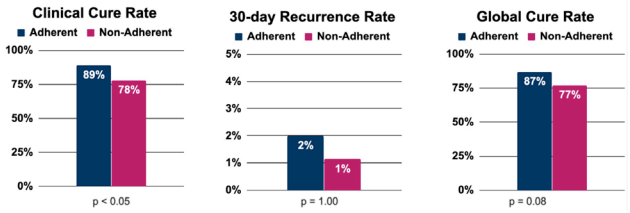
Figure 1. Rates of Clinical Cure, 30-day Recurrence, and Global Cure of *C. difficile* Infection



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

1984. A Multi-Disciplinary Team-based Quality Improvement Initiative to Reduce *Clostridioides difficile* Rates and Promote Antimicrobial Stewardship in Targeted Surgical Wards

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Background. At Stanford, two surgical wards, E3 and F3, were responsible for 1/5 of hospital-acquired *Clostridioides difficile* infection (HO CDI) cases in the fiscal year 2018 (FY2018). We used a quality improvement framework with a goal to reduce yearly HO CDI episodes by 1/2 on these wards.

Methods. A multidisciplinary quality improvement team was created with front-line nursing leaders and representatives from colorectal surgery, gynecology oncology, antimicrobial stewardship (ASP), infection prevention, and pharmacy. Coaching and instruction on quality improvement were provided as part of Stanford's "Realizing Improvement through Team Empowerment" (RITE) program. Using A3 problem solving, root cause analysis identified key drivers, and interventions were performed. Cumulative HO CDI cases in FY2019 and weekly antibiotic days of therapy (DOT) on E3/F3 were monitored.

Results. Review of FY2018 HO CDI cases (n = 14) revealed the most common key driver as inappropriate antibiotic prescribing (8 cases, 57%). Multiple interventions were instituted (Figure 1). Three ASP interventions began February 2019: nursing questioned antibiotic choice/duration on daily interdisciplinary rounds (Figure 2), automatic infectious disease consultation for > 72 hours of piperacillin/tazobactam on gynecology/oncology patients, and twice-weekly rounds between ASP and a colorectal attending. Data from ASP/colorectal rounds from March 19, 2019 to April 16, 2019 showed means of 18.2 minutes taken for chart review and 4.4 minutes for discussion. 25 charts reviewed led to 16 (64%) ASP recommendations and 14/16 (87.5%) of recommendations accepted. Common interventions included: appropriate duration of antibiotics, clarification of the team's planned duration, and review of microbiology data to narrow therapy. Mean DOT decreased from 35.28 to 21.61 (39%) since July 2018 (Figure 3). Patient volume and case mix index remained stable throughout, suggesting no impact on DOT. Though CDI cases did not decrease, interventions were in place for only 2 months (Figure 4).

Conclusion. While too early to determine its impact on HO CDI rates, a multi-disciplinary team approach utilizing A3 problem solving was successful in implementing effective ASP measures including nursing-led ASP and structured antibiotic timeouts.

Figure 1. Key Drivers and Interventions Targeting HO CDI

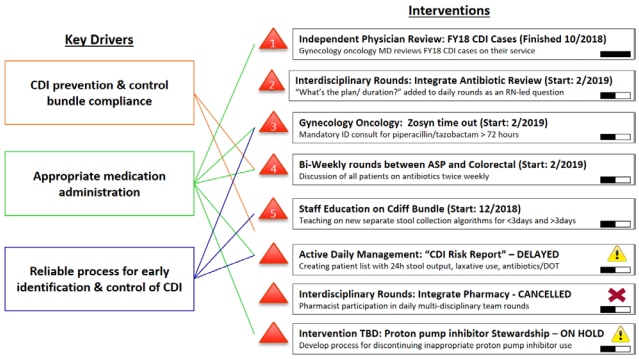


Figure 2. Nursing-led ASP: Integration of "What's the plan/duration" of antibiotics into Interdisciplinary Rounds

