

**Conclusion.** Patients receiving chemotherapy for AL remain at risk for IFI despite the use of antifungal prophylaxis. In our study, prophylaxis with posaconazole suspension was found to be an independent risk factor for breakthrough IFI. Mortality was high among patients with breakthrough IFI.

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

**972. Asymptomatic Carriage of *Clostridioides difficile* and Risk of Subsequent Infection**

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**Background.** *C. difficile* is one of the most common healthcare-associated infections in the United States. Studies of patients with asymptomatic carriage of toxigenic *C. difficile* have reported conflicting results on the risk of subsequent *C. difficile* infection (CDI). Older studies suggest that the risk was low and colonization may be protective. Subsequent studies indicate that asymptomatic carriers have a 6-fold greater risk of developing CDI. The aims of our study were to assess the burden of asymptomatic *C. difficile* carriage and risk of subsequent CDI.

**Methods.** Adult inpatients at NorthShore University HealthSystem, Illinois hospitals between August 1, 2017 and February 28, 2018 were eligible for the study. Focused admission screening of patients at high risk of *C. difficile* carriage was performed: (1) history of CDI or colonization, (2) prior hospitalization past 2 months, or (3) admission from a long-term care facility. A rectal swab was collected and tested using the cobas<sup>®</sup> Cdiff Test (Roche) real-time PCR. The development of hospital onset CDI (HO-CDI) in colonized patients was monitored prospectively for at least 2 months. HO-CDI testing of colonized patients was performed using the Cepheid GeneXpert RT-PCR. HO-CDI was defined as patients hospitalized for at least 72 hours with 3 or more episodes of diarrhea/24 hours, in the absence of other potential causes of diarrhea. Patient demographics were collected using a standardized form and data analyzed using VassarStats.

**Results.** There were 6,104 patients enrolled in the study and 528 (8.7%) were positive on admission for toxigenic *C. difficile* carriage. The mean age of colonized patients was 75.5 years (range 24–103) and 56.4% (298 patients) were females. Of 528 colonized patients, 21 (4%) had a positive CDI test. A total of 7 patients (1.3%) developed HO-CDI. Mean time to positive HO-CDI was 46.1 days (range 5–120 days). Of 5,576 patients that were negative for *C. difficile* carriage on admission, 14 (0.3%) patients developed HO-CDI. The relative risk of HO-CDI was 5.28 (95% CI: 2.14–13.03,  $P = 0.05$ ).

**Conclusion.** We found that 8.7% of at-risk admissions were asymptomatic toxigenic *C. difficile* carriers. While only 1.3% developed HO-CDI, asymptomatic carriers had a 5 times higher risk of subsequent CDI compared with non-carriers.

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

**973. Inter-facility Patient Sharing and *Clostridium difficile* Incidence in the Ontario Hospital Network: A 13-Year Longitudinal Cohort Study of 116 Hospitals**

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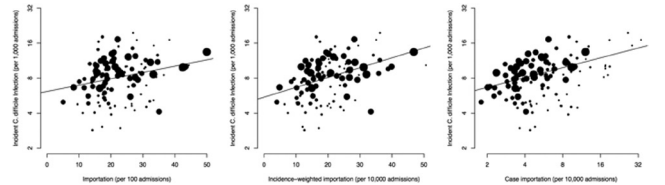
**Background.** Inter-facility patient movement plays an important role in the dissemination of antimicrobial resistance and *C. difficile* infection (CDI) throughout healthcare systems. However, the relative performance of different patient sharing metrics for predicting CDI incidence is not known. We compared 3 different measures of inter-facility patient sharing as they relate to CDI incidence in Ontario facilities.

**Methods.** A retrospective cohort analysis was used to predict incident CDI (ICD-10 = A04.7 identified from Discharge Abstract Database records) across Ontario hospitals ( $N_{\text{hospitals}} = 116$ ) between April 1, 2003 to March 31, 2016. Patients with a stay of <3 days and those with a history of CDI in the prior 90 days were excluded from the risk set but not from patient sharing metrics. Poisson regression models with facility-level random effects were used to predict facility CDI incidence (per 1,000 admissions) and measure the percent change in facility-level variance (PCV). The 3 metrics of inter-facility patient sharing included: (1) “importation”—the rate of patients with a discharge from another distinct facility in prior 90 days, (2) “incidence-weighted importation”—equal to importation weighted by the incidence of CDI in the previous facility, and (3) “case importation”—importation of patients with a history of CDI.

