



# Developing and Evaluating Bowel Management Guidelines for an Intensive Care Unit

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# Inter-professional Team

We would like to acknowledge the other members of our team:

- John Dziodzio BA, Data Analyst, Pulmonary Medicine
- Shawn Taylor BSN, RN, Nurse Manager, Neuro Critical Care Unit
- Elizabeth Turner MD, CM, MS, FACS, Acute Care Surgery/Surgical Critical Care



# Objectives

The purpose of this presentation is to:

- describe the development and implementation of bowel management guidelines in critically ill adult patients and
- discuss the evaluation of the impact on patient outcomes.



# Introduction

- Depending on the chosen definition, the reported prevalence of diarrhea has been 5–70% (Heidegger *et al.*, 2016) and the rate of constipation 16 – 80% (McPeak *et al.*, 2011).
- A few studies have described development and implementation of bowel management guidelines in adult ICUs (Knowles *et al.*, 2015; Knowles *et al.*, 2013; McKenna *et al.*, 2001; McPeak *et al.*, 2011).
- Despite the availability of these tools to standardize and improve patient outcomes, the use of these tools have remained low (Knowles *et al.*, 2015; Knowles *et al.*, 2013).
- Our assumptions, based on the literature (Knowles *et al.*, 2015; Knowles *et al.*, 2013), were that the development and implementation of bowel management guidelines require an understanding of what clinicians already do in practice, how these guidelines can be adopted within routine practice, and that there was a need to give staff a voice regarding their practice change by actively seeking their input and feedback.

# Background

- In 2018, we conducted a retrospective chart review to investigate the incidence and prevalence of diarrhea and constipation in our critically ill patients (IRB# 1006399).
- The aim was to better understand the usual bowel management practices in our ICUs.
- The data for the study were retrieved from the electronic medical records and included all adult patients (n=4,118) admitted to the ICU in calendar years 2016-2017.
- The findings of our study showed that 68% of the patients had diarrhea and half of the patients experienced constipation at some point during their ICU stay.
- Accurate documentation varied over time between staff members and providers.





# Maine Medical Center MaineHealth

- 637 bed, tertiary-care teaching hospital in Portland, Maine
- 3rd Magnet Designation in 2017
- Level One Trauma Center
- 27,000 inpatients, 500,000 outpatient visits and over 16,000 surgeries a year
- MMC employs over 6,000 staff
- 32-bed Special Care Unit: SCU
  - Medical Critical Care
  - Neuro Critical Care
  - Surgical Critical Care (Trauma & Burns)

# Methods

The purpose of this presentation is to describe the development of bowel management guidelines created by our inter-professional team, to discuss the multifaceted strategies utilized for implementation of the guidelines, and to review patient outcomes before, during, and after the enrollment of the new guidelines.

The goals of our project were to:

1. develop evidence-based bowel management guidelines for critically ill adult patients;
2. engage bedside staff in the development of the guidelines by asking for their feedback;
3. utilize implementation strategies, described in the literature, that have demonstrated effectiveness in practice and to evaluate the efficacy by conducting quarterly audits;
4. improve documentation of bowel management in critically ill adult patients.



# Review of Published Guidelines

- In late 2017, our inter-professional team started this initiative with a search of the literature.
- In 2018, we reviewed fourteen published bowel management guidelines.
- The review focused on the pragmatic aspects for ease of adoption:
  - Constipation guidelines? (Y=yes, N=no)
  - Diarrhea guidelines? (Y/N)
  - Bowel medications? (Y/N)
  - Algorithm with few variables? (Y=easy to follow, N=difficult/confusing with too much information)
  - Clear standards for documentation? (Y/N)



