



Clinical Safety & Effectiveness  
CS&E Cohort #19

# Inpatient Bowel Prep

# The Team

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- Sponsor Department:
  - Department of Medicine, Division of Gastroenterology

# Background

- Dik et al. showed that current hospitalization was an independent risk factor for poor bowel preparation (OR 1.8,  $p < 0.001$ )<sup>1</sup>
- Repeating procedures subjects the patient to the inconvenience of additional bowel preparation and increases the cardiac and respiratory risk associated with moderate sedation<sup>2</sup>
- The purpose of our quality improvement project is to decrease the number of inpatient colonoscopies with an inadequate bowel preparation using a standardized order set

# Background

- Chambers et al. reported that prior to implementation of an order set, physicians rated colon preparation as fair or poor (inadequate) in 78% of inpatient colonoscopies<sup>3</sup>
- In their study, an electronic order set along with staff, physician, and patient education on colonoscopy preparations led to a 46.1% decrease in the number of patients with inadequate bowel preparation and decreased the number of failed colonoscopies<sup>3</sup>

# Project Milestones

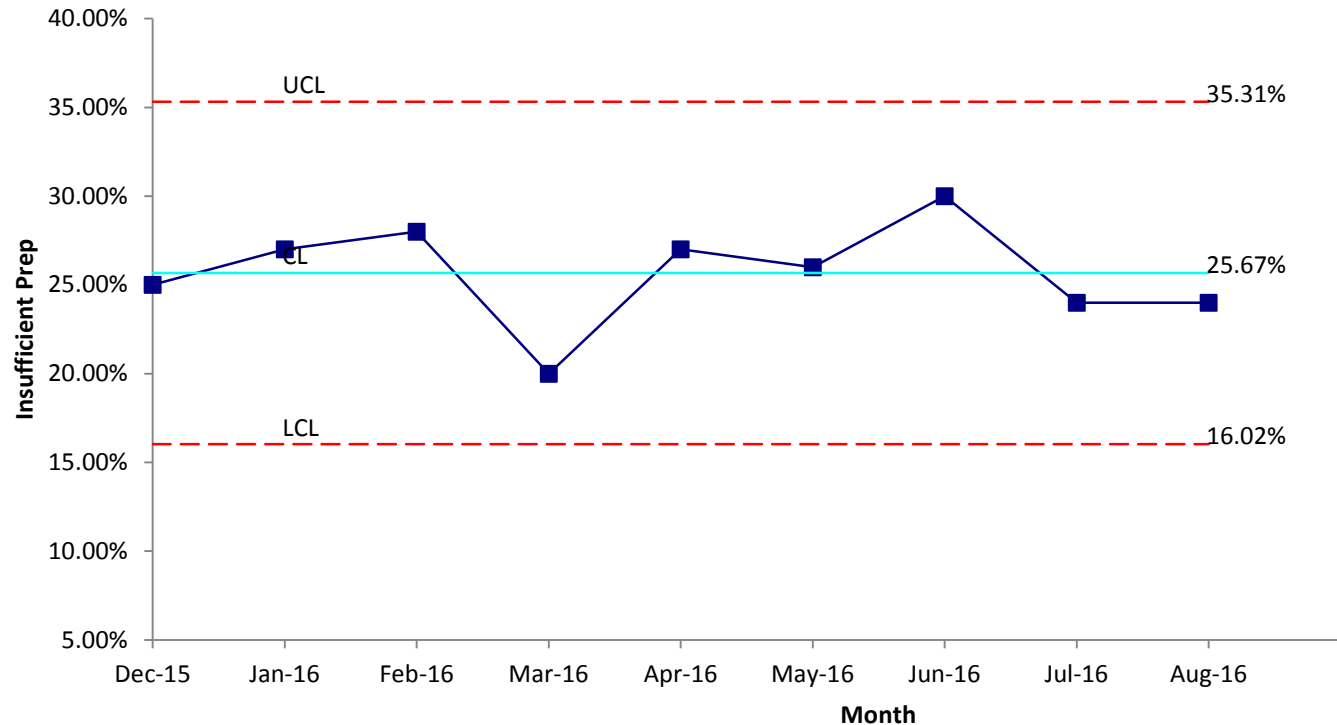
- Team Created August 2016
- AIM Statement Developed August 2016
- Weekly Team Meetings Aug to Nov 2016
- Background Data, Brainstorm Sessions, Workflow and Fishbone Analyses Sept 2016
- Interventions Implemented Nov 29<sup>th</sup> 2016
- Data Analysis Nov 29<sup>th</sup> 2016- Dec 29<sup>th</sup> 2016
- CS&E Presentation Jan 2017

