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## Prevalence of Constipation Symptoms in Fecally Incontinent Nursing Home Residents

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### Abstract

**OBJECTIVES**—To determine the prevalence of constipation symptoms and the effects of a brief toileting assistance trial on constipation in a sample of fecally incontinent nursing home (NH) residents.

**DESIGN**—Observational study.

**SETTING**—Five NHs.

**PARTICIPANTS**—One hundred eleven fecally incontinent NH residents.

**MEASURES**—Research staff measured bowel movement frequency every 2 hours for 10 days. The following week, residents were offered toileting assistance every 2 hours for 2 days to determine resident straining, time required for a bowel movement, and resident perceptions of feeling empty after a bowel movement. Constipation data were abstracted from the medical record.

**RESULTS**—The frequency of bowel movements during usual NH care was low (mean = 0.32 per person per day), and most episodes were incontinent. The frequency of bowel movements increased significantly, to 0.82 per person per day, and most episodes were continent during the 2 days that research staff provided toileting assistance. Eleven percent of residents showed evidence

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of straining, and 21% of the time after a continent bowel movement, residents reported not feeling empty. Five percent of participants had medical record or Minimum Data Set documentation indicative of constipation symptoms.

**CONCLUSION**—Low rates of bowel movements during the day that are potentially indicative of constipation were immediately improved during a 2-day trial of toileting assistance in approximately 68% of the residents, although other symptoms of constipation remained in a subset of residents who increased toileting frequency.

## Keywords

Constipation; fecal incontinence; nursing home

Fecal incontinence is common in nursing home (NH) residents, and many of these residents receive laxatives or stool softeners, presumably for constipation, which may exacerbate the incontinence.<sup>1</sup> The association between fecal incontinence and constipation could occur by two mechanisms. First, constipation may predispose people to fecal impaction, which in turn can lead to incontinence. A second mechanism is that the use of stool softeners and laxatives may predispose residents to fecal incontinence if they have low bowel closure pressures. Unfortunately, there are sparse data describing the prevalence or severity of constipation symptoms in the general NH resident population or residents with fecal incontinence, although there is indirect evidence to suggest that the problem is prevalent.

If one accepts treatments for constipation as a valid indicator of constipation, then the problem affects the majority of NH residents. In one study, 93% of residents in two NHs had medical record documentation for a stimulant or laxative at least twice in the previous 4 weeks,<sup>2</sup> although this same sample of residents also had medical record documentation of approximately one bowel movement per person per day. This rate of a daily bowel movement reflects the effectiveness of the constipation treatments or inaccurate medical record data. Recent studies that have shown that medical record documentation for NH residents is often inaccurate in many care domains including areas related to constipation, such as incontinence frequency and physical activity.<sup>3</sup> There are no published data about the accuracy of NH staff daily reports of residents' bowel movements or Minimum Data Set (MDS) ratings of constipation in residents' medical records.

There is strong evidence from two studies that the daily frequency of bowel movements for a sample of NH residents with fecal incontinence is suggestive of constipation if data independent of the medical record are collected.<sup>4,5</sup> In these studies, research staff checked for fecal incontinence every 2 hours. Results showed that the frequency of bowel movements was 0.24 to 0.60 per person per day. This low frequency would qualify many residents as having constipation, unless there was a high frequency of bowel movements at night, which is unlikely.

There are sparse data about the prevalence of constipation symptoms in NH residents who suffer from fecal incontinence other than daily bowel movement frequency reported in these two studies.<sup>4,5</sup> Other symptoms that define constipation beyond bowel movement frequency include evidence of straining or difficulty emptying and the consistency of stool. One study used patient self-recorded data (a diary) that indicated that more than 50% of institutionalized patients reported straining during more than 25% of bowel movement episodes.<sup>6</sup> Patient characteristics were not reported in this study. Based on the dearth of information in the published literature, the purpose of this descriptive study was to address the following research questions.

1. What is the prevalence of constipation symptoms in NH residents who suffer from fecal incontinence when symptoms are measured using standardized protocols independent of the medical record?
2. How does constipation symptom data collected by research staffs compare with constipation data documented in the NH medical record?