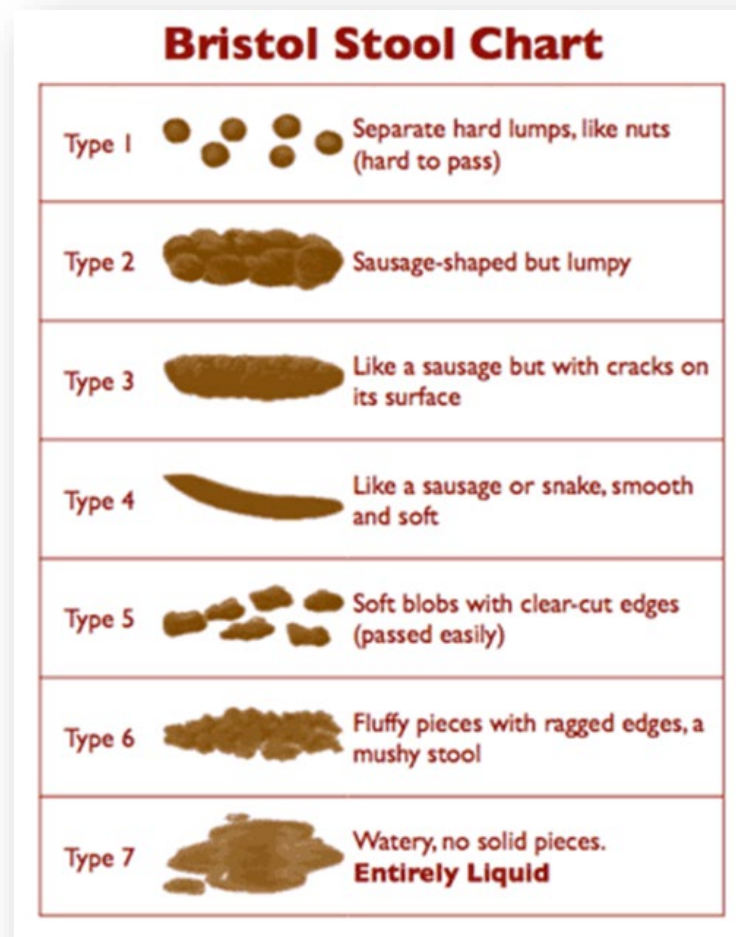


# Summary of the Review of Guidelines

Author(s)	Diarrhea	Constipation	Medications	Easy to Follow	Documentation
Alfred Health (2016)	N	Y	Y	N	N
Collier (2011)	N	Y	Y	N	N
Dorman <i>et al.</i> (2004)	N	Y	N	N	Y
Duddy & Hanna (2005)	N	Y	Y	N	Y
Ferrie & East (2007)	Y	Y	Y	Y	N
Greenwood (2011)	N	Y	Y	N	N
KFI & A Palliative Care Integration Project (2007)	N	Y	Y	N	N
Knowles (2013)	Y	Y	Y	Y	N
McKenna <i>et al.</i> (2001)	Y	Y	Y	N	Y
McPeake <i>et al.</i> (2011)	Y	Y	Y	N	Y
North New Wales Critical Care Network (2013)	N	Y	Y	N	N
Ring (2011)	Y	Y	Y	Y	N
South Western Sidney Local Health District: Bowel Management Guideline (2014)	N	Y	Y	Y	N
Stack <i>et al.</i> (1999)	N	Y	Y	N	N

# Development of Our Guidelines

- Each of the reviewed guidelines had strengths and limitations.
- In January 2018, the team worked together to develop a new set of guidelines for diarrhea and constipation.
- Our guidelines were based on the Bristol Stool Chart assessment and days since last bowel movement with corresponding nursing interventions for each day.



Lewis & Heaton (1997)

# Bowel Management Guidelines

Exclusions listed at the top

**Exclusions:** GI hemorrhage, GI obstruction, abdominal surgery with bowel discontinuity, short-gut syndrome, Crohn's Disease, active or infectious colitis, pancreatitis, patients under 18 years of age

Consider home regimen if history of chronic bowel dysfunction.  
**ON ADMIT START WITH**  
Docusate 100mg bid, Senna 2 tablets nightly

Two parallel guidelines

## CONSTIPATION

**Start if:**  
2 days of no bowel movements

Advance until desired effect achieved then hold at current regimen.

## DIARRHEA

**Start if:**  
Any bowel movement that is a #6 or #7 on the Bristol Stool Scale

Each guideline has a step by step process with correlating days.

