Table 1. Diagnostic assay results of study participants.

Diagnosis (Initial NAAT)	Patient Number	Bacterial Culture Result	enolase NAAT	tcdA NAAT (isolate)	tcdB NAAT (isolate)	cdtB NAAT	Clinical GeneXpert (NAAT) Result	Cytotoxicity Result	EIA Result	MSD Toxin A Results	MSD Toxin B Results
Positive	Patient 1	+	+	+	+	-	+	+	+	+	+
Positive	Patient 2	-					+	-	-	+	-
Positive	Patient 3	+	+	+	+	-	+	-	-	+	-
Positive	Patient 4	+	+	+	+	-	+	-	-	-	+
Positive	Patient 5	-					-	-	-	-	-
Positive	Patient 6	+	+	+	+	-	+	+	+	+	+
Positive	Patient 7	+	+	+	+	-	+	-	-	+	+
Positive	Patient 8	-					+	+	-	-	+
Positive	Patient 9	-					-	-	-	+	-
Positive	Patient 10	-					-	-	-	-	-
Positive	Patient 11	-					-	+	-	-	+
Positive	Patient 12	+	+	+	+	-	+	+	-	+	+
Positive	Patient 13	-					-	-	-	-	-
Positive	Patient 14	-					-	-	-	-	-
Positive	Patient 15	-					+	+	-	+	+
Positive	Patient 16	-					-	-	-	-	-
Positive	Patient 17	+	+	+	+	-	+	-	-	-	-
Positive	Patient 18	+	+	+	+	-	+	-	-	+	+
Positive	Patient 19	-					+	+	-	+	+
Positive	Patient 20	-					-	-	-	-	-
Positive	Patient 21	+	+	+	+	+	+	+	-	+	+
Positive	Patient 22	-					+	-	-	+	-
Positive	Patient 23	+	+	+	+	+	+	-	-	-	+
Negative	Patient 24	-					-	-	-	-	-
Negative	Patient 25	-					-	-	-	-	-
Negative	Patient 26	-					-	-	-	-	-
Negative	Patient 27	-	+	-	-	-	-	-	-	-	-
Negative	Patient 28	-					-	-	-	-	-
Negative	Patient 29	-					-	-	-	-	-
Negative	Patient 30	-					-	-	-	-	-
Negative	Patient 31	-					-	-	-	-	-
Negative	Patient 32	-					-	-	-	-	-
Negative	Patient 33	-					-	-	-	-	-
Negative	Patient 34	-					-	-	-	-	-
Negative	Patient 35	-					-	-	-	-	-
Negative	Patient 36	-					-	-	-	-	-
Negative	Patient 37	-					-	-	-	-	-
Negative	Patient 38	-	+	-	-	-	-	-	-	-	-
Negative	Patient 39	-					-	-	-	-	-
Negative	Patient 40	-					-	-	-	-	-
Negative	Patient 41	-					-	-	-	-	-
Negative	Patient 42	-					-	-	-	-	-
Negative	Patient 43	-					-	-	-	-	-
Negative	Patient 44	-					-	-	-	-	-

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2360. Impact of a Two-Step Antimicrobial Stewardship Intervention on *C. difficile* Infection Diagnosis at an Urban Veteran's Affairs Medical Center

Ryan T. Kuhn, PharmD, BCIDP, BCPS-AQID, AAHIVP[1];
Jennifer L. Johnson, BSN, RN[2]; Virginia Nelson, RN[3];
Dustin Fitzpatrick, BSN-RN[4]; Syed Ahmad, MD[5];
Sylvia Whittington, RN-CCM, MPH, MSN[3]; Sorabh Dhar, MD[6]; [1]John D. Dingell VA Medical Center, Ferris State University College of Pharmacy, Detroit, Michigan; [2]John D. Dingell, VAMC, Brownstown, Michigan; [3]John D. Dingell VAMC, Detroit, Michigan; [4]Wayne State, Detroit, Michigan; [5]Wayne State University, John D. Dingell VAMC, Detroit Medical Center, Detroit, Michigan; [6]Detroit Medical Center, Wayne State University, John D Dingell VA medical center, Detroit, Michigan