## METHODS

### Setting and Recruitment

Participants in this study were part of a larger on-going randomized controlled trial to evaluate a behavioral intervention to improve fecal incontinence in NH residents. Participants were recruited in 2006 to 2008 from five NHs, two of which were nonprofit, in California and Tennessee. The five NHs ranged in size from 119 to 240 beds (mean occupancy rate = 84%), and the total resident population across the five NHs at the time of the study was 671. Table 1 illustrates how these residents were recruited. Of the total resident population, 448 residents (66.8%) met inclusion criteria for the larger trial, which required residents to have urinary and fecal incontinence or fecal incontinence alone based initially on NH staff report and then confirmed during baseline assessments. Potential participants were further excluded from the larger trial if they were on Medicare reimbursement (short-stay or rehabilitation), receiving end-of-life (hospice) care, or unable to follow a one-step command based on a standardized screening conducted by trained research staff. A total of 321 residents (47.8%) met inclusion criteria. Residents were manually checked for fecal impaction but not excluded if they were found to be impacted. Nursing staff were informed of the impaction if present and asked to treat the resident.

Two university-affiliated institutional review boards (one in each state) approved consent procedures. Written consent was obtained from the resident or the resident's designated responsible party for 136 of the 321 (42.4%) eligible residents. After consent, 25 residents were lost from the study because of consent withdrawal ( $n = 14$ ), death ( $n = 9$ ), or prolonged hospitalization ( $n = 2$ ). Data were collected for the remaining 111 (81.6%) participants. All data reported in this study were collected during baseline before the clinical intervention trial.

### Measures

**Medical Record and MDS Data**—Research staff retrieved demographic and medical (e.g., diagnoses, medications) information for each participant from their medical record using a standardized form (Table 2). Medications were reviewed for scheduled or prescribed as needed (PRN) orders for laxatives and stool softeners, as well as medications with constipation side effects. In addition, the most recent MDS, quarterly or full annual assessment (Section H. Bowel Elimination Pattern item 2b: Constipation present/absent, and Section G. Physical Functioning items 1b: Transfer ability) was retrieved for each participant. Finally, nurse aide flow sheets listing the frequency of bowel movements during each shift for 24 hours were available in two of the five NHs, so these data were retrieved for the same 10-day period during which research staff conducted incontinence checks (see Physical Checks for Incontinence) for participants in these two sites ( $n = 41$ ). Research staff administered a standardized performance-based assessment of cognitive status, the Mini-Mental State Examination (MMSE), with a score range from 0 (severely cognitively impaired) to 30 (cognitively intact).<sup>7</sup>

**Physical Checks for Incontinence**—Trained research staff performed physical checks of each participant every 2 hours between 7 a.m. and 3 p.m. for 10 week days for 2 consecutive weeks (4 checks per day  $\times$  10 days = 40 total possible checks per person).

During each check, research staff thoroughly checked the participant's incontinence absorbent products, undergarments, and clothes for evidence of incontinence (e.g., wetness or fecal matter). Research staff provided incontinence care (changing of soiled garments or absorbent product), when needed but only provided toileting assistance when the participant requested it during this 10-day period. Nursing home staff were asked to report any episodes of changing or toileting that they provided between the 2-hour research staff checks. Research staff also monitored the hallways outside of residents' rooms between checks to capture episodes of incontinence care or toileting assistance provided by NH staff between checks.

Before baseline assessments, research staff received training in how to reliably conduct the incontinence checks until interrater reliability reached a level of 0.90 agreement or better. Thereafter, the reliability of research staff data collection was monitored each week, and an on-site supervisor conducted periodic reliability checks. The protocol used to assess incontinence in this study has been used in previous studies of incontinence in NH residents.<sup>8</sup> The purpose of the 10-day assessment period in this study was to determine the daily frequency of bowel movements under usual NH care conditions, when there is typically not a concerted effort to encourage residents to use the toilet multiple times per day. Bowel frequency was monitored for 10 days, because a power analysis indicated that this baseline period was necessary to detect intervention effects on fecal incontinence frequency outcomes in the larger trial, but this 10-day period also provided the opportunity to estimate bowel movement frequency over the shorter 7-day periods used as a frequency criterion to define constipation.<sup>9</sup> However, research staff estimated bowel frequency only during the 40 physical checks across the 10 days when they checked residents between 7 a.m. and 3 p.m. Research staff did not directly measure bowel frequency during other time periods, and NH staff records were not available or not used for these other time periods even if available because of concerns about accuracy. The reason for these accuracy concerns will be described in the "Results" section. The 7 a.m. to 3 p.m. shift was the only period that the labor-intensive incontinence checks were conducted because of resource limitations.