# Background Data-Inadequate Bowel Preparation

Inpatient Colonoscopy Bowel Preparation Ratings						
	Adequate	Adequate	Inadequate	Inadequate		
	Excellent	Good	Fair	Poor	Total	Percent Inadequate
Dec-15	17	4	3	4	28	25%
Jan-16	18	6	4	5	33	27%
Feb-16	21	2	4	5	32	28%
Mar-16	20	5	3	3	30	20%
Apr-16	13	3	2	4	22	27%
May-16	14	6	2	5	27	26%
Jun-16	16	3	4	4	27	30%
Jul-16	12	7	3	3	25	24%
Aug-16	14	5	5	1	25	24%
					Median	26%
					Mean	25.60%

# Background Data-Inadequate Bowel Preparation

**Patients With a Poor Bowel Preparation**



# Background Data-Cancelled Procedure

Date of Procedure	Inpatient or Outpatient	Delayed, Rescheduled or Cancelled (If delayed or rescheduled please include how long the delay was or how many days till rescheduled procedure)	Please list any contributing factors (ex. patient did not tolerate the volume or taste; bowel prep held because patient was clear, etc.)
9/7/16	Inpatient	Reschedule to next day	Solid food until noon day prior
9/8/16	Inpatient	Reschedule to next day	Did not tolerate prep 2/2 bloating/nausea
9/9/16	Inpatient	Reschedule Monday	Inspite of full prep, non clean
9/12/16	Inpatient	Reschedule to next day	Needed more enemas

- Around 10% of inpatient colonoscopies are cancelled per month, prior to starting, due to a failed bowel preparation



