**Presentation Type:**
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**Subject Category:** C. difficile

## Pilot of a Bowel Habit Assessment Tool to Enable Early Identification of C. diff Infection

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**Background:** Gastrointestinal conditions are common in hospitalized patients. Decreased mobility, dietary changes, medications and their underlying illness may alter patients' bowel movements. It's important for health care providers to be aware of patient's bowel habits, especially for early identification of Clostridiodies difficile infection (CDI). Prior research has shown that patient modesty may be a barrier to discussing bowel habits with nurses and providers. This can lead to delay in diagnosis of CDI, lack of timely isolation and possible misclassification of community onset CDI cases as hospital onset (HO-CDI). **Methods:** A Bowel Habits Assessment Tool (BHAT) was developed to assist health care providers in learning skills to assess and document patient bowel habits accurately. The tool provides a structured approach to help clinicians gather relevant information, identify abnormalities, and promote effective communication with patients. The tool was developed by an infectious disease physician and modeled on existing tools utilized to take a sexual history. A team of infectious disease physicians, nurses and a gastroenterologist reviewed the tool and provided feedback. See Table 1. The tool was introduced as a pilot program at a 180 bed academically affiliated Veterans Affairs Hospital. Micro educational sessions were held to provide education about the importance of a bowel habit history, introduce the tool and teach its use in clinical care. The teaching sessions were led by an Infectious Disease physician and a nurse infection preventionist. An anonymous pre and post survey employing a 5-point Likert scale was administered to participants. All participation was voluntary. This project was reviewed and approved as a Quality Improvement by the VA Research Office, Eastern Colorado Health Care System. **Results:** Twenty nine healthcare personnel participated in the pilot. Participants included nurses (13), resident physicians (13), medical students (2) and nursing assistants (1). 59% of participants stated that they strongly agree with the statement "I am comfortable discussing patient's bowel habits" on the pre-survey. (Question 1). This increased to 73% after the BHAT educational session. The mean difference between pre and post survey responses for question one was 0.45 (CI 0.08761 to 0.8089, p= 0.0167). All participants found the BHAT related to their work and useful, with 41% strongly agreeing and 52% somewhat agreeing that the BHAT was useful. See figure 1: Survey Responses. **Conclusions:** The effectiveness of a bowel habit assessment tool was demonstrated using a pre and post survey. BHAT improved clinicians comfort level discussing patient's bowel habits.

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| Outline of the Bowel Habit Assessment Tool (BHAT) |
|---|
| 1. Introduction |
| 2. Set the stage |
| 3. Step-by step Assessment Guide |
| 4. Bristol Stool Scale |
| 5. Quick Tips |

**Table 1:** Outline of the Bowel Habit Assessment Tool (BHAT). The BHAT is a 3 page guide. The introduction states that bowel habits can be a taboo subject and highlights the importance of an accurate bowel habit history. The step by step guide details a suggested dialogue with the patient. A picture of the Bristol Stool scale is provided for reference.

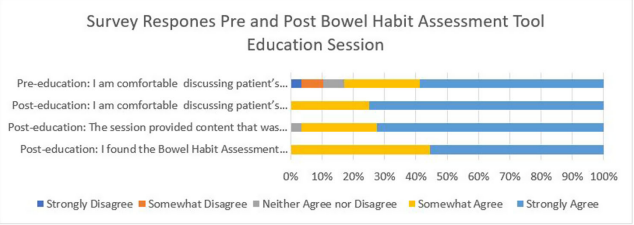


**Figure 1:** Survey Responses pre and post a bowel habit assessment tool education session. Responses utilized a 5-point Likert scale.