**Results.** Over the 13-year period, we observed 58,427 cases of healthcare-associated CDI among 12,750,000 admissions. Facility CDI incidence ranged from 2.9 to 19.6 per 1,000 admissions (6.8-fold range). Patient sharing

metrics were strongly related to facility CDI incidence (figure). In models adjusting for facility risk factors, all 3 measures still explained an important portion of inter-facility variation in CDI incidence: importation (PCV = 5%,  $P = 0.01$ ), incidence-weighted importation (PCV = 15%,  $P < 0.001$ ), and “case importation” (PCV = 48%,  $P < 0.001$ ).

**Conclusion.** We observed a substantial variation in facility CDI incidence that was explained by linkages between acute care facilities, especially linkage to other facilities with a high incidence of CDI. Facility infection prevention staff should consider incorporating the facility CDI incidence into risk stratification assessments of patient transfers.



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

**974. Impact of Mandatory Infectious Disease (ID) Specialist Approval on Hospital-Onset *Clostridium difficile* (HO-CDI) Testing and Infection Rates: Results of a Pilot Study**

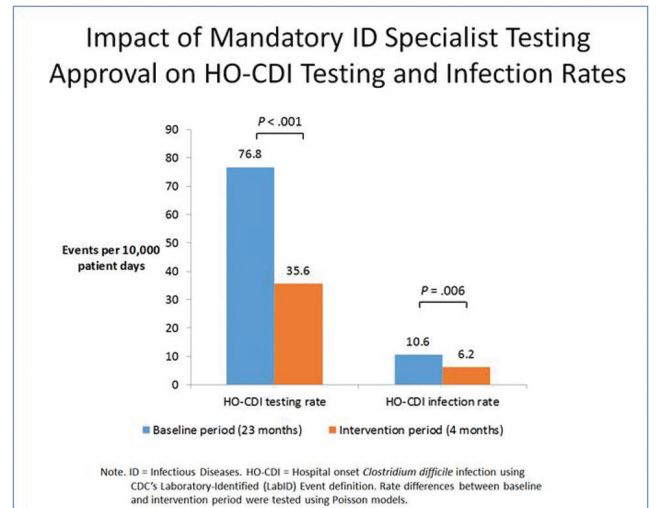
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**Background.** The 2017 IDSA *C. difficile* guidelines recommend the use of nucleic acid amplification testing alone for detection of HO-CDI if appropriate stool specimens are collected (e.g., patients not receiving laxatives and  $\geq 3$  unformed stools in 24 hours). The potential role of ID specialists in enforcing appropriate *C. difficile* testing is unclear.

**Methods.** At a single academic hospital, we performed a pilot study of an ID specialist-led approval process for *C. difficile* testing. During the baseline period (January 2016 and November 2017), HO-CDI testing appropriateness was enforced using a computerized decision support tool that discouraged inappropriate testing based on detected laxative use and stool frequency criteria; however, clinicians frequently ignored the computer alerts. During the intervention period (December 2017 and March 2018), all HO-CDI testing on hospital day 4 or later triggered a computer alert requesting mandatory testing approval by an ID specialist. Approvals were provided via telephone consultation 7 days a week between 8 a.m. and 5 p.m. (in both periods, CDI testing was not performed overnight). We analyzed differences HO-CDI testing and infection rates (defined by CDC’s LabID event) per 10,000 patient days using Poisson models. We also analyzed the number of approval pager calls, rates of *C. difficile* testing approval, and time burden.

**Results.** Two infectious diseases specialists (M.Y.L.; J.S.) primarily answered *C. difficile* pager approval requests; the remainder of approvals were provided by ID specialists already consulted on the patients. During the intervention period, ordering providers made 159 calls to the approval pager; 119 (75%) received approval. HO-CDI testing and infection rates declined between the baseline and intervention periods (figure). There was a mean of 1.3 pager approval requests per day (range, 0–4) with an average of 3 minutes of time spent per request.



**Conclusion.** An ID specialist-led *C. difficile* testing approval process was feasible and associated with a significant decrease in HO-CDI testing and infection rates, due to enforcement of appropriate testing. ID specialists can provide a key role in enforcing appropriate *C. difficile* testing, but more experience is needed with respect to sustainability.