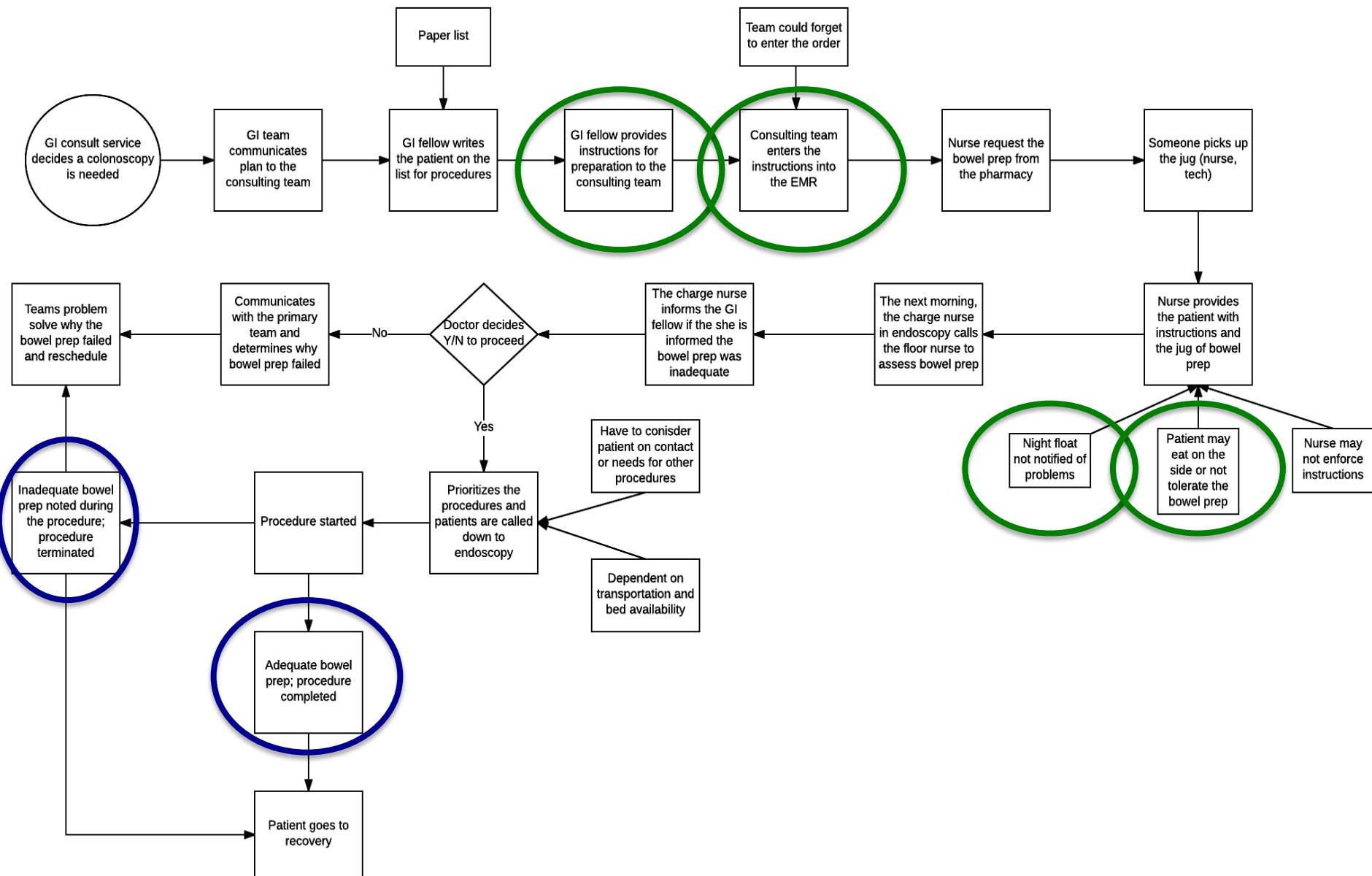
# Background Data

- The mean number of colonoscopies with a rating of fair or poor (inadequate) in our inpatient bowel preparations is approx. 25%
- Limitations: We were unable to obtain the percentage by hospital floor because patients relocate during their stay and because this data is not generally recorded when we schedule procedures