If hard stool is felt during bisacodyl administration  
ADD enema

### Step 1 (day 3 of no BM)

Docusate 100mg bid  
Senna 2 tablets nightly  
**ADD PRN bisacodyl suppository**

### Step 2 (day 4 of no BM)

Docusate 100mg bid  
Senna 2 tablets nightly  
PRN bisacodyl suppository  
**ADD Polyethylene glycol 17g in AM**

### Step 3 (day 5 of no BM)

Docusate 100mg bid  
Senna 2 tablets nightly  
**ADD Bisacodyl 10mg PR in morning, may repeat 10mg x1 if no effect in 1 hour AND INCREASE**  
**Polyethylene glycol 17g BID**

### Step 4 (day 6 of no BM)

Docusate 100mg bid  
Polyethylene glycol 17g BID  
Bisacodyl 10mg PR in morning, may repeat 10mg x1 if no effect in 1 hour  
**STOP Senna**  
**ADD Lactulose 15g q 8 hours**

### Step 5 (day 7 of no BM)

Docusate 100mg bid  
Polyethylene glycol 17g BID  
Bisacodyl 10mg PR in morning, may repeat 10mg x1 if no effect in 1 hour  
Lactulose 15g q 8 hours  
**ADD Enema**

Medication	Onset
Polyethylene glycol	1-4 days
Bisacodyl suppository	15-60 minutes
Senna	6-12 hours
Lactulose	24-48 hours

Constipation meds and time of onset

### Step 1 (day 1)

**STOP Laxation**  
**DO NOT STOP** enteral feeds  
Consider etiology such as adverse drug effects (ie: sorbitol containing medications) or infectious process.  
**Guar gum 6gm (2 packets) TID**

### Step 2 (day 2)

Guar gum 6gm (2packets) TID  
**RULE OUT INFECTIOUS PROCESS**

### Step 3 (day 3)

Guar gum 6gm (2packets) TID  
**IF NOT OF INFECTIOUS ETIOLOGY**  
**Loperamide 2mg four times daily**

### Step 4 (day 4)

Guar gum 6gm (2packets) TID  
**INCREASE**  
**Loperamide 4mg four times daily**

### Step 5 (day 5)

Guar gum 6gm (2packets) TID  
Loperamide 4mg four times daily  
**ADD**  
**Diphenoxylate-Atropine 2.5mg q 6 hours.**

Consider imaging or GI consult

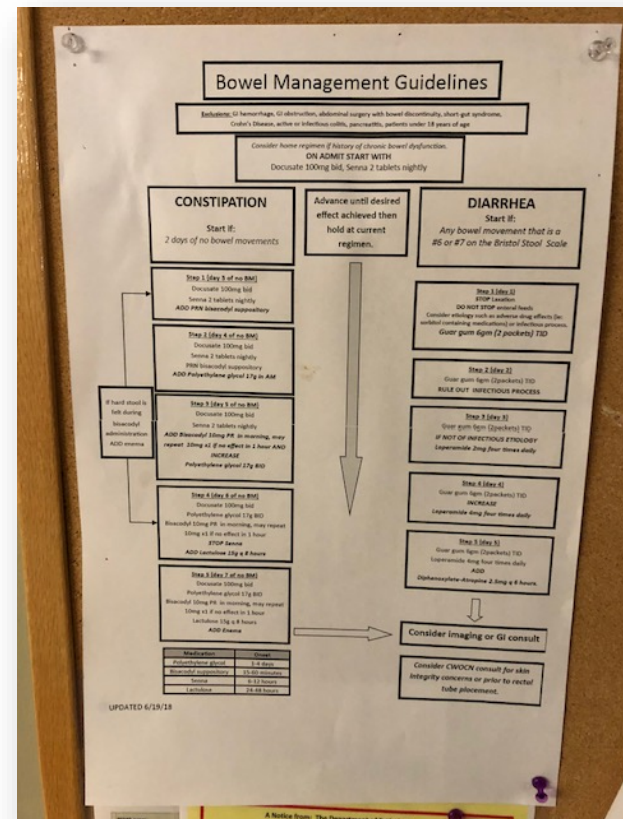
Consider CWOCN consult for skin integrity concerns or prior to rectal tube placement.