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## Assessing Clinical Outcomes for C. diff Polymerase Chain Reaction (PCR)-positive, Enzyme Immunoassay (EIA)-negative Patients

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**Background:** In August 2021, Saint Luke's Health System (SLHS) transitioned Clostridioides difficile (C. diff.) testing from polymerase chain reaction (PCR)-only to two-step enzyme immunoassay (EIA) reflex following PCR+ for suspected C. diff. infection. Uncertainty in patient management may arise when PCR and EIA testing differ. Previous studies suggested that disease severity varies when a patient's results demonstrate PCR+ and EIA- due to possible colonization. Clinicians may not treat if diarrhea self-resolves, patients remain stable, or alternate causes of diarrhea exist. We compared clinical outcomes of patients who received treatment to those who did not. **Methods:** This was a retrospective cross-sectional study from August 2021-August 2023 in a multi-site, integrated health system, comparing 181 inpatients with PCR+/EIA- C. diff. test results stratified by no treatment (0-48 hours of C. diff. targeted treatment), partial treatment (2-9 days), or full treatment (10+ days). The primary outcome was length of stay. Secondary outcomes were readmission rates, need for colectomy,

Table 1 (ANOVA analysis)

| | Treatment Groups | | | Total | |
|---|---|---|---|---|---|
| | Full n=144 | Partial n=17 | None n=20 | n=181 | P-Value |
| Length of Stay (days) | 12.2 ± 14.0 | 12.0 ± 7.6 | 9.0 ± 9.2 | 11.8 ± 13.1 | 0.585 |
| 30 Day Readmission | 29 (20.1%) | 3 (17.6%) | 5 (25.0%) | 37 (20.4%) | 0.841 |
| Colectomy | 6 (4.2%) | 1 (5.9%) | 1 (5.0%) | 8 (4.4%) | 0.820 |
| ICU Admission | 35 (24.3%) | 6 (35.3%) | 8 (40.0%) | 49 (27.1%) | 0.230 |
| Diarrhea Resolved | 66 (61.1%) | 11 (78.6%) | 10 (71.4%) | 87 (64.0%) | 0.364 |

Table 2 (t-test analysis)

| | Full Treatment | | Total | |
|---|---|---|---|---|
| | Yes n=144 | No n=37 | n=181 | P-Value |
| Length of Stay (days) | 8 | 7 | 8 | 0.789 |
| 30 Day Readmission | 29 (20.1%) | 8 (21.6%) | 37 (20.4%) | 0.841 |
| Colectomy | 6 (4.2%) | 2 (5.4%) | 8 (4.4%) | 0.667 |
| ICU Admission | 35 (24.3%) | 14 (37.8%) | 49 (27.1%) | 0.098 |
| Diarrhea Resolved | 66 (61.1%) | 21 (75.0%) | 87 (64.0%) | 0.172 |

intensive care unit (ICU) admission, and diarrhea resolution on day of discharge. **Results:** Of the 181 patients, 144 received full treatment, 17 had partial, and 20 had no treatment. Baseline characteristics were similar between groups. No significant difference was found for length of stay or any secondary outcomes (Table 1). Table 2 provides a subgroup of patients who received no treatment vs those receiving partial or full treatment. **Conclusion:** In this study, treatment exposure did not affect clinical outcomes for patients with PCR+/EIA- results, though sample sizes may limit generalizability. Further research is warranted regarding the clinical approach to PCR+/EIA-

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**Impact of Clostridioides difficile Reporting on Antimicrobial Therapy Days Directed at Treatment of C. difficile Infections**

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**Background:** Previous studies have found that solely relying on molecular testing is likely to result in the overdiagnosis and overtreatment of C. difficile infections (CDI). Comparable outcomes have been demonstrated in patients with a positive molecular test (C. difficile PCR) result and a negative toxin immunoassay (C. difficile toxin) compared to patients without CDI by either testing **Method:** In 2021 Memorial Hermann Healthcare System converted from C. difficile PCR testing only to C. difficile PCR testing with reflex to C. difficile toxin if positive. A previous internal audit revealed that despite this change in testing, patients who were C. difficile PCR positive and C. difficile toxin negative were still receiving treatment. This study aimed to evaluate the impact of C. difficile reporting on the total days of therapy directed at the treatment of CDI of an 11-hospital health care system in patients who testing C. difficile PCR positive/C. difficile toxin negative. **Methods:** Pre-post, multicenter, retrospective, observational study conducted from January 1, 2023 through March 31, 2023 (pre-intervention) and July 1, 2023 through September 31, 2023 (post-intervention) which included hospitalized adult patients with a C. difficile test ordered within the study period. Intervention included a change in reporting of C. difficile PCR positive/C. difficile toxin negative results to display a laboratory comment. The comment notifies providers of the positive C. difficile PCR result while highlighting this probably reflects colonization with C. difficile as the C. difficile toxin is negative and treatment is rarely indicated. **Results:** In total, 989 C. difficile PCR were order in the pre-intervention cohort compared to 1009 in post-intervention. The overall rate of patients that received therapy directed at CDI decreased from 14% to 10% after the implementation of reporting change. Total days of therapy (DOT) also decreased by 29% from 482 to 342. Days of therapy that were administered to patients with C. difficile PCR positive/negative C. difficile toxin test decreased from 183 to 91. **Conclusions:** Adjusting the reporting of C. difficile results led to an overall numerical decrease of antimicrobial DOT directed at CDI treatment. In particular, among patients with a positive C. difficile PCR/C. difficile toxin negative test a 50% reduction in DOT was observed. Further data are required to assess the overall clinical impact of adjusting CDI reporting methods.

