

Reducing inappropriate testing for  
*Clostridium difficile* infection (CDI) in  
an academic medical center  
through a collaborative approach

Claire Ciarkowski, MD, FACP

---



[Claire.Ciarkowski@hsc.utah.edu](mailto:Claire.Ciarkowski@hsc.utah.edu)

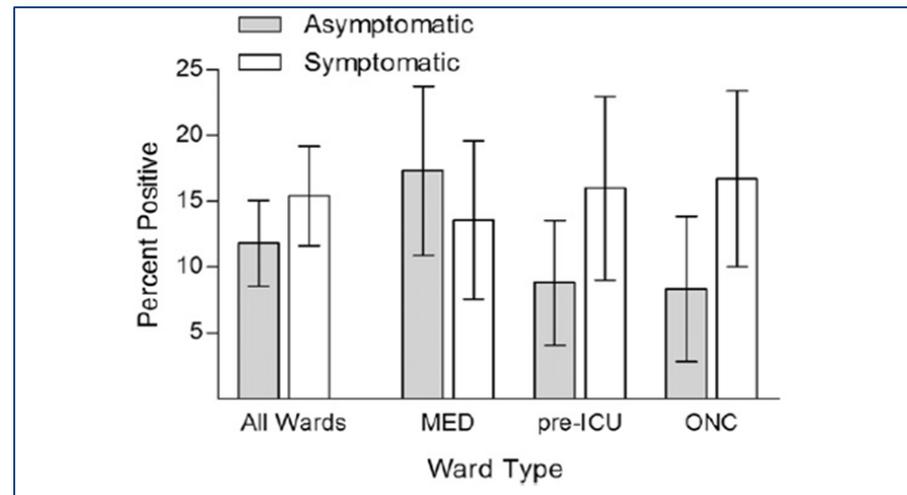
# THE PROBLEM: INAPPROPRIATE TESTING FOR CDI

- Potential harm to patient:
  - Misdiagnosis
  - Unneeded antibiotic treatment
  - Unnecessary expense

# WHY DO WE HAVE THIS PROBLEM?

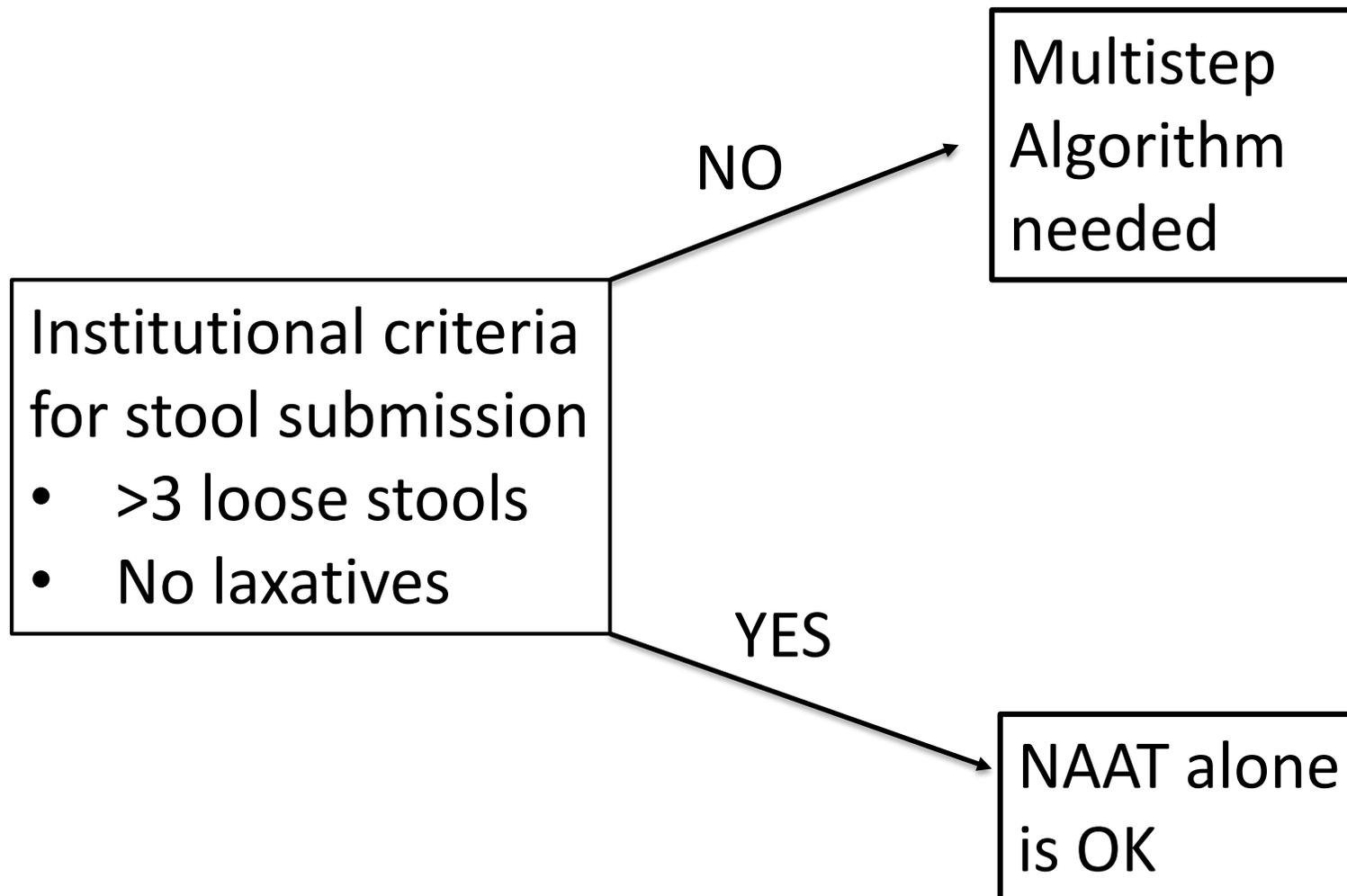
- Nucleic Acid Amplification Test (NAAT) is very sensitive but not specific
  - Unable to distinguish between true disease and colonization