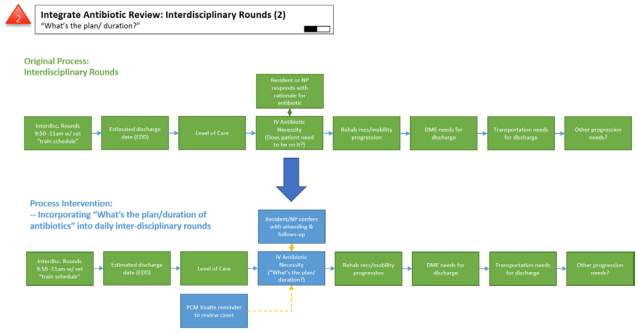


Figure 3. Total Antibiotic DOT Change Over Time: Before and After ASP Interventions

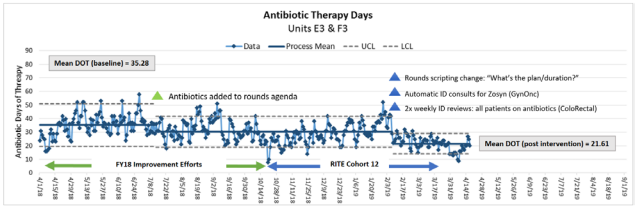
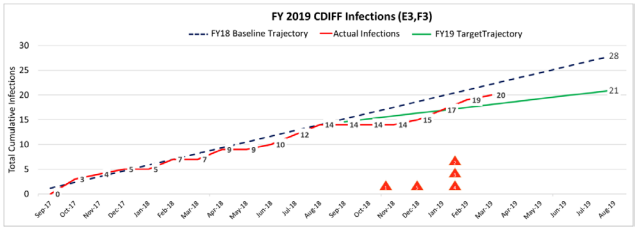


Figure 4. Baseline vs. Goal Trajectory of Cumulative HO CDI Rates on E3/F3 From FY2018 to FY2019



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

1985. Impact of Suppressing Ciprofloxacin Susceptibility Results on Antibiotic Utilization and Hospital-acquired *Clostridioides difficile* Infection

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Background. Fluoroquinolones (FQs) are broad-spectrum antibiotics associated with multiple adverse effects and an increased risk of *Clostridioides difficile* infections (CDI). Previous data suggest that suppression of FQ susceptibility results decreased FQ use. The purpose of this study was to examine the impact of suppressing ciprofloxacin susceptibility on antibiotic use, susceptibility, and CDI.

Methods. This was a single-center quasi-experimental study of the effect of the suppression of ciprofloxacin susceptibility on pan susceptible urine isolates for *Klebsiella* sp. and *E. coli* starting in March 2018 in the 11 months before and after the intervention. Monthly antibiotic utilization in days of therapy (DOT)/1,000 patient-days for levofloxacin, ciprofloxacin, ceftriaxone, trimethoprim/sulfamethoxazole (TMP/SMZ), fosfomycin, and nitrofurantoin, hospital-acquired CDI (HA-CDI) rates as defined by CDC, and *Pseudomonas aeruginosa* susceptibility was compared with interrupted time series analysis using Stata MP 12.1 before and after the intervention to compare the level, intercept, and rate, slope, of a trend line.

Results. There was no change in the level or rate of ciprofloxacin DOT (0.27, 95% CI: −0.94 to 1.48–3.49; 95% CI: −10.89 to 3.90) and levofloxacin DOT (−5.87, 95% CI: −17.79 to 6.06; −0.98, 95% CI −2.86 to 0.90) with the intervention, respectively. Level of *P. aeruginosa* susceptibility to ciprofloxacin level (8.13, 95% CI: 0.00 to 16.26) had a trend toward increasing and rate (1.65, 95% CI: 0.44 to 2.87) increased after the intervention. Ceftriaxone DOT level decreased after the intervention (P = 0.01), but the rate did not change. Cephalexin (P = 0.01) and nitrofurantoin (P = 0.01) DOT levels increased after the intervention without changes in rates. There was no change in the level or rate of HA-CDI, fosfomycin, or TMP/SMZ DOTs.

Conclusion. Suppressing ciprofloxacin susceptibility results on pan susceptible *Klebsiella* sp. and *E. coli* urine isolates was associated with increased *P. aeruginosa* susceptibility to ciprofloxacin and increased cephalexin and nitrofurantoin DOTs. No changes were seen in FQ use or HA-CDI rates.