**Two-Day Toileting Assessment**—Previous studies have shown that residents rarely request toileting assistance during incontinence checks, and NH staff does not routinely offer toileting assistance to most residents under usual care conditions.<sup>4,5</sup> Research staff conducted a 2-day toileting assessment to provide participants with an opportunity to toilet so that constipation symptoms could be assessed during continent bowel movements. During the 2-day toileting assessment, trained research staff checked each participant for incontinence, as described above, between 7 a.m. and 3 p.m. In addition to the incontinence checks, research staff also prompted residents to use the toilet during each check. The prompted-voiding protocol used in this study has been used extensively in previous incontinence research studies.<sup>8</sup> The resident's rate of appropriate toileting during the 2-day assessment (total number of continent episodes/total number of continent+incontinent episodes) has been shown to be predictive of residents' ability to maintain a higher level of urinary continence over time.<sup>8</sup> Comparisons between the incontinence and toileting measures for the 10-day baseline and 2 days of prompted voiding for 111 patients that completed both conditions were accomplished by transforming the measures into a percentage (percentage appropriate toileting) or average per-day statistics (frequency of bowel movements per resident per day) that could be analyzed using *T*-tests for paired samples.

For the purposes of this study, the following information was recorded during the 2-day toileting assessment: frequency of toileting attempts (number of times per person per day the resident agreed to sit on the toilet); total bowel movement frequency, including continent (toilet or bed pan) and incontinent (soiled garments, absorbent products, or linens other than

streaking- or staining-only episodes); total time required for the toileting episode (from the time the resident was placed on the toilet until she or he was assisted off the toilet); percentage of time a resident strained during toileting; and percentage of time a resident reported not feeling empty after a bowel movement. Straining was defined according to research staff observations during toileting attempts of the following resident behaviors: pushing, holding breath or being out of breath, clenching hands or teeth, grunting, repositioning self, or abdominal thrusts. After a continent bowel movement, each participant was asked, "Do you feel empty?" Possible responses were: yes, no, don't know, or no response/refused to respond.

In addition to behavioral evidence of straining and the resident's self-report of whether he or she felt empty after a continent bowel movement, research staff also observed and rated stool consistency based on the standardized 7-point Bristol Stool Scale.<sup>10</sup> A rating of "1" on this scale is defined as small hard pellets, which reflect a longer bowel transit time and a rating of "7" is liquid stool (diarrhea or overflow). As done with the incontinence check procedure, research staff received training in the toileting assessment protocol until interrater reliability met or exceeded 90% agreement for all of the above measures.

## RESULTS

### Subjects

Table 2 shows the demographic and medical characteristics of the 111 participants. Participants had an average age of  $86.0 \pm 9.4$  and an average length of NH residency of 39.5 months (median = 39.2). Participants were moderately cognitively impaired, as evidenced by an average MMSE total score of  $11.3 \pm 8.9$ . NH staff reported that 60% of the participants required extensive or total assistance for transfer. The characteristics of participants in this study were similar to the characteristics of incontinent NH residents in previous studies.<sup>4,5</sup>

NH staff did not rate most residents (94.6%) as having constipation based on their most recent MDS assessment, nor was there information in daily nurse notes about constipation, although almost 59.6% had an order for a scheduled laxative, and 29.4% had an order for scheduled stool softeners. Only 33.0% of the participants had neither a laxative nor stool softener order.

There were also scheduled and PRN orders for suppositories for two and three residents, respectively. Bowel stimulants that were not PRN were administered daily in the morning (39.1%), in the morning and evening (46.4%), or in the evening only (14.5%). As a result, the number of residents who received at least one of these medications during the 10-day baseline and 2-day toileting trial was not different (75 and 73 residents, respectively). The majority (94.6%) had an order for at least one scheduled medication with constipation as a side effect. The average number of medications with constipation side effects per resident was  $2.7 \pm 1.5$ . The most common routine medications with constipation as a side effect were memantine, sertraline, clopidogrel, and metoprolol.