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Background. *C. difficile* infection (CDI) is a common healthcare-associated infection and quality measure for hospitals. Diagnosis of CDI is challenging as testing modalities, i.e., nucleic acid amplification test (NAAT), are highly sensitive but cannot differentiate between colonization and infection. Therefore, judicious use of testing is critical to avoid unnecessary diagnosis and treatments.

Methods. This single-center, retrospective chart review evaluated the impact of a two-step diagnostic stewardship intervention on *C. difficile* diagnosis and use of oral vancomycin in the inpatient setting. For the first step of the intervention, providers were educated on appropriate diagnosis and treatment, and given access to an optional electronic CDI clinical decision support system (CDSS). For the second step of the intervention, the CDI NAAT stand-alone testing option was removed from the lab ordering menu and providers were required to use the CDSS to order testing. Clinical data including bed-days of care (BDOC), total number tests ordered, number of positive tests and use of oral vancomycin was collected for the pre-intervention period (1/1/16 – 3/31/17), post intervention period 1 (April 1, 2017–October 31/18) and post-intervention period 2 (November 1, 2018–March 31, 2019).

Results. Compared with the pre-intervention group, there were no significant differences in the number of total CDI NAATs ordered, positive CDI NAATs or vancomycin DOT/10,000 BDOC in post-intervention group 1. There was a reduction in the number of total CDI NAATs ordered (341 vs. 42 [87.7%]) and the number of positive CDI NAATs (56 vs. 7 [87.5%]) in post-intervention group 2, respectively. When this data were normalized based on bed days of care (BDOC), there were still significant reductions in NAATs ordered and number of positive CDI NAATs (64 vs. 27 [57.8%]; 11 vs. 5, respectively, [54.5%]) and with vancomycin oral DOT/10,000 BDOC (72 vs. 7 [90.3%]) (Table 1).

Conclusion. Provider education and an optional CDSS did not significantly impact CDI NAAT ordering or use of oral vancomycin for CDI. However, implementation of a mandatory CDSS for CDI testing was shown to significantly decrease the number of tests ordered, the number of positive tests, and the use of oral vancomycin.

Table 1: CDI NAATs[1], Vancomycin DOT[2]/10,000 BDOC[3]: Pre-Intervention vs. Post Intervention Periods 1&2

Groups / Dates	BDOC (days)	Total NAATs	Positive NAATs	Total NAATs/10,000 BDOC	Positive NAATs/10,000 BDOC	Vancomycin Oral DOT/10,000 BDOC
Pre-Intervention Group: 1/1/16 to 3/31/17	53,015	341	56	64	11	72
Post Intervention Period 1: 4/1/17 - 10/31/18	61,048	362	70	59	11	62
Post Intervention Period 2: 11/1/18 - 3/31/19	15,445	42	7	27	5	7

1. *C. difficile* infection nucleic acid amplification test
2. Days of Therapy
3. Bed Days of Care

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

2361. Evaluation of a 2-Step Testing Algorithm for *Clostridioides difficile* Infection

Patricia Zuccaro, MD; Andrea Son, PharmD; Jennifer Conti, RN;
Michelle Hecker, MD; MetroHealth Medical Center, Cleveland, Ohio

Session: 250. HAI: *C. difficile* - Diagnostic Testing
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Background. Clinical data describing use of a multistep algorithm for diagnosis of *Clostridioides difficile* infection (CDI) is limited. In June 2018 we implemented a 2-step testing algorithm in which PCR testing (Aries® assay) is performed for all specimens followed by EIA toxin testing (TOX A/B QUIK CHEK® assay) when PCR is positive. We sought to describe outcomes for patients with PCR+/EIA+ vs. PCR+/EIA– results. Outcomes evaluated included frequency of CDI treatment, retesting and retreatment within 3 months, and investigator determined categorization of *C. difficile* results by an investigator blinded to the EIA result.

