opportunities and washes are recorded. eHH after CDI patient contact and any patient contact were collected. eHH adherence (using an ABHR or soap dispenser within 1 minute of room exit) was calculated overall and stratified by soap and water vs. ABHR. The primary outcome was eHH adherence using soap and water vs. ABHR after contact with a CDI patient. The secondary outcome was eHH adherence after CDI patient contact compared with all patients with and without CDI.

**Results.** A total of 1,061,288 exit eHH opportunities were recorded. Seventy-three CDI cases were identified (none in December 2017), and 16,404 (2%) exit eHH opportunities were linked to rooms with CDI patients. eHH adherence after CDI patient contact (78%) was significantly higher than for any patient contact (75%) (P < 0.001). Mean eHH adherence using soap and water after CDI patient contact was 29%; no changes in trend were noted over time (Figure 1).

**Conclusion.** Low adherence to mandated soap and water use after CDI patient contact was observed; however, HCW maintained a high level of overall adherence. This may indicate that concerns of inconsistent messaging reducing overall adherence may not be founded. ABHR may be used more often than soap and water after CDI patient care because our glove use is high; further investigation will be necessary to determine whether this is the case.

513. Effectiveness of Pulsed Xenon Ultraviolet Light Disinfection System to Decrease Clostridium difficile Infections at the South Texas Veterans Health Care System

**Background.** *Clostridium difficile* is the leading pathogen implicated in healthcare-associated infections. *C. difficile* spores can survive for months on surfaces, allowing for transmission between patients; thus, environmental disinfection is a cornerstone of C. difficile infection (CDI) prevention. Pulsed xenon ultraviolet (PX-UV) light disinfection effectively eliminates *C. difficile* spores from surfaces and can be used as an adjunct to manual cleaning; however, few studies have evaluated the effects of this technology on healthcare facility-onset CDI (HO-CDI) rates. The objective of this study was to compare HO-CDI rates prior to and post-implementation of PX-UV disinfection in an acute care hospital.

**Methods.** This was a quasi-experimental study in the South Texas Veterans Health Care System (STVHCS), San Antonio, Texas from 2011 to 2018. The PX-UV system was implemented beginning January 1, 2013. HO-CDI rates were calculated as CDI cases per 10,000 patient-days. Rates were compared between the pre-PX-UV period (2011–2012) and post-PX-UV period (2013–2018) using the conditional maximum likelihood estimate of rate ratio. The association between number of beds cleaned and HO-CDI incidence was evaluated using Pearson correlation.

**Results.** During the 2-year preintervention period, the HO-CDI rate was 9.09 per 10,000 patient-days compared with 9.44 per 10,000 patient days in the postintervention period (RR 1.038; 95% CI 0.817 – 1.328) (P = 0.6763). HO-CDI rates peaked in 2015 (13.60 per 10,000) and declined steadily thereafter through 2018 (6.86 per 10,000). There was not a significant correlation between number of beds cleaned and HO-CDI incidence (R=−0.3713; 95% CI −0.5957–0.6856; P = 0.0889).

**Conclusion.** PX-UV disinfection did not significantly reduce HO-CDI rates in the first 5 years of use; however, more recent data demonstrate HO-CDI rates lower than that of the preintervention period.

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

514. The Effect of Probiotics on the Incidence of Clostridium difficile

**Background.** *Clostridium difficile* (CDI) is a major cause of healthcare-associated infections. The IDSA guidelines recommend probiotics as an approach to reduce the incidence and/or severity of CDI. Although, the IDSA guidelines recommend probiotics as an approach to reduce the incidence and/or severity of CDI, there are limited data to support the use of probiotics as a primary prophylaxis of CDI. The primary objective of this study was to evaluate whether the administration of probiotics is efficacious for CDI prophylaxis in patients who are on antibiotics making them at increased risk for contracting CDI.

**Methods.** The study is an Institutional Review Board approved retrospective cohort study looking at patients who were admitted to NYU Winthrop University Hospital and received at least one dose of antibiotics considered high-risk of inducing CDI. Patients were grouped according to concurrent probiotic use and the association between probiotic use and incident CDI was examined. A model for incident CDI adjusting for number of concurrent antibiotics, patient age, proton pump inhibitors, histamine receptor antagonists, presence of colitis, and chemotherapy was also estimated. Microbiology reports were analyzed for up to 12 weeks post initial administration of antibiotics to determine whether patient acquired CDI. If no CDI occurred during the admission or post discharge, data was censored at 12 weeks.

**Results.** Of 2,208 patients, 1,502 (68%) were included in the interim analysis. Ninety-six out of 1,502 patients (6.39%) had CDI within 12 weeks of antibiotics initiation. One hundred thirty-five (9%) were on probiotics during antibiotic use and 1,367 (91%) were not. Of those taking probiotics, 11.1% had an incident of CDI and of those not taking probiotics, 5.9% had an incident of CDI with a relative risk of 1.88 (1.11, 3.16) and a P = 0.02. After adjustment, although a positive association between probiotics and CDI was still observed, it was not statistically significant (P = 0.24).

**Conclusion.** Based on the interim analysis, probiotics were associated with a higher risk of CDI in univariate analysis, however, when adjusted for several confounding factors this association, while still positive, was no longer statistically significant. Further data collection is ongoing to corroborate these results.

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

515. Estimating the Effect of Proton Pump Inhibitor Stewardship in Reducing Clostridium difficile Transmission

**Background.** Antibiotic stewardship programs (ASPs) have been successful in reducing the incidence of *Clostridium difficile* (CDI) by reducing patient exposure to antibiotics, especially fluoroquinolones. Proton pump inhibitors (PPIs), while less recognized as a risk factor for CDI, are widespread in their use, often for much longer durations than most courses of antibiotics. PPI stewardship may be a potential target for ASPs. We used a mathematical model of *C. difficile* transmission in an ICU to estimate the effects of a co-occurring antibiotic and PPI stewardship program. This approach captured any synergistic dynamics between the two interventions (e.g., patients taking both PPIs and antibiotics) while being able to independently estimate their effects. This model simulated for five years and 5,000 iterations, with the reduction in antibiotic and PPI use independently varied independently between 0% and 40%. The rates of *C. difficile* were then estimated using Poisson regression models accounting for admission volume.

**Results.** Both antibiotic and PPI stewardship reduced the number of incident *C. difficile* cases within the simulated ICU. A 30% decrease in fluoroquinolone use corresponded with
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.

## Disclosures
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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

**Thursday, October 4, 2018: 12:30 PM**

**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 anti-biotic. 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 postintervention were 0.75 and 0.60 cases per 1,000 courses of Bio-K+ prescribed for 2,324 unique patients for a median duration of 3 days.

**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 synergistic effect between the two interventions (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).

### Disclosures
All authors: No reported disclosures.

### 517. Impact of Doxycycline in Place of Azithromycin for Community-Acquired Pneumonia on Clostridium difficile Infections

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**Session:** 59. Healthcare Epidemiology: Updates in C. difficile

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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.

### Disclosures
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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.