorithm use and involving other members in the health care experience. Clinical nurse leaders can engage other team members by presenting research findings to medical, pharmacy, and information systems committees. A patient



Figure 1. Artistic rendering of no pain no strain.

education resource book on managing the frequency of bowel movements could be developed and disseminated in admission packets that would be useful to the patient and the home caregiver. Charge nurses can request adjustments to the bowel regimen orders of attending physicians as appropriate. Future steps include a detailed implementation plan that includes permanent and sustainable changes such as preventing the ordering of opioids without a prompt for the bowel regimen. Posters and other depictions of correct practices could heighten awareness of health team members, patients, and home caregivers. The theme for future education materials could emphasize a “no pain no strain” media campaign (Figure 1). Process evaluation benchmarks could be assessed based on algorithm adherence. Impact evaluation could involve measuring the extent of changes in infrequent bowel movements hospital wide. Outcome evaluation could determine the effect of the change on outcomes such as compassionate care, length of stay, readmission, and frequency of emergency room visits for bowel-related reasons.²⁷ If successful, widespread change strategies can be implemented across the health care system to which this hospital belongs.

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