Asymptomatic carriage rate 11.6%  
Positivity rate in symptomatic 15.4%  
P value = 0.19



- Etiology of loose stools
  - 40-50% of patients tested are receiving laxative

# RATIONALE: IDSA/SHEA GUIDELINES UPDATE



# WHY IS THIS IMPORTANT TO US?

- Current state
  - No institutional guidance to restrict stool being sent the lab
- Standardized Infection Ratio higher than expected
  - National quality metric
  - By reducing unnecessary testing we can help reduce false positives

# SPECIFIC AIM: PURPOSE OF INTERVENTION

- To reduce the number of inappropriate CDI testing
  - Develop and implement an EHR clinical decision support Best Practice Advisory (BPA)
    - Cancel repeat tests
    - Alert providers of laxative administration use
  - Create multidisciplinary team to disseminate best practice
  - Recognize barriers

# STEP 1: BPA FOR CDI TESTING: 9/25/17

## C. DIFFICILE results within 7-14 days

BestPractice Advisory -

▼ Care Guidance (1 Advisory)

⚠ Test for toxin was negative within last 7 days.  
Multiple studies have shown repeat testing is ineffective for diagnosis of C difficile infection and increases the chance for false positives. Given the PCR's high negative predictive value, only one test should be ordered over a 7 day period.

Acknowledge reason:

Remove unsigned order: Clostridium Difficile Toxin B Gene by PCR Once - Routine - Lab First occurrence Today at 1445 Do you want to change the specimen collection from what [...]

BestPractice Advisory -

▼ Care Guidance (1 Advisory)

⚠ Test for toxin was positive within last 14 days.  
Repeat testing for test of cure NOT recommended.

Acknowledge reason:

Remove unsigned order: Clostridium Difficile Toxin B Gene by PCR Routine, ARUP, Qty 1, Expected 6/23/2017 Approximate, Expires 6/23/2017, Resulting Agency - ARUP

- Acknowledge reason required if BPA declined
- “Cancel” button not available
- Lab still has ability to cancel tests that do not meet criteria

# STEP 1: BPA FOR CDI TESTING: 9/25/17

Laxative given within 48 hours

BestPractice Advisory -

▼ Care Guidance (1 Advisory)

**Testing NOT recommended.**  
Laxative(s) have been administered over the previous 24 hours and are the likely etiology of loose stools. Review the MAR for type and amount of laxative administered. Consider discontinuing laxatives and re-evaluate for diarrhea and testing in 24 hours.

