905142

DIAGNOSTIC STEWARDSHIP OF C DIFFICILE PCR TESTING WITH TWO STEP ALGORITHM- A RURAL COMMUNITY HOSPITAL EXPERIENCE

Raghavendra Tirupathi, MD, FACP; Ruth Freshman, MSN, RN, CIC
Norma Montoy, MLT(ASCP)CIC; Melissa Gross, PharmD, BCIDP
WellSpan Health Chambersburg Hospital, Chambersburg, Pennsylvania

Contact Information:
Address:
112 N. 7th St.
Chambersburg, PA 17201
Phone:
717-267-3000
Email:
tirupa@keystonehealth.org

Introduction

Clostridioides difficile (C. difficile) infection leads to 149 cases per 100,000 population resulting in 29,000 deaths per year in the United States. C. difficile is the most common healthcare-associated pathogen, and approximately two-thirds of CDI cases are healthcare associated.

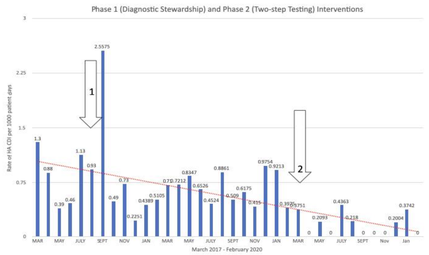
However, since an estimated 8%–15% of hospitalized patients are asymptomatic carriers of C. difficile, positive test results must be interpreted in the context of clinical symptoms. Inappropriate testing can lead to over-testing and diagnosis, inadvertent treatment and isolation, and to Lab ID events resulting in an increased incidence of hospital onset CDI (HO-CDI) with substantial financial penalties.

The 2018 IDSA and SHEA CDI clinical practice guidelines recommend not testing for CDI if a patient's diarrhea is clearly attributable to another cause, and they advise against testing patients who have recently received a laxative.

Laxatives are frequently prescribed in hospitalized patients, and several studies have indicated that 19%–44% of all C. difficile tests may be inappropriately ordered on patients receiving laxatives. This scenario provides an opportunity for improvement.

Background

- A rural 310-bed community hospital which historically has had a nurse-driven C. difficile test ordering protocol. Due to in-advertent test ordering, we had a significant uptick in the HO CDI incidence in which rates as high as 0.94 per 1000 patient days [average] in 2017 were observed as detailed in the graph below.



Methods and Implementation

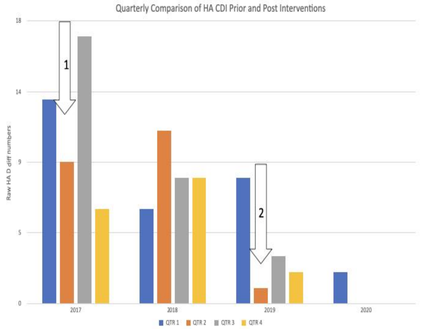
- In September 2017, a multidisciplinary team reviewed and initiated an algorithm based diagnostic stewardship of testing [IDSA and SHEA guidelines] with mandatory audit and review by infection preventionists (IP) under the guidance of the Infectious Disease (ID) physicians on all ordered tests.
- In phase 1, IPs reviewed the adequacy and legitimacy of order for multiple parameters including minimum 3 loose stools in 24 hours, use of laxatives in last 24 hours, consistency of the sample, presence of at least one of the parameters- fever/abdominal pain/leukocytosis/sepsis/septic shock, recent or concomitant antibiotic use, recent PCR testing in the last 14 days, and chart review for medical and surgical history.
- IPs rejected the samples deemed inappropriate for testing.
- Ambiguous cases were discussed with the ID specialist.
- Physicians were allowed to bypass the protocol and proceed with testing on a stat basis if they deemed necessary in critically sick.
- In the microbiology lab, all specimens sent were batched to be run twice a day on weekdays at 830am and 230pm with tests only processed on the cleared samples by the IPs .
- There were concerns nationally that then CDI risk adjustment model from NHSN in 2017 does not optimally account for the impact of specific CDI testing methods used by individual hospitals on CDI SIRs. Hence, in Jan 2018 NHSN's MDRO/CDI Protocol stated, "Results of the final test that are placed in the patient's medical record should be used to determine whether event meets the CDI LabID defn".
- This led to phase 2 in Mar 2019 which involved two step testing which started with C diff PCR assay with positive test reflexed to the toxin A/B assay.

Results

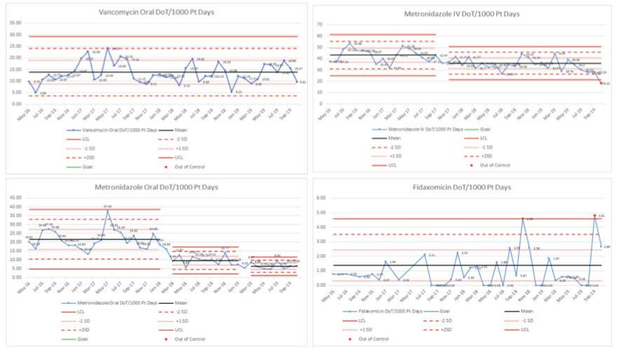
- The number of PCR tests completed in the comparison quarter of 2016 was 220 which decreased to 157 tests in 2017 with a reduction of 28%.
- After a full year of implementation of the Diagnostic Stewardship Protocol in 2018, the number of completed PCR tests decreased to 626 (compared to 940 PCR tests in 2016) with an overall 34% decrease in testing.
- In the year following implementation of the Diagnostic Stewardship, HO CDI decreased from 60 in 2017 to 43 events in 2018 with a reduction of 28%. Subsequently, HO CDI further decreased in 2019 from 43 to 28 with a reduction of 35%. Since the implementation of the project in 2017, HO CDI have decreased an overall of 54%.

Results

- The reduction in 314 C diff PCR tests in the first year[2017-2018] led to a savings of $8300 in laboratory testing supplies. The reduction of HO CDI by 17 led to a cost avoidance of $293,420.
- No readmissions with C difficile infection documented within 30 days on patients who did not meet the criterion for testing.
- Significant decrease in the usage of C difficile antibiotics
- HO CDI rate decreased from an average of 0.94 per 1000 patient days in 2017 to 0.43 per 1000 patient days in 2018.
- After the start of the two-step test, we have seen a precipitous drop in our HO-CDI rates to less than 0.3 per 1000 patient days by the end of 2019.



Results



Conclusion/Limitations

- IP-run diagnostic stewardship programs are highly successful in streamlining testing with a decrease in the incidence of HO-CDI, and with cost savings on several fronts including health care dollars saved due to a substantial decrease in the number of PCR tests ordered and a decrease in the utilization of C. difficile antibiotics.
- Diagnostic stewardship programs prevent unnecessary isolation of wrongly identified or colonized patients.
- We also hypothesize that IP-run stewardship programs are more efficient than the soft/hard stops created with best practice alert in the EMR since the IP intervention will provide a more real-time opportunity to interact with ordering team and provide feedback leading to a learning curve.
- Stewardship was limited to Monday to Friday when IPs were available to review records with weekends and holidays traditionally showing an increase in inappropriate testing.
- Our study once again emphasizes the valuable role of IPs and the need to invest in them as well as the department for overall improved outcomes.