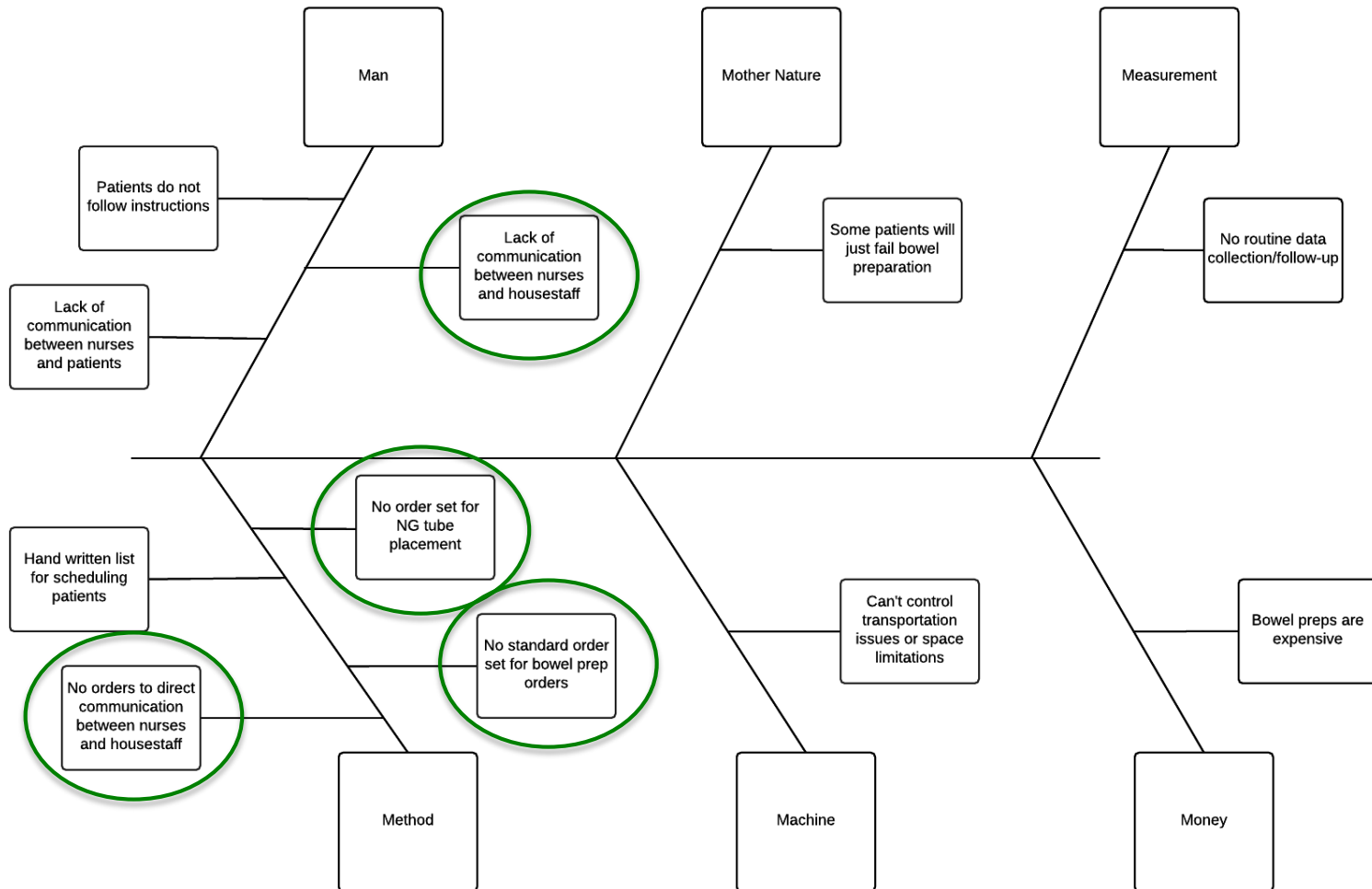
# AIM statement

To decrease the number of inpatient colonoscopies with an inadequate bowel preparation score by 50%, from an average of 24% to 12%, by Jan 2017

# Process Evaluation



# Process Evaluation



# PLAN: How the process should run

Primary team calls the gastroenterology fellow to request an evaluation for colonoscopy



Gastroenterology fellow evaluates the patient and determines the patient requires an inpatient colonoscopy



Gastroenterology fellow communicates this to the primary team and patient



The housestaff completes the standard order set including the instructions for the nursing staff

# PLAN: How the process should run

Patient successfully completes a bowel preparation overnight



Patient is available the morning of the procedure and quickly arrives in the endoscopy unit