Acknowledge reason:

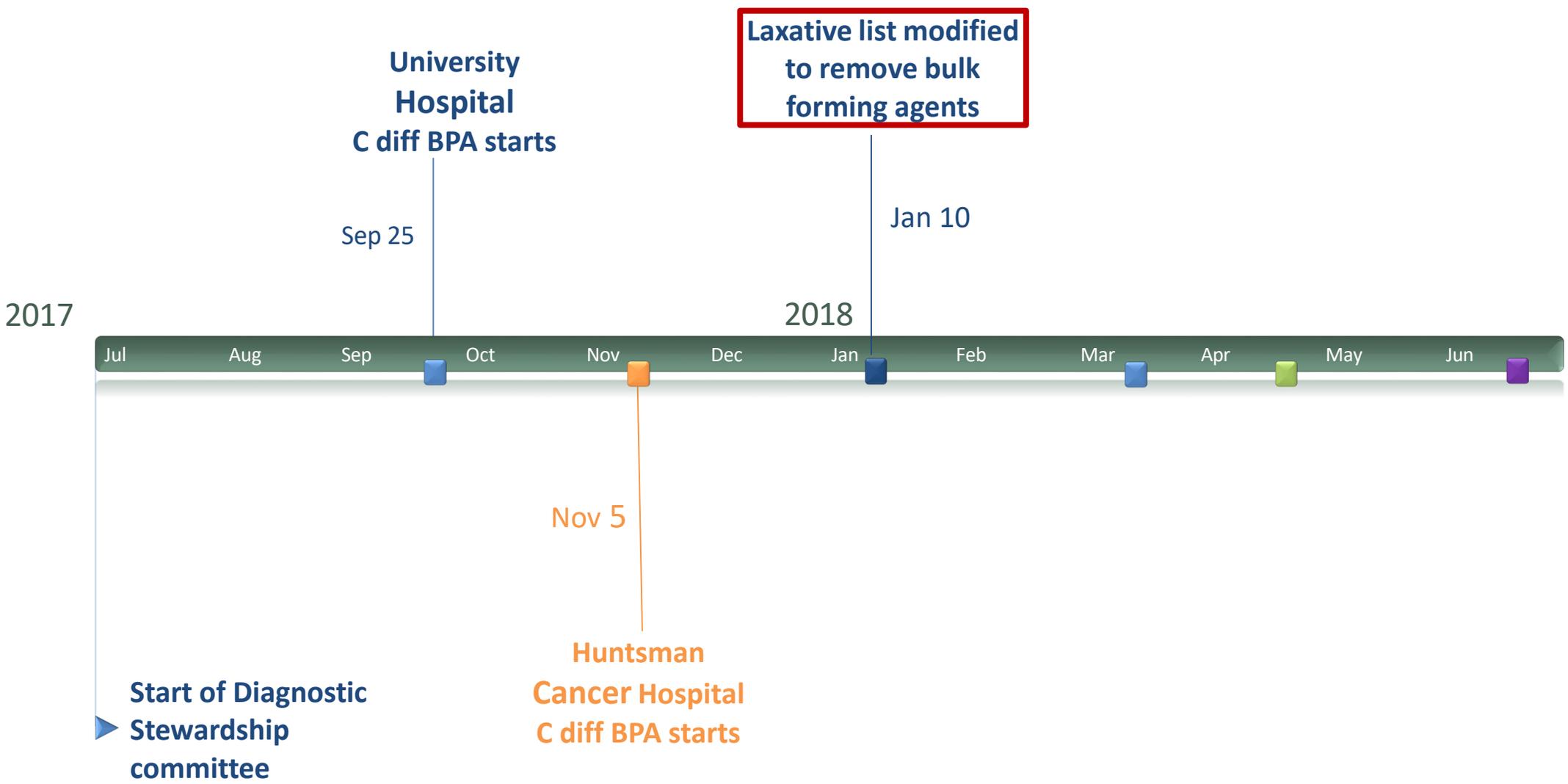
Remove unsigned order: Clostridium Difficile Toxin B Gene by PCR Once - Routine - Lab First occurrence Today at 1527 Do you want to change the specimen collection from what [...]  
[Go to the MAR](#)

- Acknowledge reason not required if BPA decline
- “Cancel” button is available
- Lab still has ability to cancel tests that do not meet criteria

# USING FEEDBACK TO MODIFY BPA

- No stool x 3 days
- Has *Clostridium* wound infection
- Leukocytosis
- Per Dr.
- Has been on antibiotics
- WTF
- This is the test we want