Reminders to consult when appropriate

UPDATED 8/22/18

# Implementation: Guidelines

- The multifaceted implementation interventions started on January 30, 2018 and included: express in-service posters, one-on-one education, 30 minute education sessions, and reminder emails.
- The content of the education focused on the rationale for the use of the new guidelines and standardized documentation through the incorporation of the Bristol Stool Chart.



# Implementation: Bowel Management Sidebar

The screenshot displays the 'Bowel Management' sidebar with the following sections:


- BM Summary:** Shows the date of last BM and Bristol Stool Chart description (1-7).
  - Most Recent Value: LBM- Date of Last bowel movement: 08/08/18 filed 08/10/2018 0400
- Bowel Medication Administrations (last 72 hours):** Shows None.
- Liquid Medication Administrations (last 72 hours):** Shows None.
- Diet Orders:** (72h ago through future)
  - Start: 08/09/18 2134, Diet clear liquid, Diet effective now, Ordered: 08/09/18 2133
  - Comments: 08/09/18 0403, Diet NPO except for Sips with meds, Diet effective now, Status: Canceled
  - Question: Except for Sips with meds, Answer: Indication? Bowel rest
- Intake/Output %:** Report
  - 08/09 0701 - 08/10 0700, 08/10 0701 - 08/11 0700
  - I.V. (mL/kg/hr): 1560.38 (0.97)
  - IV Piggyback: 403 (0.25)
  - Total Intake(mL/kg): 1963.38 (29.3)
  - Urine (mL/kg/hr): 1100 (0.68)
  - Total Output(mL/kg): 1100 (16.42)
  - Net: +863.38
  - Urine Occurrence (unmeasured): 1 x

Callouts from the image:

- BM Summary:** date of last BM and Bristol Stool Chart description (1-7)
- Bowel Medication Administrations and any Liquid Medications** that may cause diarrhea
- Diet orders** including tube feeds
- I & O Summary**

# Evaluations & Outcomes

- In March 2018, the outcomes were evaluated in three ways:
  - Nursing feedback survey (*pictured*)
  - Daily open discussion forums
  - Retrospective chart review comparing pre-, during-, and post-implementation outcomes



### Bowel Management Guidelines – Feedback Form

*Please use this as an opportunity to give input on the guidelines.*

Date: \_\_\_\_\_ Room#: \_\_\_\_\_ Team: \_\_\_\_\_ Your Role: \_\_\_\_\_ Name: \_\_\_\_\_

1. Was bowel history discussed during daily rounds? YES ☐ NO ☐

2. Who initiated the conversation?

APP ☐    Attending ☐    Pharmacist ☐    Registered Nurse ☐

Resident ☐    Registered Dietitian ☐    Student ☐    Other \_\_\_\_\_

3. Were the guidelines followed exactly as written? YES ☐ NO ☐

4. Were only certain pieces used? YES ☐ NO ☐

5. What changes were made? \_\_\_\_\_

6. What was the impact of the guidelines on the patient? (Check all that apply)

Decreased agitation ☐    Maintain Skin Integrity ☐    Improve Diarrhea ☐

Improve Constipation ☐    Rectal Tube Removed ☐    None ☐

Other \_\_\_\_\_

7. Were any additional consults utilized? (Check all that apply)

Pharmacy ☐    Wound Team/Continence ☐    Nutrition ☐    Other \_\_\_\_\_

8. What recommendations do you have to improve the guidelines?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Thank you!

When complete, place in the box or return to Shawn.

Questions?

Paul Blakeslee- <a href="mailto:blakep3@mmc.org">blakep3@mmc.org</a>	Sonja Orff- <a href="mailto:ORFFS@mmc.org">ORFFS@mmc.org</a>
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# Nursing Feedback Survey

- The team followed up with the bedside nurses every day for two weeks.
- To encourage participation, we awarded a Bristol Stool Chart mug to the nurse who filled out the most surveys.
- The input shaped the second edition of the guidelines implemented in July 2018.
- This roll out was also followed with surveys and feedback from nursing staff.