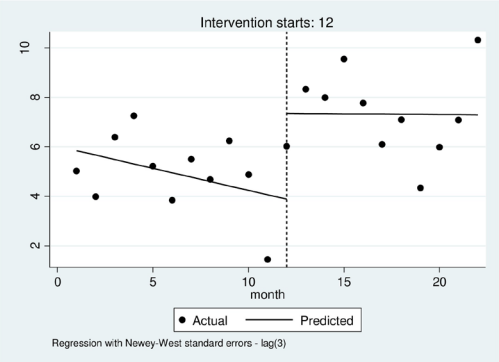

Figure 2: Nitrofurantoin utilization before and after suppression

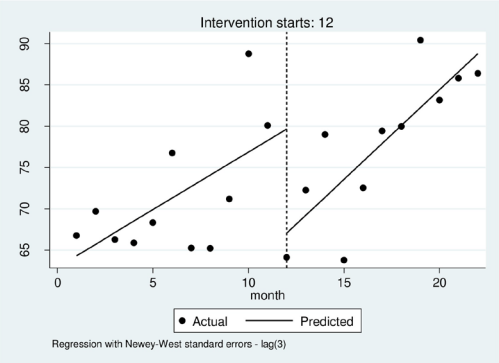

Figure 4: Ceftriaxone utilization before and after suppression

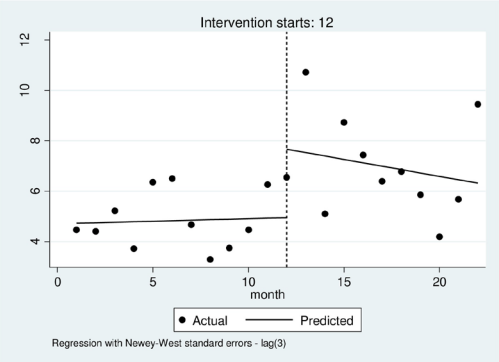

Figure 3: Cephalexin utilization before and after suppression

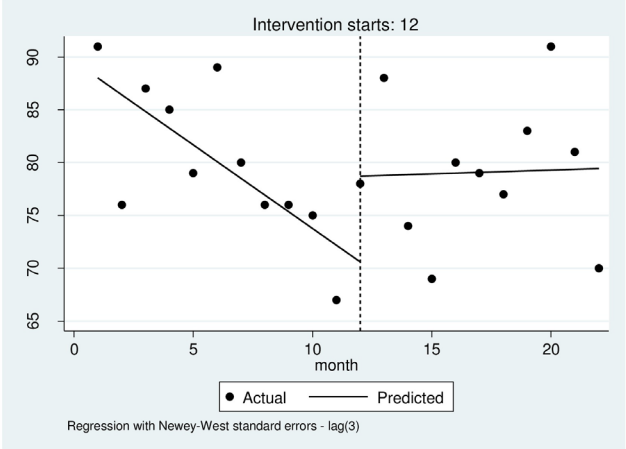

Figure 1: *P. aeruginosa* susceptibility to ciprofloxacin before and after suppression

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

1986. Impact of Two-Step Testing on the Diagnosis and Management of *Clostridium difficile* in a Multi-Hospital Healthcare System

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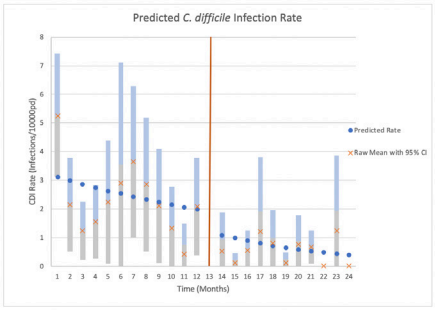
Background. Distinguishing active *C. difficile* infection (CDI) from asymptomatic colonization remains a significant challenge. A multi-step testing algorithm can improve the diagnostic accuracy of CDI and associated antibacterial prescribing. This study evaluated the impact of two-step testing on CDI rates and management in a multi-hospital community health system.