# C DIFF COLLABORATION TIMELINE: BPA FEEDBACK





# C DIFF COLLABORATION TIMELINE

## Creating CDI collaborative

Physicians, nurses,  
pharmacists, informaticians, and  
laboratory directors

CDI collaborative meeting

Mar 3

2017

2018



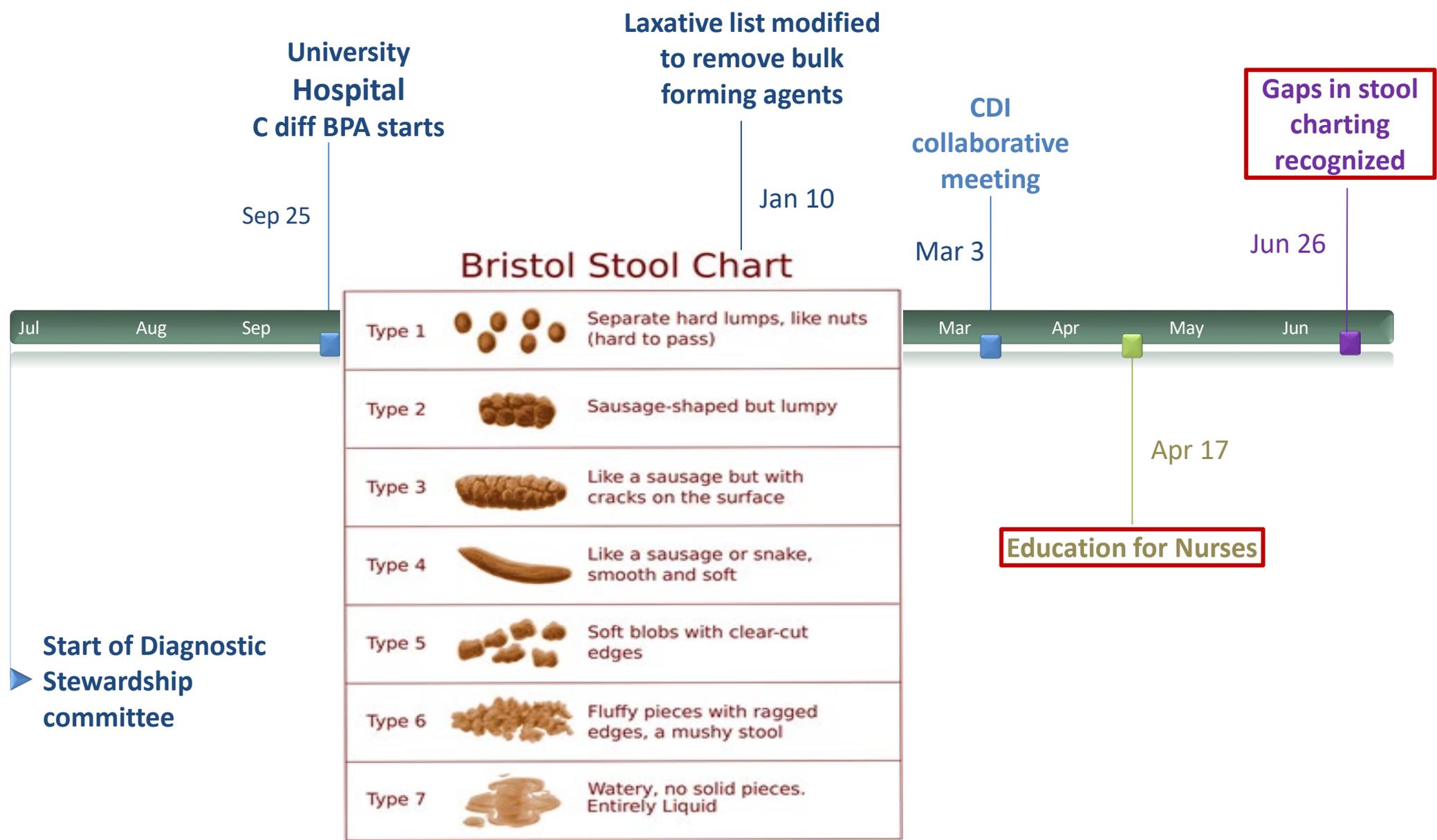
Start of Diagnostic Stewardship committee