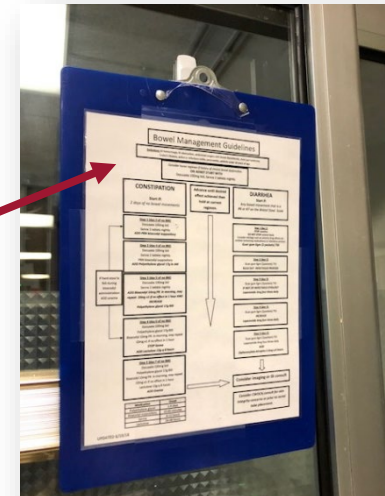




# Open Forums Feedback

- Staff recommendations during the open forums:
  - Decrease the dose of polyethylene glycol (i.e. Mira-Lax)
  - Increase the dose of guar gum (thickener)
  - Initiate guar gum earlier in the regimen
  - Make the guidelines more accessible

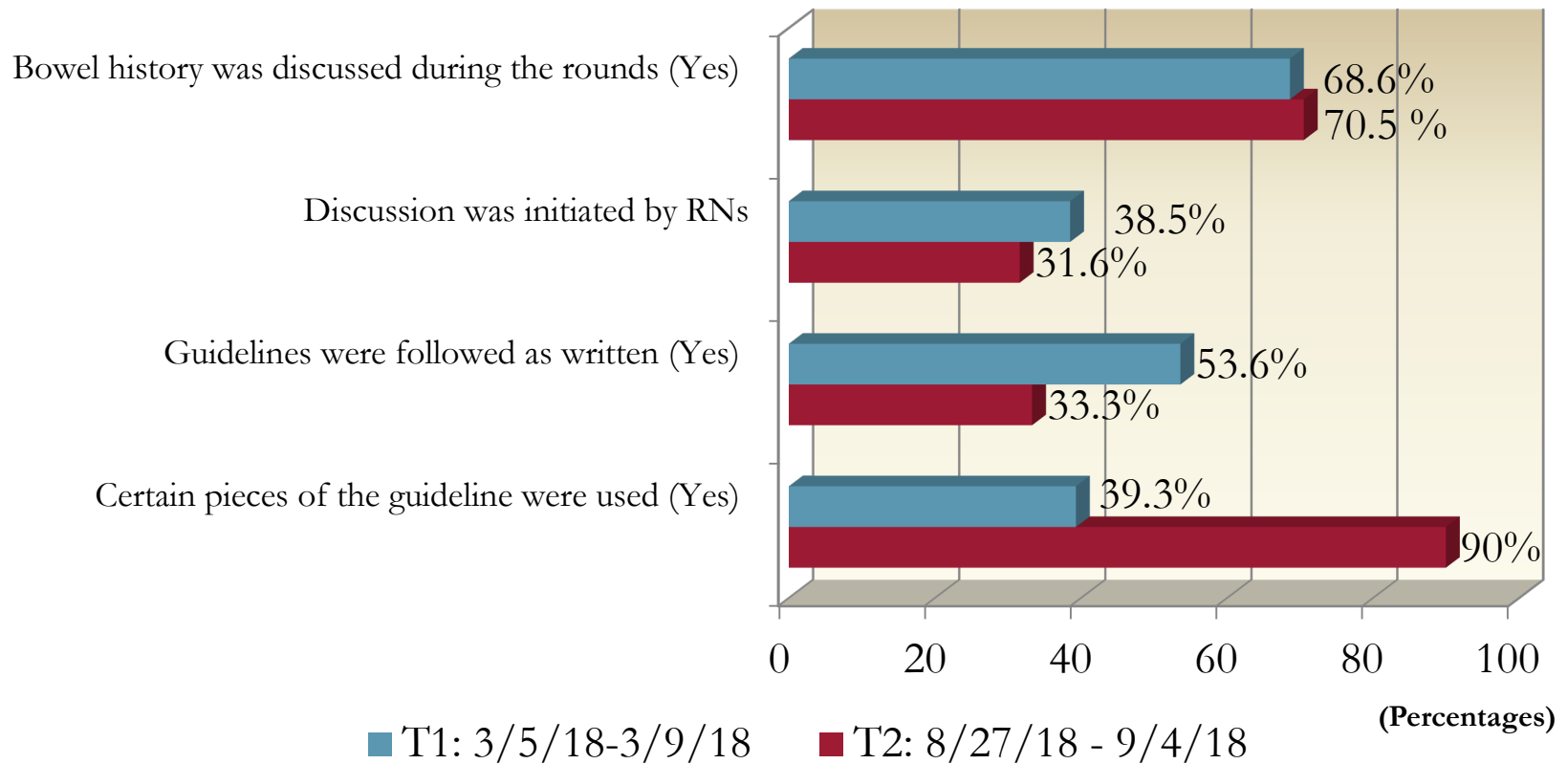
Surgery already had a clipboard outside every room, so we added the guidelines to it!