Methods. Two-step *C. difficile* testing (PCR for initial screening followed by EIA for toxin detection) was implemented in 6 acute care community hospitals in April 2018. EIA testing was automatically performed on all stool samples with a positive *C. difficile* PCR result. Prior to implementation, PCR alone was used to identify CDI. Messaging attached to the PCR laboratory report alerted prescribers of discrepant results (PCR +/EIA -). Anti-*C. difficile* therapy was at the discretion of the prescriber. We performed a retrospective cohort analysis over a 2-year period to evaluate the effect of two-step testing on system-wide hospital-onset CDI (HO-CDI) per 10,000 patient-days (PD) and anti-CDI antimicrobial use (AU) in days of therapy (DOT) per 1,000 PD. Segmented negative binomial regression with hospital clustering was used to estimate predicted HO-CDI rate for the baseline period between April 1, 2017 through March 31, 2018 and the post-intervention between May 1, 2018 through March 31, 2019. The implementation date at all sites in April 2018 was unknown; therefore, this month was removed from the analysis. Anti-CDI agents included fidaxomicin, metronidazole, and oral vancomycin, but may have included non-CDI indications for metronidazole.

Results. A total of 115 HO-CDI cases were identified; 91 (79%) before and 24 (21%) after. Prior to implementation of two-step testing, CDI rates declined at 4% per month (P = NS). The rate immediately dropped by 36% (P = 0.004) after two-step testing was implemented, but the trend did not significantly change (P = 0.52, Figure 1). Community-onset CDI rates also decreased during this time period. Combined facility-wide anti-CDI agent use was 824.87 before and 838.21 DOT/1,000 PD after and did not significantly change.

Conclusion. Use of a two-step approach for CDI testing reduced HO-CDI rates, but did not have a significant impact on anti-CDI antibiotic use in a multi-hospital community health system.

Figure 1:



LABEL	MEAN ESTIMATE	CONFIDENCE LIMITS		P VALUE
TREND BEFORE INTERVENTION	0.96	0.8759	1.0522	0.3832
IMMEDIATE CHANGE IN APRIL 2018	0.6356	0.4673	0.8646	0.0039
CHANGE IN TREND AFTER INTERVENTION	0.9398	0.7763	1.1378	0.5245
TREND AFTER INTERVENTION	0.9023	0.8155	0.9983	0.0463

Table 1.
Monthly HO-CDI infections:

	BEFORE				AFTER			
Facility	Year	Month	HO-CDI Infection	Patient Days	Year	Month	HO-CDI Infection	Patient Days
Piedmont Hospital	2017	4	1	13561	2018	4	1	13561
Piedmont Hospital	2017	5	3	12670	2018	5	4	12660
Piedmont Hospital	2017	6	3	12672	2018	6	1	12656
Piedmont Hospital	2017	7	3	12252	2018	7	2	12307
Piedmont Hospital	2017	8	2	12790	2018	8	1	12570
Piedmont Hospital	2017	9	4	12174	2018	9	4	12402
Piedmont Hospital	2017	10	1	12310	2018	10	1	12470
Piedmont Hospital	2017	11	2	12183	2018	11	2	11390
Piedmont Hospital	2017	12	3	12148	2018	12	1	12251
Piedmont Hospital	2018	1	2	12417	2019	1	0	12868
Piedmont Hospital	2018	2	3	11978	2019	2	1	11910
Piedmont Hospital	2018	3	0	12702	2019	3	0	12907
Piedmont Fayette Hospital	2017	4	3	5161	2018	4	1	5086
Piedmont Fayette Hospital	2017	5	2	5017	2018	5	0	5085
Piedmont Fayette Hospital	2017	6	0	5061	2018	6	0	5056
Piedmont Fayette Hospital	2017	7	2	5170	2018	7	0	4137
Piedmont Fayette Hospital	2017	8	0	5072	2018	8	0	3995
Piedmont Fayette Hospital	2017	9	0	5135	2018	9	1	5030
Piedmont Fayette Hospital	2017	10	2	5417	2018	10	0	4317
Piedmont Fayette Hospital	2017	11	1	5485	2018	11	0	4564
Piedmont Fayette Hospital	2017	12	0	5443	2018	12	1	4558
Piedmont Fayette Hospital	2018	1	3	4408	2019	1	0	4457
Piedmont Fayette Hospital	2018	2	0	5713	2019	2	0	5799
Piedmont Fayette Hospital	2018	3	1	5391	2019	3	0	4409
Piedmont Henry Hospital	2017	4	3	5120	2018	4	2	5416
Piedmont Henry Hospital	2017	5	1	5488	2018	5	0	5088
Piedmont Henry Hospital	2017	6	0	5140	2018	6	0	5045
Piedmont Henry Hospital	2017	7	0	5298	2018	7	1	5298
Piedmont Henry Hospital	2017	8	0	5386	2018	8	0	5190
Piedmont Henry Hospital	2017	9	1	5742	2018	9	0	5105
Piedmont Henry Hospital	2017	10	0	5038	2018	10	0	5552
Piedmont Henry Hospital	2017	11	1	5085	2018	11	0	5558
Piedmont Henry Hospital	2017	12	7	6242	2018	12	1	6026
Piedmont Henry Hospital	2018	1	0	6182	2019	1	0	6033
Piedmont Henry Hospital	2018	2	0	5368	2019	2	0	5187