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**Audit and Feedback to Ordering Providers to Reduce Inappropriate C. difficile Testing and Hospital Onset C. difficile Rate**

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**Background:** Inappropriate Clostridioides difficile (C. difficile) laboratory testing is common in hospitals and leads to over diagnosis, unnecessary treatment, and elevated hospital onset C. difficile infection (HO-CDI) metrics. Diagnostic stewardship is essential to avoid inappropriate testing, but limited data exists on optional interventions. **Methods:** A diagnostic stewardship intervention targeting CDI testing comprised of education and prospective audit with feedback was performed a VA facility (inpatient, outpatient, and long-term care units). Education on appropriate indications for CDI testing was provided in pre-intervention (9/2022 to 5/2023) and intervention periods (6/2023 to 12/2023). During the intervention period, all CDI tests (positive or negative) were audited after completion in real-time by an Infectious Diseases physician and feedback was given to ordering providers and/or their supervising physician (if trainee) for all tests not meeting an appropriate indication. Appropriate indication was defined as ≥3 liquid stools in 24 hours or symptoms of fulminant disease. Testing was considered inappropriate if no clinical symptoms, patient received laxatives within 48 hours, test was performed for test-of-cure or within 7 days of a prior test with no clinical change, or delayed testing in patients with diarrhea on admission. The rate of HO-CDI per 10,000 bed days of care (BDOC) per LabID event was compared during the pre-intervention and intervention periods, and ordering appropriateness was compared for all tests and hospital onset tests before (3/2023-5/2023) and after (6/2023-12/2023) feedback was performed. **Results:** After starting audit and feedback, HO-CDI rate decreased from 3.92 per 10,000 BDOC to 0.99 per 10,000 BDOC (p=0.03). HO-CDI rate among tests that were inappropriate was 2.19 and 0.80 per 10,000 BDOC during the pre-intervention and intervention periods, respectively (p=0.40). Average overall tests per month decreased from 37.8 to 28.1 after the intervention. Rate of all inappropriate tests decreased from 16.25 to 7.96 per 10,000 BDOC (p=0.04) and rate of hospital onset inappropriate tests trended toward decrease from 9.29 to 4.77 tests per 10,000 BDOC (p=0.07). The most common reasons for inappropriate testing were < 3 episodes of diarrhea in 24 hours (54% pre-intervention, 65% intervention) and laxative use (57% pre-intervention, 45% intervention). No cases of delayed testing leading to worsened disease were identified during the intervention. Cost savings for decreased tests were estimated at $150-300 per month. **Conclusion:** An intervention comprised of education and real-time audit and feedback of all CDI tests obtained at a VA facility resulted in decreased inappropriate testing and reduced the rate of HO-CDI.

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**Leveraging the Electronic Medical Record in C. difficile Diagnostic Stewardship**

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**Background:** Clostridioides difficile PCR is extremely sensitive but cannot differentiate colonization versus active disease. Over diagnosis of C. difficile infection (CDI) has negative consequences including overuse of antibiotics targeting C. difficile, increased hospital-acquired (HA)-CDI rates, and increased healthcare costs. We describe the implementation of a Clinical Decision Support tool embedded in the C. difficile order and the result on testing, HA-CDI rates and healthcare costs. **Methods:** The C. difficile order was updated in June 2023 with 4 dynamic questions that