Methods. A retrospective cohort study was performed on a random sample of 85 unique patients with a PCR+ stool sample from July 2018 through December 2018. Demographic and clinical data were abstracted from the medical record during the index encounter and for 3 months thereafter. Based on predetermined criteria, index encounter results were categorized as representing probable, possible, unlikely, or indeterminate cases of symptomatic CDI.

Results. For the 85 study patients, 42%, 27%, and 31% were tested in the inpatient, outpatient, and ED/urgent care settings. Twenty-seven patients (32%) were EIA+, all of whom received CDI treatment. Fifty-eight (68%) were EIA-, of which 79% received treatment. Of the 12 EIA- patient who did not receive treatment two had retesting within 3 months; one of whom subsequently tested EIA+ and was treated and the other tested PCR-. At least 1 *C. difficile* test was repeated within 3 months in 48% of EIA+ and 33% of EIA- patients. Based on repeat testing CDI treatment was prescribed for 12% of EIA+ subjects and for 11% of EIA- subjects. For the EIA+ patients, 70%, 19%, 7%, and 4% were classified as probable, possible, unlikely and indeterminate cases of symptomatic CDI when compared with 38%, 34%, 22%, and 5% for EIA- patients.

Conclusion. During the first 6 months of a 2-step testing algorithm, we found that patients with EIA- test results were frequently treated for CDI and that 72% of EIA- cases were classified as probably or possibly having symptomatic CDI. Further study is needed to determine whether patients with EIA- results categorized with probable or possible symptomatic CDI would improve without CDI treatment.

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

2362. Back to the Future: The Impact of Multi-Step Algorithm *C. difficile* Testing at a Large Tertiary Medical Center

Jacqueline Bork, MD[1]; Kimberly C. Claeys, PharmD[2];
J. Kristie Johnson, PhD, D(ABMM)[3]; Jennifer Jones, BSN[4];
Uzoamaka Obiekwe, BSN[4]; Martha Lusby, BSN[4];
Emily Heil, PharmD, BCIDP[5,6]; Surbhi Leekha, MBBS, MPH[7]; [1]VA Maryland Health Care System, Baltimore, Maryland; [2]University of Maryland School of Pharmacy, Baltimore, Maryland; [3]Department of Pathology, University of Maryland, Baltimore, Maryland; [4]University of Maryland Medical Center, Baltimore, Maryland; [5]School of Pharmacy, University of Maryland, Baltimore, Maryland; [6]University of Maryland Medical Center, Baltimore, Maryland; [7]University of Maryland Dept of Epidemiology and Public Health, Baltimore, Maryland

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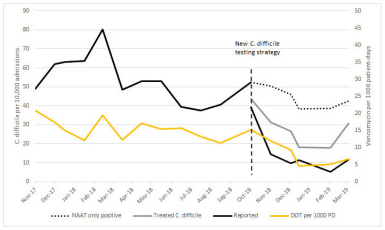
Background. Antibiotic stewardship and infection control programs rely on *C. difficile* infection (CDI) test results to measure CDI incidence in the hospital setting. *C. difficile* carriage is common and distinguishing infection from colonization is difficult with the highly sensitive nucleic acid amplification testing (NAAT) commonly used. Current guidelines recommend a multi-step algorithm for testing. The impact on patient outcomes and CDI metrics are largely unknown.