Piedmont Henry Hospital	2018	3	1	5701	2018	3	0	5537
Piedmont Newnan Hospital	2017	4	3	3210	2018	4	0	3188
Piedmont Newnan Hospital	2017	5	3	3151	2018	5	0	3083
Piedmont Newnan Hospital	2017	6	1	3361	2018	6	0	3432
Piedmont Newnan Hospital	2017	7	1	3369	2018	7	0	3678
Piedmont Newnan Hospital	2017	8	2	3441	2018	8	0	3530
Piedmont Newnan Hospital	2017	9	0	3446	2018	9	0	3341
Piedmont Newnan Hospital	2017	10	1	3551	2018	10	0	3536
Piedmont Newnan Hospital	2017	11	1	3542	2018	11	1	3752
Piedmont Newnan Hospital	2017	12	1	3777	2018	12	0	4080
Piedmont Newnan Hospital	2018	1	0	3845	2019	1	0	4130
Piedmont Newnan Hospital	2018	2	0	3370	2019	2	0	3630
Piedmont Newnan Hospital	2018	3	1	3997	2019	3	0	4138
Piedmont Mountainside Hospital	2017	4	0	1214	2018	4	0	1236
Piedmont Mountainside Hospital	2017	5	0	1145	2018	5	0	1248
Piedmont Mountainside Hospital	2017	6	0	1091	2018	6	0	1196
Piedmont Mountainside Hospital	2017	7	0	1025	2018	7	0	1132
Piedmont Mountainside Hospital	2017	8	0	1014	2018	8	0	1123
Piedmont Mountainside Hospital	2017	9	0	1037	2018	9	0	1233
Piedmont Mountainside Hospital	2017	10	1	1055	2018	10	0	1155
Piedmont Mountainside Hospital	2017	11	1	1100	2018	11	0	1161
Piedmont Mountainside Hospital	2017	12	0	1152	2018	12	0	1182
Piedmont Mountainside Hospital	2018	1	0	1159	2019	1	0	1180
Piedmont Mountainside Hospital	2018	2	0	1092	2019	2	0	1137
Piedmont Mountainside Hospital	2018	3	0	1201	2019	3	0	1137
Piedmont Newnan Hospital	2017	4	1	1718	2018	4	0	1483
Piedmont Newnan Hospital	2017	5	1	1747	2018	5	0	1474
Piedmont Newnan Hospital	2017	6	0	1647	2018	6	0	1524
Piedmont Newnan Hospital	2017	7	0	1655	2018	7	0	1537
Piedmont Newnan Hospital	2017	8	1	1658	2018	8	0	1540
Piedmont Newnan Hospital	2017	9	2	1606	2018	9	0	1487
Piedmont Newnan Hospital	2017	10	0	1643	2018	10	0	1554
Piedmont Newnan Hospital	2017	11	0	1563	2018	11	0	1581
Piedmont Newnan Hospital	2017	12	0	1617	2018	12	0	1579
Piedmont Newnan Hospital	2018	1	1	1642	2019	1	0	1892
Piedmont Newnan Hospital	2018	2	1	1751	2019	2	1	1721
Piedmont Newnan Hospital	2018	3	0	1665	2019	3	0	1591
Total			91	840273			24	267628