

Presentation Type:

Poster Presentation - Poster Presentation

Subject Category: C. difficile

Clinician Interpretation and Management of Discordant PCR+/Toxin-Clostridioides difficile Testing Results Post-COVID

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Background: Our institution utilizes a two-step algorithm consisting of an initial polymerase chain reaction (PCR) test with positive results reflexed to an enzyme immunoassay (EIA) for toxin. Institutional guidelines implemented during the COVID-19 pandemic recommended applying clinical judgment to patients with PCR+/Toxin- (discordant) results when determining if treatment is indicated. Pre-pandemic, we found that clinicians continued CDI-directed therapy in 56% of patients following the Toxin-result. Our study aims to identify how clinicians interpret PCR+/Toxin- results and reasons for management decisions post-pandemic. **Methods:** At an academic medical center, we conducted a retrospective cohort study of the first 50 inpatient charts with PCR+/Toxin- results from August to October 2022. Data was abstracted from clinical, pharmacy, and microbiology databases. The primary outcome was the proportion of patients continued on CDI-directed therapy for ≥24 hours after the Toxin- result became available. Secondary outcomes included the proportion of patients prescribed a full treatment course for CDI and the reasons for continuing treatment. **Results:** There were 37 patients (74%) who started CDI-directed treatment after initial PCR+ **Results:** Of these patients, 59% (22/37) were continued on treatment for ≥24 hours after the Toxin- result (primary outcome). 77% (17/22) of these patients who met the primary outcome completed full treatment courses. Three patients were transitioned to prophylaxis dosing after the Toxin- result. The most common reason for continuing treatment after discordant results was high clinical suspicion for CDI (Figure). There were no CDI-related complications in this 50-patient cohort. In immunocompromised patients, 70% (16/23) started treatment after initial PCR+ results and 81% (13/16) met the primary outcome. In patients admitted specifically to immunocompromised inpatient services, 90% (9/10) started treatment after initial PCR+ results and 100% (9/9) met the primary outcome. **Conclusion:** The majority of patients started on treatment after the PCR+ result were continued on treatment following the Toxin- result, though several of these patients did not complete full treatment courses. Treatment rates were similar to our pre-pandemic baseline. When patients were continued on treatment after discordant results, clinicians cited appropriate high clinical suspicion. Notably, every patient admitted to an immunocompromised service was continued on treatment after Toxin- **Results:** Overall, clinicians are following institutional guidelines by applying clinical judgement when interpreting discordant **Results:** Further research will help identify what variables affect clinician interpretation and management practices for discordant

results, which will help shape institutional guideline updates, clinician education, and additional stewardship interventions.

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Hospital-Onset Clostridioides difficile infection in chronic kidney disease patients

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Introduction: Hospital-onset Clostridioides difficile infection (HO-CDI), reported as laboratory-identified (LabID) event, is common in patients with chronic kidney disease (CKD), especially those with end-stage renal disease (ESRD), and is associated with prolonged length of hospitalization and more severe disease. CKD patients are at increased of developing CDI due to frequent antimicrobial and healthcare exposures. The objective of this study was to assess recent trends of HO-CDI in patients on a nephrology unit at our academic, tertiary care institution. **Methods:** Retrospective cross-sectional study of patients with HO-CDI who were hospitalized on a nephrology unit between January 2021 to December 2023. Collected variables included: demographic data, characterization of HO-CDI risk factors, infection and diagnosis (including prior history of CDI, toxin versus nucleic acid amplification test [NAAT] positivity, number of loose stools), CDI rate (defined as CDI count/patient days x1000), standardized antimicrobial administration ratio (SAAR) for high-risk for CDI antimicrobials (defined by the National Healthcare Safety Network), and infection prevention and control (IPC) practices, including hand hygiene audit rates. **Results:** A total of 30 HO-CDI infections were reported on the nephrology unit [Table], with 8 occurring in 2021, 5 in 2022, and 17 in 2023. The median age of patients was 70.8 (range: 37-96) years, and most patients (57%) were female. The majority of patients were admitted from home (73%), and two patients (7%) had a history of CDI in the last 6 months. Among the CDI cases, 60% were NAAT positive and toxin negative, and only 50% had >3 bowel movements (BM) within 24 hours prior to the positive test. Ten percent received promotility agents prior to testing. Most cases (77%) occurred when other CDI patients were on the unit. Hand hygiene compliance rates averaged 81% over the three-year period [Figure 1A]. Eight-four per cent of patients received antibiotics within 30 days of CDI diagnosis; SAAR was >1 for quarters 2 and 4 in 2022, and quarter 1 in 2023 [Figure 1B]. **Conclusion:** On our nephrology unit, patients often had < 3 BM within 24 hours of CDI diagnosis, and 60% of cases were toxin-negative, NAAT-positive, suggesting possible C. difficile colonization, rather than true infection. In addition, an elevated SAAR