Methods. This was a pre-post study at the University of Maryland Medical Center, evaluating the impact of a CDI testing strategy (introduced October 2018) that simultaneously reported NAAT and confirmatory enzyme immunoassay (EIA) when used with existing best practice alerts for appropriate testing. Pre-intervention (November 2017–September 2018) and post intervention (October 2018–March 2019) periods were compared for mean CDI incidence (CDI per 10,000 admissions) defined by: (1) positive NAAT, (2) reported CDI (last positive test), and (3) treated CDI (receiving oral vancomycin). Both community and hospital-onset cases were included. The NAAT CDI incidence was used as the pre-intervention comparison for all 3 measures. In addition, oral vancomycin days of therapy (DOT) per 1,000 patient-days (PD) was compared. Pre–post comparisons of mean CDI incidence and mean DOT rates were done using Student t-test.

Results. There were 3,237 samples tested (2,269 pre and 968 post-intervention) with 376 NAAT positive (262 pre and 114 post-intervention). Of the 99 tests with reflex EIA, there were 74 discordant tests (NAAT +/EIA -) with 35 (47%) treated for CDI. Mean NAAT CDI incidence pre-intervention was 54 per 10,000 admissions. Post-intervention mean CDI incidence decreased as follows: 45 NAAT CDI per 10,000 admissions (P = 0.13), 15 reported CDI per 1000 admissions (P < 0.0001), and 28 treated CDI per 10,000 admissions (P = 0.0007). Oral vancomycin DOT per 1,000 PD decreased from 16 to 9 (P = 0.0002).

Conclusion. *C. difficile* NAAT testing with confirmatory EIA, in combination with best practice alert, decreased reported and treated cases of CDI, which may distinguish infection vs. colonization and avoid unnecessary treatment, beyond that achieved with alerts that improve appropriate patient selection for testing.



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

2363. Implementation of a Multi-Step Diagnostic Algorithm for *C. difficile* Infection

Morgan Walker, MD[1]; Miranda Mitchell, MD[1]; Britney Mellor, PharmD, BCPS[2]; Suzanne Buras, MT, ASCP[2]; Monica Young, RN[2]; Catherine S. O'Neal, MD[3]; [1]LSUHSC Baton Rouge Internal Medicine, Baton Rouge, Louisiana; [2]Our Lady of the Lake, Baton Rouge, Louisiana; [3]Louisiana State University Health Baton Rouge, Baton Rouge, Louisiana

Session: 250. HAI: *C. difficile* - Diagnostic Testing
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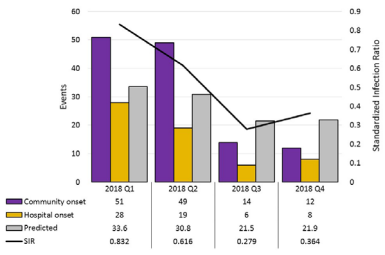
Background. The diagnosis of *C. difficile* infection (CDI) in the hospital is challenging asymptomatic colonization rates vary between 3% and 26%. Guidelines recommend multistep testing for CDI diagnosis. On July 1, 2018 a two-step testing algorithm was implemented at our institution. Positive nucleic acid amplification test (NAAT) results reflexed to a toxin enzyme immunoassay (EIA) test. The EIA test result was then used for NHSN reporting; however, both test results were visible to the clinician. Updated guidance on the interpretation of the test and treatment of CDI was released to the medical staff in July. We compared the incidence of CDI lab ID events per 1000 patient-days and the rate of *C. difficile* antibiotic starts before and after the implementation of the testing algorithm.

Methods. A retrospective observational study was performed at an 800 bed regional medical center. CDI lab ID events between January 1 and December 31, 2018 were reviewed. Antibiotic initiation of intravenous (IV) and oral (PO) metronidazole and PO vancomycin was collected for all hospitalized patients diagnosed with *C. difficile*. The incidence of hospital onset (HO) and community-onset (CO) lab ID events as well as the rate of antibiotic starts were compared before and after implementation of the algorithm using a two-sided z test for proportions with an alpha of 0.05.