Nov 5  
Huntsman Cancer Hospital  
C diff BPA starts

# C DIFF COLLABORATION TIMELINE: NURSING



2017



# STUDY OF THE INTERVENTION

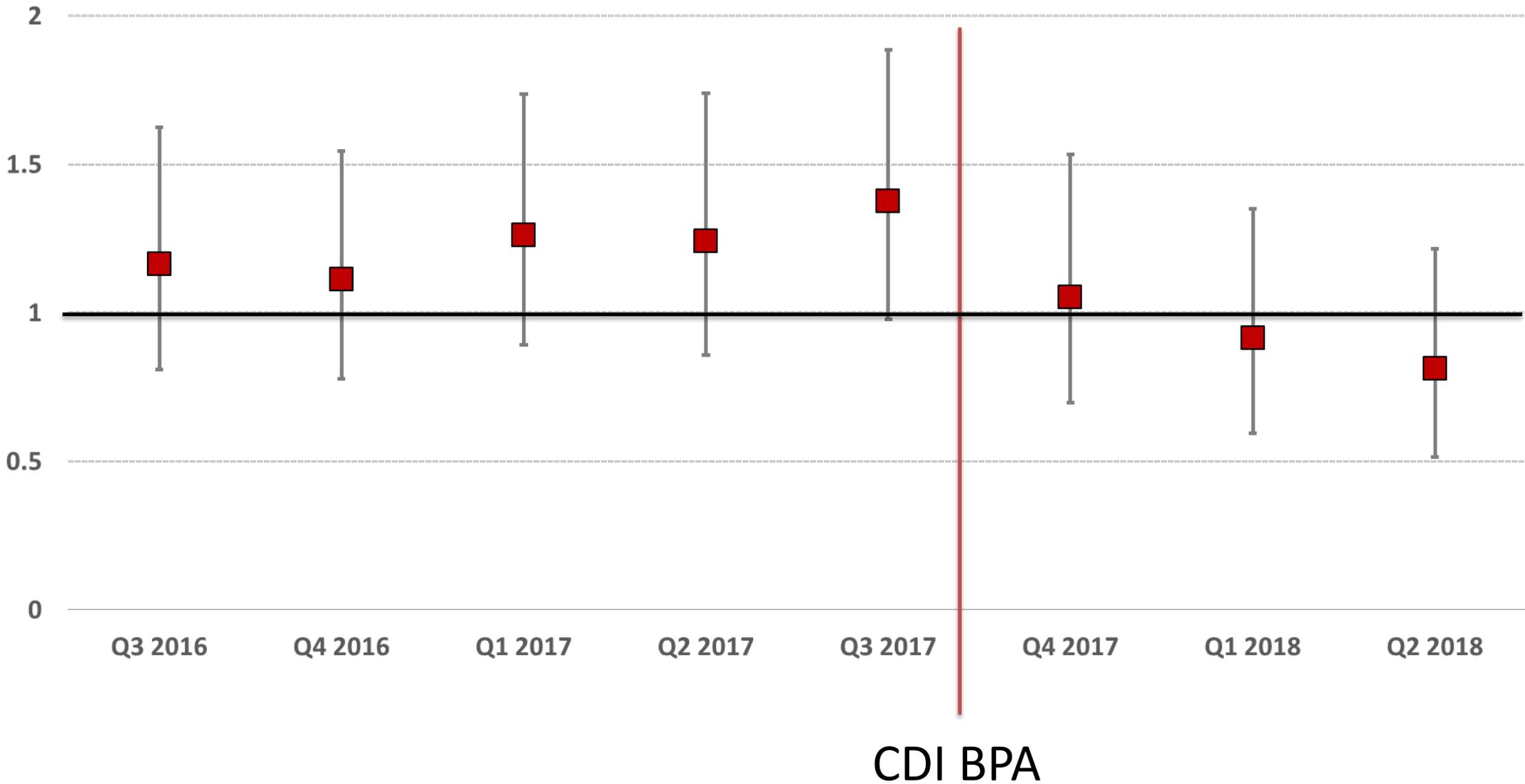
- Patients
  - Patients with *C diff* PCR ordered
- Timeframe
  - Baseline data 9/1/2016 - 9/1/2017
  - BPA live on 9/25/2017
  - RNs education 4/17/2018
- Measures
  - *C diff* orders per month pre and post intervention
  - National benchmark standardized infection ratio (SIR) metric for hospital onset CDI cases

