**Background.** *Clostridioides difficile* infection (CDI) continues to be a major global public health concern, particularly during the ongoing SARS-CoV-2 coronavirus disease 2019 (COVID-19) pandemic. Despite new social distancing guidelines and enhanced infection control procedures (e.g., masking, hand hygiene) being implemented since the beginning of COVID-19, little evidence indicates whether these changes have influenced the prevalence of CDI hospitalizations. This study aims to measure CDI prevalence before and during the COVID-19 pandemic in a local cohort of U.S. Veterans.

**Methods.** This was a cross-sectional study of all Veterans presenting to the South Texas Veterans Health Care System in San Antonio, Texas from Jan 1, 2019 to Apr 30, 2021. Monthly laboratory confirmed CDI events were collected overall and categorized as the following: hospital-onset, healthcare facility-associated (HO-HCFA-CDI), community-onset, healthcare facility-associated CDI (CO-HCFA-CDI), and community-associated CDI (CA-CDI). Monthly confirmed COVID-19 cases were also collected. CDI prevalence was calculated as CDI events per 10,000 bed days of care (BDOC) and compared between pre-intervention (Jan 2019-Feb 2020) and pandemic (Mar 2020-Apr 2021) periods.

**Results.** A total of 285 CDI events, 920 COVID-19 cases, and 104,220 BDOC were included in this study. The overall CDI rate increased from 20.33 per 10,000 BDOC pre-pandemic to 34.51 per 10,000 during the pandemic (p<0.0001). This was driven primarily by a rise in CO-HCFA-CDI rates (0.95 vs 2.52 per 10,000 BDOC; p<0.0001) during the pandemic, followed by increases in CA-CDI (15.58 vs 18.61 per 10,000 BDOC; p<0.0001) and HO-HCFA-CDI (2.66 vs 5.43 per 10,000 BDOC; p<0.0001). Lastly, CDI rates have tripled since the start of the pandemic (March-April 2020) compared to the current year (March-April 2021) (14.69 vs 43.76 per 10,000 BDOC).

**Conclusion.** Overall, CDI prevalence increased during the COVID-19 pandemic, driven mostly by an increase in CO-HCFA-CDI. As COVID-19 rates increased, CDI rates also increased, likely due to greater healthcare exposures and antibiotic use. Continued surveillance of COVID-19 and CDI is warranted to further decrease infection rates.

**Disclosures.** All Authors: No reported disclosures

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**759. Impact of *Clostridioides difficile* (CD) Nucleic Acid Amplification Test (NAAT) Approval on Hospital-Onset *C. difficile* Infection (HO-CDI): A Diagnostic Stewardship Intervention.**

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**Session:** P-36. HAI: C. difficile

**Background.** NAAT is highly sensitive in detecting toxigenic CD but if used inappropriately can lead to overdiagnosis and financial penalties. Despite diligent infection control (IC) measures, HO-CDI rates at our hospital remained above target benchmarks. We implemented mandatory CD testing approval to decrease HO-CDI rates.

**Methods.** On 7/1/2019, we implemented CD testing approval for stool samples collected after admission day 3 in our 129-bed community hospital. An algorithm instructed providers about approval granted by IC 7 days-a-week. The micro-lab would not process samples unless pre-approved. We prospectively collected data on demographics, ICU, laxative, antibiotic use, CDI signs/symptoms, prior CDI and outcomes categorized as the following: hospital-onset, healthcare facility-associated (HO-HCFA-CDI), community-onset, healthcare facility-associated CDI (CO-HCFA-CDI), and community-associated CDI (CA-CDI). Monthly confirmed COVID-19 cases were also collected. CDI prevalence was calculated as CDI events per 10,000 bed days of care (BDOC) and compared between pre-intervention (Jan 2019-Feb 2020) and pandemic (Mar 2020-Apr 2021) periods.

**Results.** A total of 72 samples required CD testing authorization; 65 (90%) to 0.77 from 1.03. 

**Conclusion.** Overall, CDI prevalence increased during the COVID-19 pandemic, driven mostly by an increase in CO-HCFA-CDI. As COVID-19 rates increased, CDI rates also increased, likely due to greater healthcare exposures and antibiotic use. Continued surveillance of COVID-19 and CDI is warranted to further decrease infection rates.