Figure. Reasons for Continuing C. difficile Treatment after PCR+/Toxin- Result (N = 25)

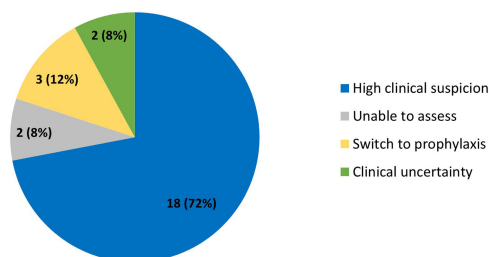


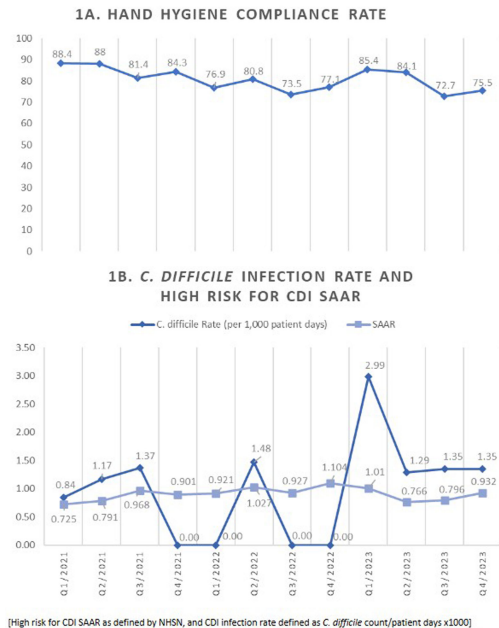
Table 1. Demographic and CDI-related data among patients hospitalized on nephrology unit from 2021-2023

| CDI-Related Data | 2021 | 2022 | 2023 | Total |
|---|---------------------|---------------------|---------------------|---------------------|
| Total number of HO-CDI | 8 | 5 | 17 | 30 |
| Median age, years | 76.9 (range: 41-84) | 73.2 (range: 69-88) | 68.1 (range: 37-96) | 70.8 (range: 37-96) |
| Gender (female) | 5 (63%) | 3 (60%) | 9 (53%) | 17 (57%) |
| Admitted from | | | | |
| - Home | 6 (75%) | 3 (60%) | 13 (76%) | 22 (73%) |
| - Skilled nursing facility | 1 (12.5%) | 1 (20%) | 1 (6%) | 3 (10%) |
| - Outside hospital | 1 (12.5%) | 1 (20%) | 3 (17.6%) | 5 (17%) |
| History of CDI in the last 6 months | 1 (12.5%) | 1 (20%) | 0 | 2 (7%) |
| C. difficile test result* | | | | |
| - Toxin-positive | 6 (75%) | 1 (20%) | 4 (24%) | 11 (37%) |
| - Toxin-negative, NAAT-positive | 2 (25%) | 4 (80%) | 12 (76%) | 18 (60%) |
| Cases with >3 BM within 24 hours prior to positive test | 7 (88%) | 3 (60%) | 5 (35%) | 15 (50%) |
| Infection Prevention and Control practices | | | | |
| - Rooms that had a prior CDI case | 0 | 1 (20%) | 3 (18%) | 4 (13%) |
| - Cases where another CDI patient was on the unit | 7 (87.5%) | 4 (80%) | 12 (71%) | 23 (77%) |
| - Cases with delay in isolation and testing | 0 | 0 | 1 (6%) | 1 (3%) |
| Cases with antibiotics received within < 30 days of CDI | 7 (88%) | 4 (80%) | 14 (82%) | 25 (84%) |
| Hard-stop override by IPC Medical Director* | 0 | 1 (20%) | 2 (6%) | 3 (10%) |
| Cases that died | 0 | 0 | 0 | 0 |

HO-CDI = Hospital-onset Clostridioides difficile infection, NAAT=nucleic acid amplification test
 *At our institution, CDI diagnosis is established via stepwise algorithm of stool testing initially by GDH and toxins A and B by EIA, then reflexed to NAAT testing for toxin B gene in cases of discordant results.

*Hardstop override: defined as a case reviewed by Infection Prevention and Control Medical Director prior to CDI testing due to patient having had inpatient exposure to promotility agents.

Figure 1. (A) Hand hygiene compliance rate and (B) *C. difficile* infection (CDI) rate, high risk for CDI standardized antimicrobial administration ratio (SAAR) for nephrology unit from 2021-2023



[High risk for CDI SAAR as defined by NHSN, and CDI infection rate defined as *C. difficile* count/patient days x1000]

correlated with high CDI rates. Multicomponent interventions may be required to reduce the rates of HO-CDI in CKD patients. Opportunities include emphasis on diagnostic and antimicrobial stewardship, environmental cleaning and adherence to IPC practices, including hand hygiene.