# RESULTS: TOTAL ORDERS PER MONTH



# RESULTS

## HO CDI LabID Standardized Infection Ratio



## LIMITATIONS

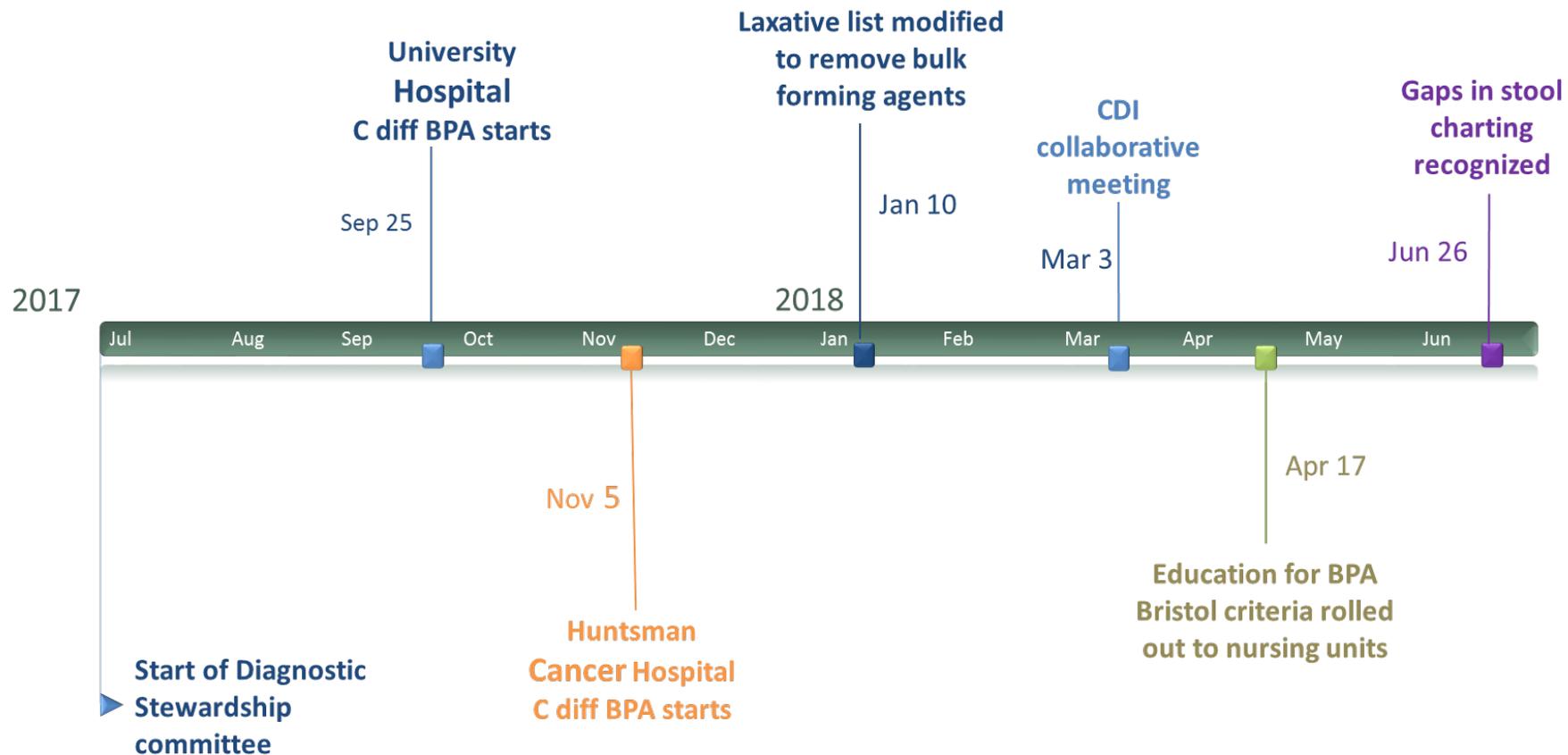
- BPA does not have a hard stop
- False positives are likely still occurring

## FUTURE DIRECTIONS

- Change lab ordering to multi-step algorithm
- Continue to improve stool recording in Epic

# DISCUSSION: WHAT DOES IT MEAN?

- Successful implementation of a QI improvement project requires multiple rounds of a Plan-Do-Act-Study cycle.



# THANK YOU

[Claire.Ciarkowski@hsc.utah.edu](mailto:Claire.Ciarkowski@hsc.utah.edu)

Jeanmarie Mayer, MD  
Emily Spivak, MD  
Tristan Timbrook, PharmD  
Jamie Fendler  
Kathrine Spangler, MD

## Questions?



# C DIFF COLLABORATION TIMELINE

