a 21.9% decrease in incident C. difficile cases (P < 0.001), while a 30% decrease in PPI use corresponded with a 9.1% reduction (P < 0.001) in incident cases. There was no evidence of a synergistic effect between the two interventions (P = 0.60). PPI stewardship also decreased length of stay, resulting in a 7% increase in admissions in the simulated ICUs (P < 0.001).

Conclusion. PPI stewardship might prove a valuable adjunct to existing antibiotic stewardship programs. The reductions in C. difficile transmission were more modest for PPI stewardship as compared with programs targeting fluoroquinolones. PPI stewardship, however, may reach different patient populations, and may represent an additional area for substantial improvement even in facilities that have made substantial gains in reducing fluoroquinolone use.

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516. Implementation of a Probiotic for the Primary Prevention of Hospital-Onset Clostridium difficile Infection
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Session: 59. Healthcare Epidemiology: Updates in C. difficile
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Background. Hospital-onset Clostridium difficile infection (HO-CDI) affects over 100,000 patients in the United States each year. Due to a rising rate of HO-CDI at Denver Health, a multifaceted CDI prevention plan was implemented which included a probiotic intervention. The purpose of this study was to describe the implementation and uptake of the probiotic intervention.

Methods. This is a retrospective study of adult inpatients who received antibiotics considered high-risk for the development of CDI from March 2017 to March 2018. In March 2017, a Best Practice Advisory (BPA) was implemented to advise providers to order Bio-K+ (L. acidophilus, L. casei, and L. rhamnosus) when they signed an order for a high-risk antibiotic. The BPA allowed providers to order or decline the probiotic directly from the BPA. The BPA was suppressed in patients who were pregnant, immunocompromised, unable to take oral medications, or had active CDI. The primary outcome was the proportion of patients for whom Bio-K+ was prescribed in the first year. Secondary outcomes include CDI rates before and after the intervention and adverse events defined as a positive Lactobacillus culture.

Results. The BPA fired in 3,840 cases, and Bio-K+ was ordered in 94.8% of these. For patients who received a high-risk antibiotic for at least 24 hours, there were 2,636 courses of Bio-K+ prescribed for 2,324 unique patients for a median duration of 3 days. The HO-CDI rates for 1 year pre- and post-intervention were 0.75 and 0.60 cases per 1,000 patient days, respectively (P = 0.16). Lactobacillus was cultured in 11 patients; five patients received Bio-K+ prior to culture. The positive cultures were from abdominal fluid (4) and sputum cultures (2). No candida, staphylococcal, or clostridial blood cultures in patients who received the probiotic.

Conclusion. A probiotic intervention for the prevention of CDI implemented via BPA had excellent provider uptake. As part of a multifaceted CDI action plan, a probiotic intervention was well received and had a low risk of serious adverse events.

Figure 1.

Table 1.

| Male, n (%) | 1,517 (68) |
| Age, mean | 54 |
| Length of stay, median days (IQR) | 5 (3–9) |
| Days of Bio-K+, median (IQR) | 3 (2–6) |
| Courses of high-risk antibiotics | 1,185 |
| Ceftriaxone | 516 |
| Piperacillin/tazobactam | 279 |
| Amoxicillin/subactam | 260 |
| Clindamycin | 250 |
| Levofloxacin | 217 |
| Other | 176 |

517. Impact of Doxycycline in Place of Azithromycin for Community-Acquired Pneumonia on Clostridium difficile Infections
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Background. As antimicrobial exposure represents a major risk factor in the development of Clostridium difficile infection (CDI), optimization of antimicrobial selection is critical. While a number of antibiotics have been associated with increased risk of CDI, doxycycline may be considered protective. The combination of ceftriaxone and doxycycline (CTX-D) is supported by the Infectious Diseases Society of America (IDSA) for the management of community-acquired pneumonia (CAP). The primary objective of this study was to evaluate if CTX-D is associated with a reduced incidence of CDI compared with ceftriaxone and azithromycin (CTX-A) among nonintensive care unit (ICU) patients with CAP at Christiana Care Health System.

Methods. A retrospective cohort study was conducted to evaluate patients who received CTX-D or CTX-A admitted to Christiana Care between June 1, 2015 and December 31, 2017. Non-ICU patients, aged 18 years or older, receiving at least one dose of CTX-D or CTX-A were included. The primary outcome of our study was the incidence of CDI within 30 days from initial dose of CTX-D or CTX-A. The secondary outcome was the time to onset of CDI from initial dose of CTX-D or CTX-A.

Results. One thousand sixty-four unique patients were included in this study. Overall, 778 patients received CTX-D and 286 received CTX-A. Among patients who received CTX-D, 2 patients developed CDI, compared with five patients who received CTX-A (relative risk, 0.15; 95% confidence interval, 0.03–0.75; P = 0.02). The mean time to onset of CDI from initiation of CTX-D was 22 days compared with 9.2 days from initiation of CTX-A.

Conclusion. In this cohort of non-ICU patients with CAP, CTX-D was associated with a reduced incidence of CDI. Further studies are necessary to confirm these preliminary findings to optimize clinical practice, while minimizing potential adverse outcomes associated with antimicrobial use.

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518. Modeling the Potential Impact of Administering Vaccines Against Clostridium difficile Infection to Individuals in Healthcare Facilities
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Background. Vaccines against Clostridium difficile infection (CDI) are in development, with potential to directly protect those vaccinated and to mitigate transmission by reducing environmental contamination caused by prevented symptoms. For a vaccine that may or may not alter susceptibility to acquiring colonization, its projected transmission-reduction effect may depend on the contribution of symptomatic CDI to overall transmission, which remains uncertain. Mathematical models can help project population effects of vaccine administration under assumptions consistent with existing data.

Figure 2.

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