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Factors Associated with Inappropriate Urine Culture Orders in Hospitalized Patients with Indwelling Urinary Catheters

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Background: Catheter-associated urinary tract infection (CAUTI) is among the most prevalent healthcare-associated infections. Clinical diagnosis of CAUTI and National Healthcare Safety Network (NHSN) definitions do not always align. Most patients with indwelling urinary catheters ultimately develop asymptomatic bacteriuria (ASB) due to bacterial colonization and may be misattributed as CAUTI. Urine cultures ordered on patients with ASB may lead to reporting of non-clinically significant CAUTI to NHSN. We sought to examine factors associated with ordering inappropriate urine cultures in patients with urinary catheters. **Methods:** All CAUTIs that were reported to the NHSN at a large academic medical center in Eastern North Carolina were evaluated from October 2021-July 2023. A logistic regression model was fit for patients treated for urinary tract infection (UTI) with the following covariates: age, sex, time of urine culture order, provider type, and days that the urinary catheter was in place. All data analysis was performed in SAS (SAS Institute Inc., SAS 9.4, Cary, NC: SAS Institute Inc., 2002-2023). **Results:** Table 1 demonstrates patient characteristics stratified by treatment for UTI. The analysis suggests that abnormal results from urine cultures ordered overnight were less likely to be treated with antibiotics, and this result was statistically significant in both the adjusted and unadjusted analyses – see table 2 and 3. The model also suggests abnormal results from urine cultures ordered by housestaff and older patients were more likely to be treated for UTI, but these results were not statistically significant – see table 3. Finally, the longer a catheter was in place the less likely an abnormal urine culture

Table 1: Patient characteristics.

| | Treated for UTI | Not Treated for UTI | n |
|--------------------------------|-----------------|---------------------|----|
| Male Sex | 53 (77.9%) | 15 (22.1%) | 68 |
| Female Sex | 41 (85.4%) | 7 (14.6%) | 48 |
| Average Age | 62 | 54.7 | - |
| Average WBCs/HPF | 112.5 | 104.7 | - |
| Average days catheter in place | 7 | 13.9 | - |
| Dayshift Culture Order | 78 (86%) | 13 (14%) | 91 |
| Nightshift Culture Order | 16 (64%) | 9 (36%) | 25 |
| Attending Ordered | 21 (81%) | 5 (19%) | 26 |
| Midlevel Ordered | 33 (73%) | 12 (27%) | 45 |
| Resident Ordered | 40 (89%) | 5 (11%) | 45 |
| Insertion | 44 (85%) | 8 (15%) | 52 |
| Maintenance | 50 (78%) | 14 (22%) | 64 |
| ID Consulted | 8 (8.5%) | 86 (91.5%) | 94 |
| ID Not Consulted | 7 (31.8%) | 15 (68.2%) | 22 |
| Foley Buddy | 73 (78.5%) | 20 (21.5%) | 93 |
| No Foley Buddy | 14 (93.3%) | 1 (6.7%) | 15 |

Table 2: Unadjusted logistic regression model for time of day of urine culture order (dayshift 7am-6pm, nightshift 6pm-7am).

| | OR | 95% CI | p-value |
|--------------------|------|-----------|---------|
| Night Shift orders | 0.30 | 0.11-0.81 | 0.02* |

Table 3: Results of adjusted logistics regression model.

| | OR | 95% CI | p-value |
|------------------------|------|------------|---------|
| Night Shift orders | 0.21 | 0.061-0.74 | 0.01* |
| Midlevel orders | 0.73 | 0.19-2.8 | 0.65 |
| Housestaff orders | 1.4 | 0.31-6.6 | 0.65 |
| Male Sex | 0.65 | 0.21-2.1 | 0.47 |
| Age | 1.03 | 1.0-1.06 | 0.05 |
| Days catheter in place | 0.89 | 0.83-0.96 | 0.003* |

was to be treated and this finding was statistically significant – see table 3. **Conclusion:** Cultures that did not prompt antimicrobial treatment did not impact patient care decisions and could be considered as inappropriate orders. This can result in CAUTIs reported to NHSN that were not clinically significant. Abnormal results from cultures that were ordered by the overnight team were less likely to be treated for clinical UTI and this may represent an important target for diagnostic stewardship interventions.

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Does Urinary Catheter Replacement Prior To Obtaining Urine for Culture Make a Difference?

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Background: Indwelling urinary catheters (UCs) generate biofilm that grows over time, raising concern that after several days any culture from