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**Trends of CD testing and HO-CDI in the pre-intervention and post-intervention period.**

**Figure 1A. Trend of CDI testing after hospital day 3 in the pre-intervention period (January 2018 - June 2019) and post-intervention period (July 2019 - December 2020)**

**Figure 1B. Trend of HO-CDI incidence in the pre-intervention period (January 2018 - June 2019) and post-intervention period (July 2019 - December 2020)**

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**Table 1. Baseline characteristic and outcomes of patients that required *C. difficile* NAAT testing after day 3 of hospital admission between July 2019 and December 2020.**

| Variable | Total n=72 | HO-CDI n=4 | CO-CDI n=5 | CA-CDI n=3 | p-value
|----------|------------|-----------|-----------|-----------|---------|
| Age (years) | 67±2.5 | 67±2.5 | 67±2.5 | 1.00 (0.95,1.05) |
| Total length of stay (days) | 18±6.7 (17.1) | 19.5±20.5 | 18±16.5 | 1.00 (0.95,1.05) |
| Time of last stool (days) | 9±4.3 (7.3) | 13±12.9 | 9±8.6 | 0.99 (0.93,1.06) |
| Gender | | | | |
| Male | 50(69) | 30(75) | 15(60) | 1.00 (0.50,2.00) |
| Female | 22(31) | 5(13) | 5(20) | 0.40 (0.14,1.16) |
| Race | | | | |
| White | 42(59) | 36(90) | 2(8) | 1.00 (0.13,3.95) |
| Black | 30(42) | 4(10) | 0(0) | 0.00 (0.00,0.00) |
| Hispanic | 10(14) | 2(5) | 0(0) | 0.00 (0.00,0.00) |
| Other | 0(0) | 0(0) | 0(0) | 0.00 (0.00,0.00) |

**Conclusion.** Overall, CDI prevalence increased during the COVID-19 pandemic, driven mostly by an increase in CO-HCFA-CDI. As COVID-19 rates increased, CDI rates also increased, likely due to greater healthcare exposures and antibiotic use. Continued surveillance of COVID-19 and CDI is warranted to further decrease infection rates.

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Conclusion. CD testing approval is a successful strategy to optimize testing and lower HO-CDI rates, without resulting in worst outcomes even when CD test was not approved.

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760. Incidence, Predictors and 30-Day Outcomes of Clostridioides difficile Infection in Patients Undergoing Cystectomy: A Nationwide Analysis Using the ACS-NSQIP Database

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Session: P-36. HAI: C. difficile

Background. Clostridioides difficile infection is the second most common health care acquired infection (HAI) and the most common gastrointestinal HAI, with an estimated 350,000 cases reported by the CDC in 2017. CDI continues to remain a major cause of inpatient admission and utilization of healthcare resources. The exact incidence of peri-procedural CDI with cystectomy is unknown, and reported incidence of CDI in literature vary widely

Methods. We analyzed patients undergoing cystectomy between 2015 and 2017 using the ACS National Surgical Quality Improvement Program (NSQIP) to study the incidence, risk factors and 30-day post-surgical outcomes associated with CDI following cystectomy. Developed by the American College of Surgery, this is a nationally validated, risk-adjusted, outcomes-based program designed to determine and improve the quality of surgical and post-surgical care.

Results. The incidence of CDI following cystectomy was 3.6% in our patient cohort. 18.8% of patients developed CDI following hospital discharge. Non-elective surgeries, and complete cystectomy procedures had higher rate of CDI. 48.4% of patients with CDI had a preceding post-operative infection. Post-operative organ space infections (OR 1.95), post-operative renal failure (OR 2.38), post-operative sepsis (OR 2.49) and septic shock (OR 2.33) were independently associated with development of CDI, (all p-values <0.05). Patients who developed post-operative CDI during hospitalization had lengthier hospital admissions than those who did not develop a CDI (OR 2.29), and had a higher risk of DVT formation (2.48), and were also more likely to have unplanned readmissions (OR 7.8)

Conclusion. This is the first nationwide study looking at inpatient and 30-day post-operative CDI after cystectomy in the US. A sizable number of patients experience CDIs after cystectomy procedures, and CDI development is associated with an increase in length of stay and unplanned readmissions. This study lends further evidence to the need for continued interventions and initiatives to reduce this burden of post-operative CDI.

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761. Host Intestinal Defenses Against Clostridioides difficile Infection in Chemotherapy Patients

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Session: P-36. HAI: C. difficile

Background. Clostridioides difficile infection (CDI) is a common complication in patients undergoing cancer treatment with cytotoxic chemotherapy. Exposure to antibiotics or chemotherapy disrupts the microbiome by killing protective factors secreted by Paneth cells of the intestinal epithelium. One protective factor secreted by Paneth cells is lysozyme, an enzyme that degrades the cell walls of Gram-positive bacteria such as C. difficile. We hypothesized that chemotherapy-induced mucosal barrier injury and the resultant death of Paneth cells leads to decreased production of lysozyme. We thus sought to examine changes in lysozyme concentration in stool of chemotherapy patients.