Patient undergoes a colonoscopy with an adequate bowel prep rating



Patient recovers and returns to the floor

# PLAN: Brainstorming

- Lack of communication between nurses and patients
  - Implement an order set that facilitates triaging bowel preparation issues
  - Educate nurses on where we are lacking during patient bowel preparation
  - Gastroenterology fellows could better prepare patients for the process of bowel preparation so they know when to bring up issues with the nurses
- Lack of communication between nurses and housestaff
  - Implement an order set that instructs nurses when to inform the housestaff of bowel prep issues
  - Educate nurses on when they should be communicating bowel prep issues to the house staff
  - Educate the housestaff on how they should be triaging bowel prep related issues overnight
- No order set for NG tube
  - Implement an order set that instructs the nurses when to notify the housestaff the patient is nauseated and may require NG tube
  - Educate the housestaff on being more proactive on using an NG tube for bowel prep intolerance
  - Gastroenterology fellows could better prepare patients for expecting an NG tube if they cannot tolerate a bowel prep
- No standard order set for bowel prep instructions
  - Implement an order set with standard instructions for nurses and patients

# DO: Order Set Example

Orders Medication List Document In Plan

Add to Phase
 Check Alerts
 Start: 
Duration:

Component	Status	Details
<b>Endoscopy: Colonoscopy &amp; Prep (Initiated Pending)</b>		
<b>Diet/Nutrition</b>		
<input checked="" type="checkbox"/> Clear liquid diet		Day prior to procedure only
<input checked="" type="checkbox"/> NPO		except meds, after evening meal
<b>Nursing</b>		
<input checked="" type="checkbox"/> Clinical Communication		Call Endoscopy Suite @ 828-8859 for procedure schedule time
<input checked="" type="checkbox"/> Notify Provider		For: prep not tolerated
<input checked="" type="checkbox"/> Notify Provider		For: nausea continuing after decreased frequency of golytely
<input checked="" type="checkbox"/> Notify Provider		For: stool is not transparent at completion of prep
<input checked="" type="checkbox"/> Teach pt/primary caregiver		Colonoscopy Procedure and Prep. Utilize Material - Inpatient Colonoscopy, VCUHS (custom) in Patient Education Materials (Custom Tab) and save to Patient ...
<b>Saline Lock Management</b>		
<input type="checkbox"/> Saline lock		Start if no functional IV already in place
<input type="checkbox"/> sodium chloride (NaCl 0.9% Cath Flush)		1 mL, Injectable, IV Flush, every 8 hours, Give first dose: Routine
<b>Medications</b>		
<input type="checkbox"/> golytely powder		Select an order sentence
<input checked="" type="checkbox"/> bisacodyl		10 mg, Tab, PO, Unscheduled, at 18:00 and at 22:00 evening before procedure, X 2 Doses(Times), Give first dose: Routine
<b>Diagnostic Tests</b>		
<input checked="" type="checkbox"/> Colonoscopy		
<b>Non Categorized</b>		



# DO: Order Set

## Order Set

Diet-

Clear liquid diet

NPO at midnight except for bowel prep

Unsweetened tea or diet lemonade to be added to bowel preparation

Nursing-

Notify provider- For: prep not tolerated

Notify provider- For: nausea continuing after decreased frequency of bowel preparation

Notify provider: For: stool not clear at completion of prep

Medications:

Golytely powder-Instructions: Begin 2 L of bowel preparation at 8pm the night prior to the colonoscopy. This is to be finished in 2 hours or 8 ounces every 15 min. Begin the second 2 L of bowel preparation at 4 AM the morning of the procedure. This is to be finished in 2 hours or 8 ounces every 15 min.

# DO: Order Set

Requested By: ☒ Me ☐ Other: Source: [Allergy Details](#)

Date:  Time:

Session  
Type:  Reason:

Manual Entry  Searching for ...