# Outcomes

The **Nursing Feedback Survey** showed some improvements and changes (Figure 1. below)



# Outcomes (*cont.*)

- The new guidelines were introduced in January 2018:
  - after seven months, the **Nursing Feedback Survey** (T2) showed that staff felt comfortable using the revised guidelines (scale: 1=not at all, 10=very comfortable; Mean 8.89, SD 1.73),
  - regarding “confidence that the guideline works”, the staff reported that they were moderately confident (scale: 1=not at all, 10=very confident; Mean 6.88, SD 1.93).
- The **Open Forums** were organized with the staff four times (March 9, 12, 14 and 16, 2018):
  - notes from these forums provided invaluable insights for the revisions of the guidelines (e.g. laxative doses, timing of bulking agents),
  - the discussions during the forums were also found to be an important strategy to engage the staff and integrate clinical perspective to the research team’s work.

# Outcomes *(cont.)*

- Outcomes were also evaluated from chart reviews comparing diarrhea and constipation incidence rates (see Table below).
- The incidence of diarrhea increased from pre-implementation to guideline and education rollout (2.1%-4.4%,  $p < .0001$ ) reflecting improved documentation, and decreased post implementation (4.4%-2.4%,  $p < .0001$ ).
- The incidence of constipation did not significantly change during the time periods. This result most likely reflects the standardized definition of constipation and the often short length of stay in the critical care units.

Variables \ Time	Pre-Implementation 10/30/17-1/29/18	Guideline and Education Rollout 1/30/18-3/26/18	Post- Implementation 3/27/18-5/29/18
Number of patients	92	55	64
Diarrhea Instances	413	330	196
Constipation Instances	67	35	33
Diarrhea/day	4.49	6.00	3.06
Constipation/day	0.73	0.64	0.51
Diarrhea Incidence Rate Difference		0.0232, $p < .0001$	-0.0206, $p < .0001$
Constipation Incidence Rate Difference		0.0013, $p = .015$	-0.0007, $p = 0.5$

# Outcomes *(cont.)*

## Catheter Associated Urinary Tract Infections (CAUTIs) :

- Number of indwelling catheter-days increased from 5146 days in 2016 to 5284 days in 2017
- Number of CAUTIs reduced from 21 to 7, and the infection rate decreased from 4.1 to 1.32 infections per 1000 device days.
- In 2018, the number of the indwelling catheter-days was on the decline (January – November: 5152 days), but the infection rate has slightly increased (2.14 infections per 1000 device days).

# Conclusions & Discussion

- Findings from this project have provided useful insights into the development and implementation process of the bowel management guidelines.
- This inter-professional, collaborative project utilized multifaceted strategies for operationalization and a variety of approaches to evaluate patient outcomes.
- Further research is required to explore the long-term efficacy of the guidelines on patient outcomes and staff satisfaction.
- The next steps include:
  - part two (IRB #1369741) of the study focusing on years 2018–2019 and
  - confirming plans for sustainability of guideline utilization.

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# Questions?