Methods. We collected stool samples from six patients undergoing cancer treatment at four different time points. The first stool sample corresponded to the day prior to the start of chemotherapy (day zero). We then performed ELISA assays to determine the lysozyme concentration for each stool sample.

Results. On day zero, the lysozyme levels (n=6) averaged 268.1 ± 131.7 ng/mL. Over the course of chemotherapy, the lysozyme levels decreased 78.70 ± 24.19% from the starting value. The lowest values were observed around days 5 through 11 for most patients, coinciding with when they were most neutropenic around day 11. One of the patients developed CDI on day 5 and experienced more fluctuating lysozyme levels thereafter. On the day that the patient developed CDI, lysozyme was measured as 6.63 ng/mL. Throughout treatment, 3/6 patients showed recovery of lysozyme production with white blood cell recovery.

Conclusion. Our data indicate that chemotherapy causes decreased concentrations of lysozyme in stool. Low lysozyme levels could in part account for the increased susceptibility to CDI during chemotherapy. Future experiments will include bioinformatics analyses to determine how the microbiome changes in response to chemotherapy. Together, these experiments will inform our approach to determining patient susceptibility to chemotherapy-associated CDI.

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762. Real-World Utilization of C. difficile Drug Treatments and Associated Clinical Outcomes in a US Hospital System

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Session: P-36. HAI: C. difficile

Background. IDSA recommends use of fidaxomicin or oral vancomycin for treatment of initial episode or first recurrence of Clostridioides difficile infection (CDI). This study aimed to evaluate impact of a clinical decision support order set driving appropriate use of fidaxomicin on utilization of CDI drug treatments and associated clinical outcomes.

Methods. This was a retrospective, quasi-experimental study evaluating CDI therapies pre- (8/2016-11/2017) and post- (5/2018-1/2020) CDI order set implementation at a level-one trauma center located in Virginia. Admitted adult patients were included if CDI testing was positive for a 1st or 2nd episode and received active CDI treatment. Exclusions included fulminant CDI and CDI diagnosis by PCR with <3 bowel movements or laxative use within 24 hours. The primary outcome was CDI recurrence within 30 days of completing therapy in patients who achieved clinical cure. Secondary outcomes were evaluated at 30 and 90 days and included sustained response and CDI-related readmissions.

Results. After screening, 186 patients in the pre-group and 187 in the post-group were included. Median age was 68 [59-77], most patients had an initial CDI episode (88.2%) and were diagnosed with severe CDI (50.7%). Baseline characteristics were similar between each group on Charlson comorbidity index, ICU admission, CDI risk factors, and concomitant antibiotic use. Primary treatment options in the pre-group were mostly common metronidazole 47.9% and oral vancomycin 50.5%, and in the post-group were fidaxomicin 56.7% and oral vancomycin 41.7% (Figure 1). CDI recurrence rates at 30 days post-index medication (17.2% vs. 6.3%, p=0.004) were lower in the post-group (Table 1). Clinical cure (84.4% vs. 94.1%, p=0.002) and sustained response at 90 days (55.8% vs. 73.3%, p<0.001) were higher in the post-group. CDI recurrence rates at 90 days and CDI-related readmissions at 30 and 90 days were also lower in the post group.

Figure 1. CDI Treatment Utilization

Table 1. Clinical Outcomes

| Outcomes | Pre-Group (n=186) | Post-Group (n=187) | p-value |
|----------|------------------|--------------------|---------|
| Clinical Cure, n (%) | 157 (84.9%) | 170 (96.1%) | 0.002 |
| Recurrence, n (%) | 27 (17.2%) | 11 (6.3%) | 0.004 |
| Lysozyme 90-day | 39 (24.0%) | 24 (13.6%) | 0.003 |
| Sustained response at 90 days, n (%) | 104 (55.9%) | 137 (73.5%) | <0.001 |
| CDI-related readmissions, n (%) | 21 (11.3%) | 8 (4.3%) | 0.006 |
| All-cause readmissions, n (%) | 38 (20.8%) | 30 (16%) | 0.021 |

* Recurrence was assessed only in patients with clinical cure (i.e., denominator = 157 for pre-group and 170 for post-group)

* Patients with incomplete follow-up were not evaluated for outcomes unless they had the outcome prior to end of available follow-up

Conclusion. Implementation of the CDI order set increased fidaxomicin use and was associated with a decrease in CDI recurrences and CDI-related readmissions and no increase in clinical cure and sustained response. Findings suggest increased first-line use of fidaxomicin results in better clinical outcomes.