Order	Cost
Inpatient Clinical Pharmacy Consult (IV to PO Conversion Protocol) (Consult (Inpatient) (Clinical Pharmacy) IV to PO Conversion) .	
Inpatient Colonoscopy Order Set	
Inpatient Consult (Consult Inpatient Ancillary Services)	
Inpatient Consultation (Consult Inpatient Ancillary Services)	

[Add...](#)  
[View...](#)  
[Item Info](#)  
[Add to Favorites](#)  
[Message](#)  
[Drug Info](#)

[Edit...](#)  
[Delete](#)  
[Copy...](#)  
[Add Specimen...](#)  
[Indication...](#)

[Submit Order\(s\) for IBARRA, JOSE SUAREZ](#) [Hide Worksheet](#) [Cancel](#) [Help](#)

# DO: Order Set

Medications								
	Order	Dose	Dose Units	Route	Frequency	PRN ?	PRN Reason	Nursing Instructions
<input checked="" type="checkbox"/>	<b>Oral Lavage Powder</b>	1	Bottle	Oral	Once	<input type="checkbox"/>		Begin 2 L of bowel preparation at 8pm the ni

◀ ▶

**Nursing**

- ☒ **Nursing Care** [Subject] [Frequency] - Notify provider- For: prep not tolerated by the patient
- ☒ **Nursing Care** [Subject] [Frequency] - Notify provider- For: nausea continuing after decreased frequency of bowel preparation
- ☒ **Nursing Care** [Subject] [Frequency] - Notify provider: For: stool not clear by 7 AM the day of the procedure

**Nutrition Services**

- ☒ **DIET Liquid Diet Order** Able to Call: Not appropriate (chef choice w... Type: Clear Liquid [Oral Supplement] [Amount of Oral Supplement]  
[Oral Supplement Frequency] Instructions: Clear liquid diet previous day; Unsweetened tea or diet lemonade to be added to bowel preparation
- ☒ **DIET NPO Order (no tube feedings)** Type: NPO except meds w/ sips water Instructions: NPO at midnight except for bowel prep

**Respiratory Therapy**

**Pharmacy**

Drug Info ▼

OK Cancel

# DO/STUDY: Education

- Internal medicine housestaff was educated on appropriate triaging of problems that arise during inpatient bowel preparation
- Weekly reminders were used to reinforce that the order set was in use and requested feedback

# STUDY: Communication

- Feedback was requested from the nurses regarding the order set and is currently pending

# STUDY: Post-Intervention Data

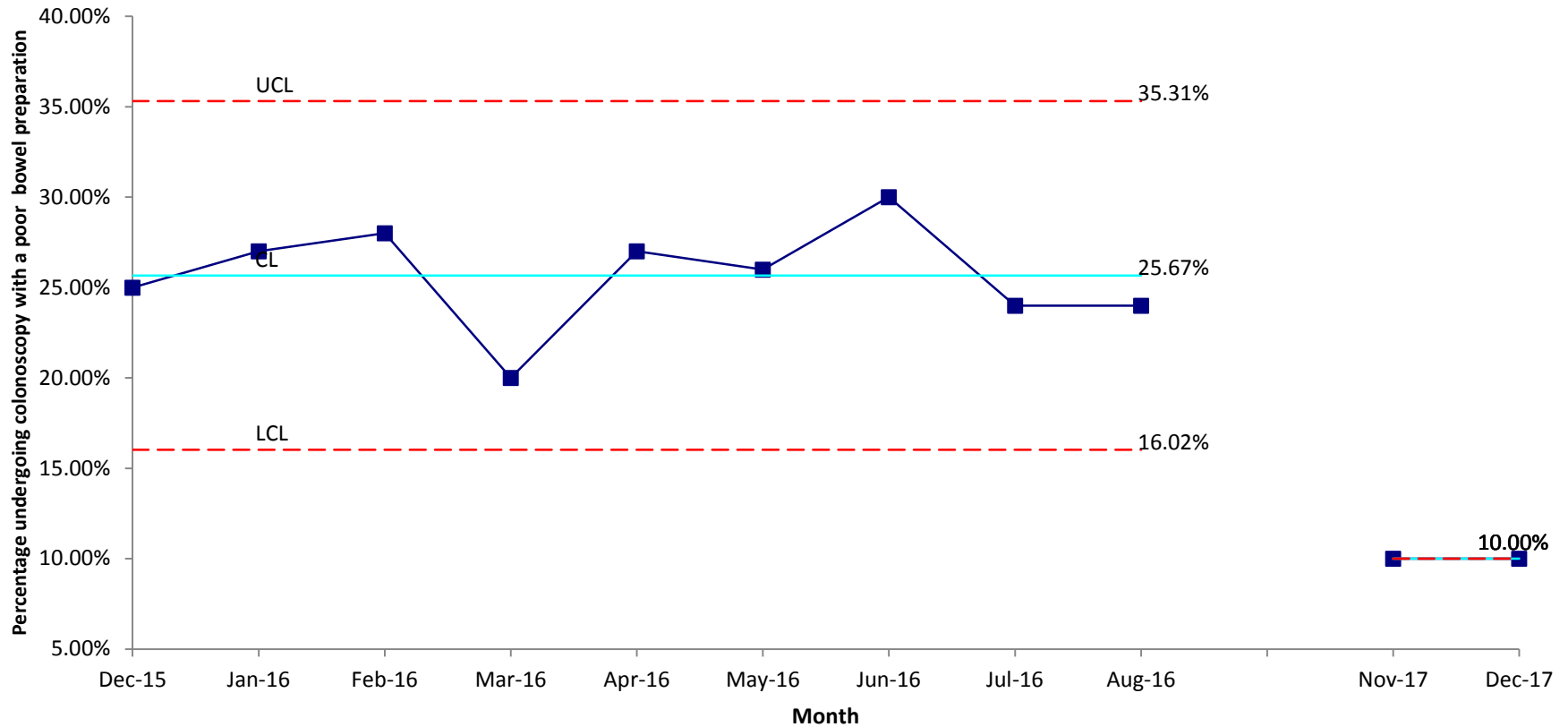
- We collected data for the month following implementation of the intervention to assess if the percentage of inpatient colonoscopies with an inadequate bowel preparation decreased