Results. The incidence of HO and CO lab ID events per 1000 patient-days decreased significantly from 0.56 to 0.16 (P < 0.0001) and 1.18 to 0.3 (P < 0.0001) after implementation of the testing algorithm (Figure 1). The CDI SIR decreased from 0.729 to 0.322, (P = 0.0048). The rate of antibiotic starts per 1,000 patient-days for IV and PO Metronidazole decreased significantly from *1.1* to 0.45 (P < 0.0001) and *0.86* to *0.35* (P < 0.0001), respectively. PO Vancomycinstarts decreased from *1.51* to 1.23 (P = 0.11) (Table 1).

Conclusion. A two-step algorithm for diagnosing CDI decreases the overall number of HO and CO *C. difficile* lab ID events and decreases overall antimicrobial use for CDI.



	2018 Q1-Q2	2018 Q3-Q4	
PO Vancomycin			
Antibiotic starts, n	128	106	
Antibiotic starts/1000 patient-days	1.51	1.23	*p = 0.11*
IV Metronidazole			
Antibiotic starts, n	93	39	
Antibiotic starts/1000 patient-days	1.1	0.45	*p <0.0001*
PO Metronidazole			
Antibiotic starts, n	73	31	
Antibiotic starts/1000 patient-days	0.86	0.35	*p <0.0001*
IV + PO Metronidazole			
Antibiotic starts, n	166	70	
Antibiotic starts/1000 patient-days	1.96	0.81	*p <0.0001*

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

2364. Surprising Prescribing: Treatment Practices following Addition of Toxin Testing to an Existing Molecular Test for *Clostridioides difficile*

Ryan Miller, DO; Jose A. Morillas, MD; Thomas G. Fraser, MD; Kyle D. Brizendine, MD; Cleveland Clinic Foundation, Cleveland, Ohio

Session: 250. HAI: *C. difficile* - Diagnostic Testing
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Background. Diagnosis of *Clostridioides difficile* infection (CDI) is problematic. Adding toxin enzyme immunoassay (EIA) to molecular tests may differentiate disease from colonization and reduce treatment. Detailed descriptions of prescribing patterns following the introduction of EIA testing are not well characterized, particularly in PCR+/ EIA– patients.

Methods. In June 2018, Cleveland Clinic added EIA testing to PCR+ specimens. We conducted a retrospective cohort study on all adult inpatients who were PCR+/ EIA- from June–December 2018. Patients were placed into 3 groups for comparison: (1) complete treatment (guideline concordant); (2) incomplete treatment; and (3) no treatment. Associations with prescribing complete treatment were determined.

Results. We identified 240 patients (Figure 1). Mean age was 60 years, and 122 (51%) were female. Baseline conditions included many high severity comorbidities (Figure 2). 38 (16%) had history of prior CDI. 110/ 240 (46%) patients were receiving concomitant systemic antibiotics. 173 (72%) patients received complete CDI treatment, 41 (17%) incomplete treatment, and 26 (11%) none. 158/ 173 (91%) were prescribed vancomycin amounting to 2,107 days of therapy, averaging 13 PO vancomycin days each. Hematologic malignancy (P = 0.03) and leukocytosis > 15,000/ mm^3 (P = 0.04) were significantly associated with complete treatment whereas Infectious Disease (I.D.) consultation was associated with not prescribing complete treatment (P = 0.001). Prior CDI was also associated with not prescribing complete treatment but did not reach statistical significance due to small sample with prior CDI (P = 0.09). There was no association with concomitant systemic antibiotic use or use in the past 1 month.

Conclusion. In the first 6 months after adding toxin EIA to an existing molecular test for CD, 89% of PCR+/ EIA– patients were prescribed some treatment. Hematologic malignancy and leukocytosis were associated with treatment. I.D. consultation was associated with not prescribing treatment. Although we suspect a learning curve with the 2-step approach to testing, it appears the challenge of optimizing testing and management remains. Improved understanding of the clinical significance of a sensitive test on a non-sterile specimen is required.

Figure 1. Flowchart depicting results of *C. difficile* testing and treatment at the Cleveland Clinic, June–December 2018