Table 3 shows the frequency of bowel movements for the group of participants based on the 10-day incontinence checks and the 2-day toileting assessment. The average total number of bowel movements during the 10-day incontinence checks was 0.32 per person per day. Eighty-one percent of the participants had a total frequency of bowel movements of less than three in a 7-day period, which suggests potential constipation even though accurate bowel frequency data for time periods other than 7 a.m. to 3 p.m. were not available. Participants rarely requested toileting assistance during the 10-day assessment (2.5 times

average per subject over the 10 days or 0.25 per resident per day, with mode of 0), and only 29% of the baseline bowel movements were continent episodes (toilet or bedpan).

Nurse aide flow sheets retrieved during the same 10-day period in one of the participating NHs indicated that aides recorded an average of  $0.7 \pm 0.7$  bowel movements per resident per day for the participants in this site ( $n = 19$ ), with approximately half of these occurring during the day shift (7 a.m.–3 p.m.), when research staff also were present. The difference between the frequency of bowel movements recorded by research and NH staff during the same shift when both were present was 0.5 bowel movements per person per day, with the NH reporting a significantly higher frequency. These differences were assessed using *T* tests for independent samples ( $t = 5.9$ ,  $P < .001$ , degrees of freedom ( $df$ ) = 18), although in the second NH site, where nurse aide flow sheet data related to bowel movement frequency were available, research and NH staff data were comparable for the day shift hours (0.34 vs 0.36 bowel movements per person per day ( $n = 17$ )).

Bowel movement frequency increased significantly ( $t = 4.5$ ,  $P < .001$ ), from  $0.32 \pm 0.30$  to  $0.82 \pm 0.99$  per person per day during the 2-day toileting assessment when research staff provided toileting assistance every 2 hours, or four times daily. There was also a significant increase in the percentage of continent bowel movements, from  $29.3 \pm 0.37\%$  to  $74.6 \pm 0.35\%$  ( $t = 7.8$ ,  $P < .001$ ), although 32% of the participants did not respond to the toileting assistance and did not have any bowel movement (continent or incontinent) documented by research staff during the 2-day toileting assessment period.

Despite the greater frequency of total and continent bowel movements during the 2-day toileting assessment period, constipation symptoms remained evident. Twelve participants (10.8%) were observed by research staff or self-reported straining. Research staff asked “Do you feel empty?” after each continent episode ( $n = 126$ ). Of the total episodes, 35.7% of the time, the subject was unable or unwilling to respond to this question. Of the remaining 81 episodes, 21% ( $n = 17$ ) of the residents responded “no” to this question. The average amount of time required by the participants to have a continent bowel movement was  $7.2 \pm 3.3$  minutes per person per episode. The average research staff stool consistency rating for participants who had a continent bowel movement was  $4.2 \pm 1.5$ , which indicates neither liquid stool (rating 7) nor hard stool (rating 1).

## DISCUSSION

The frequency of bowel movements during usual care NH conditions was 0.32 per resident per day (largely caused by low frequencies of staff assistance for toileting) because the frequency significantly increased (0.82 per day) when residents were assisted. However, there was evidence of constipation problems other than frequency even during this 2-day trial when toileting assistance was consistently offered. Thirty-two percent of the residents had no bowel movements as documented by research staff during this 2-day period, which suggests a continuation of constipation problems despite efforts to provide toileting assistance and the high rate of laxative use (65% of residents). In addition, 11% of the residents were observed straining during toileting attempts, and 21% reported not feeling empty after defecation. These symptoms, particularly laxative use, appear to be higher than normative data reported for the general population. The largest normative study (telephone survey of 10,018 people) reported a constipation symptom prevalence of 14.7% (all symptoms considered), with only 1.8% of the community population reporting laxative use every other day.<sup>11</sup>

NH caregivers appear to be largely underdetecting the constipation symptoms reported by many residents, even when the residents are receiving bowel stimulants. The MDS listed



5.4% of these residents as suffering from constipation, and the daily records in one of the NHs significantly overestimated the frequency of bowel movements at least during the day shift. The fact that constipation symptoms are frequently not noted in NH records probably reflects the overestimate of documentation of daily bowel movement frequency in some homes. This low rate of constipation symptom documentation may also reflect a failure to provide toileting assistance to residents, during which time symptoms such as straining can be observed. The fact that the average time for a continent bowel movement was longer than 7 minutes per resident, on average, may also reflect a constipation-related phenomenon and is a partial explanation for why staff may be reluctant to offer toileting assistance.

One limitation of this study is that NH records that reported bowel movement frequency per shift were available in only two homes. The other homes recorded frequency over longer intervals that obscured the specific time periods that the bowel movements were recorded to occur. Having research staff observations of bowel frequency over a 24-hour period can best address this limitation.