# Post-Intervention Data

Inpatient Colonoscopy Bowel Preparation Ratings					11/29-12/29	
	Adequate	Adequate	Inadequate	Inadequate		
	Excellent	Good	Fair	Poor	Total	Percentage Bowel Prep
WEEK 1	7	4	0	1	12	
WEEK 2	6	3	0	1	10	
WEEK 3	3	4	1	0	8	
WEEK 4	3	2	1	0	6	
WEEK 5	4	0	0	0	5	
	23	13	2	2	40	10.0%

# Post-Intervention Data

## Patients With a Poor Bowel Preparation





# Post-Intervention Data

- We achieved our goal of a 50% decrease in the number of colonoscopies with an inadequate rating in the first month after implementing the order set

# Return on Investment

- For each day we prevented patients remaining in the hospital solely to repeat a colonoscopy, it is estimated we saved approx. \$2,050.00
- As our AIM of decreasing by 50% was reached, the system potentially saved \$30,000 in the first month following intervention

# ACT: Sustainability

- Since we showed that using the order set can decrease the number of inadequate bowel preparations we hope this will ensure continued use throughout our department
- We will continue to collect feedback from the nurses as well as the housestaff
- Once we have optimized the order set, integrating the feedback, we plan to prospectively follow usage and its impact on bowel preparation long term

# ACT: Future Plans

- We plan on improving the types of bowel preparations available at UHS to more palatable versions
- We plan on improving the scheduling of inpatient procedures to minimize wait times

# References

1. Dik et al. Predicting inadequate bowel preparation for colonoscopy in participants receiving split-dose bowel preparation: development and validation of a prediction score. *Gastrointestinal Endoscopy*. 2015 Jan 16.
2. Hayes et al. Bowel preparation comparison, flavored versus unflavored Colyte. *Gastroenterology Nursing*, 26, 106–109. 2002.
3. Chambers et al. Improving Inpatient Colonoscopy Preparation in a University Hospital: An Evidence-Based Practice Project. *Gastroenterology Nursing*. 2016 Mar-Apr;39(2):86-94.

# Questions?