The data presented in this paper have several implications. First, it may not be necessary to use bowel stimulants for many NH residents with fecal incontinence, because toileting significantly increased the frequency of fecal voids. Given the unknown effects and expense of long-term laxative or stool softener use, a trial of toileting assistance without use of laxatives is important to conduct. Second, a significant percentage of residents still showed constipation symptoms and low appropriate toileting frequency when using routine laxatives and receiving consistent toileting. This finding suggests that constipation symptoms and fecal incontinence may remain a problem for many residents due to other mechanisms.

It is likely that the large percentage of residents using medications that can exacerbate constipation and physiologically related emptying problems may be the explanation for this finding. The larger intervention trial involving anorectal testing of some residents and the monitoring of fecal frequency over longer time periods may elucidate this physiological mechanism.

In this regard, we have published preliminary data that many residents have impaired function of the internal sphincter (reduced basal tone) and external anal splinter (reduced squeeze amplitude and duration) that may limit the efficacy of more frequent toileting on the frequency of fecal incontinence if residents are also being treated for constipation with bowel stimulants that loosen stool.<sup>12</sup> In addition, many residents also have dyssynergia (increases external sphincter pressure while attempting to void), which can exacerbate constipation even if residents receive bowel stimulants and increase toileting frequency. Finally, two controlled studies have reported that dietary supplements (e.g., fermented cereal or herbal teas) might improve constipation symptoms in NH residents, which suggest a dietary mechanism to constipation not addressed in this study.<sup>13,14</sup>

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**Table 1**

## Recruitment Table

<b>Resident Recruitment</b>	<b>Residents, n</b>
Total resident population	671
Urinary incontinence and fecal incontinence	448
Exclusion: short stay, hospice, other	127
Total eligible	321
Consented	136
Lost to attrition	25
Deaths	9
Consent withdrawn	14
Prolonged hospitalization	2
Total participants	111

**Table 2**

Demographic, Medical, and Nutritional Characteristics of Participants (N = 111)

Characteristic	Value
Demographic	
Female, n (%)	91 (82.0)
White, n (%)	95 (85.6)
Age, mean $\pm$ SD	86.0 $\pm$ 9.4
Length of stay, months, mean $\pm$ SD	39.5 $\pm$ 28.1
Medical	
Physician-recorded diagnosis of dementia, n (%)	84 (75.7)
Mini-Mental State Examination total score, mean $\pm$ SD (range 0–30)	11.3 $\pm$ 8.9
Identified as constipated according to MDS records, n (%)	105 (5.4)
Order for scheduled laxative treatment, n (%)	65 (59.6)
Order for scheduled stool softener, n (%)	32 (29.4)
Order for neither scheduled laxative nor stool softener, n (%)	36 (32.4)
Physician-recorded order for scheduled medication with constipative side effects, n (%)	103 (94.6)
Average number of medications with constipative side effects per resident, mean $\pm$ SD	2.7 $\pm$ 1.5
Physical functioning	
MDS transfer rating $\geq 3$ *	74 (66.6)

\* 0 = independent, 1 = supervision, 2 = limited assistance, 3 = extensive assistance, 4 = totally dependent on staff.

SD = standard deviation; MDS = Minimum Data Set.

**Table 3**

Bowel Movement Frequency and Constipation Symptoms (N = 111)

Measure	Value
10-day baseline incontinence checks	
Frequency of bowel movement per resident, average $\pm$ SD	0.3 $\pm$ 0.3
Percent had less than 3 bowel movement in 5 days	90 (81.1)
Total times resident requested toileting assistance, average $\pm$ SD	2.5 $\pm$ 3.8
Percentage of continent bowel movement, average $\pm$ SD	29 $\pm$ 0.4%
2-day prompted voiding	
Frequency of bowel movement per resident, average $\pm$ SD	0.8 $\pm$ 1.0
Percentage of continent bowel movement, average $\pm$ SD	74 $\pm$ 0.4%
Residents who strained after continent bowel movement, n (%)	12 (10.8)
Times resident reported not feeling empty after continent bowel movement, n (%)	17 (20.9)
Time on toilet, minutes, average $\pm$ SD	7.2 $\pm$ 3.3
Stool consistency rating, average $\pm$ SD	4.2 $\pm$ 1.5

SD = standard deviation.