**Disclosures.** M. Y. Lin, Stryker (Sage Products): Research support in the form of contributed product, Research support. OpGen, Inc: Research support in the form of contributed products, Research support. CareFusion Foundation (now BD): Grant Investigator, Research grant.

**975. Clostridium difficile Infection and Antibiotic Prescription Rates in the Community: Explaining the Gender Gap**

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**Background.** Previous studies have reported higher incidence rates of community-associated *Clostridium difficile* infection (CA-CDI) in women than in men. This cross-sectional population-based study examines whether this difference in CA-CDI rates across genders is driven by or independent of antibiotic use.

**Methods.** Medicaid and State Employee Health Plan pharmacy claims for outpatient oral antibiotics and associated medical claims were utilized for estimation of community antibiotic prescription rates in South Carolina population 18 to 64 years of age from January 1, 2015 to December 31, 2015. CA-CDI cases were identified from National Healthcare Safety Network (NHSN) and South Carolina Infectious Disease and Outbreak Network (SCION) through complete enumeration of South Carolina population of the same age and study period as above. Incidence rates of CA-CDI were reported in both men and women 18–39 and 40–64 years of age before and after adjustments for antibiotic prescription rates in the same gender and age group. The 95% confidence intervals (CI) were calculated to examine statistical difference in incidence rates across genders within the same age group.

**Results.** During the calendar year 2015, a total of 1,564 CA-CDI cases were identified in South Carolina residents 18–64 years of age. The incidence rate of CA-CDI per 100,000 person-years was higher in women than in men in age groups 18–39 years (37.3 [95% CI: 32.8–41.8] vs. 21.0 [95% CI: 17.6–24.4]) and 40–64 years (86.4 [95% CI: 80.1–92.8] vs. 56.6 [95% CI: 51.2–61.9]). Similarly, antibiotic prescription rates per 100 person-years were higher in women than men in the 2 respective age groups (118.8 [95% CI: 118.3–119.3] vs. 54.3 [95% CI: 53.9–54.8]) and 130.4 [95% CI: 129.8–130.9] vs. 83.8 [95% CI: 83.3–84.4]). After adjustments for antibiotic prescriptions, there was no significant difference in the incidence rates of CA-CDI per 100,000 prescriptions between women and men 18–39 years of age (31.4 [95% CI: 27.6–35.2] vs. 38.6 [95% CI: 32.4–44.8]) and 40–64 years old (66.3 [95% CI: 61.5–71.2] vs. 67.5 [95% CI: 61.1–73.8]).

**Conclusion.** Higher crude incidence rates of CA-CDI in women are likely due to higher outpatient antibiotic prescription rates in women when compared with men.

**Disclosures.** P. B. Bookstaver, CutisPharma: Scientific Advisor, <\$1,000. Melinta Therapeutics: Speaker's Bureau, <\$1,000.

**976. Clostridium difficile Colonization Molecular Epidemiology and Anti-toxin Serological Responses in Healthy Infants: A Prospective Cohort Study**

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**Background.** Infant *C. difficile* colonization is common, but the molecular epidemiology and immunologic consequences of colonization are poorly understood.

**Methods.** In this prospective cohort study of healthy infants, serial stools collected between 1–2 and 9–12 month olds were tested for glutamate dehydrogenase (detects nontoxicogenic or toxicogenic *C. difficile* [TCD]), *tdcB* PCR (detects TCD), and cultured for *C. difficile*. Isolates underwent whole genome sequencing and multilocus sequence typing (MLST). Clonal strains were identified by single nucleotide variant (SNV) analysis. TCD was confirmed by BLAST identification of *tdcA/tdcB*. Serum collected at 9–12 month olds underwent ELISA for measurement of IgA, IgG, and IgM against TCD toxins A and B. For comparison, anti-toxin IgG was measured in cord blood of 50 consecutive full-term deliveries (unrelated to study infants). Arbitrary ELISA units were compared by Wilcoxon rank-sum test.

**Results.** Among 32 infants, 16 (50%) had at least one TCD+ stool, 12 of whom were colonized at least 1 m prior to serology measurements (Figures 1 and 2). A variety of STs were identified, and evidence of putative in-home (enrolled siblings) and outpatient clinic transmission was identified (Figure 3). Infants with TCD colonization had significantly greater levels of anti-toxin IgA and IgG compared with non-colonized infants and IgG compared with unrelated cord blood (Table 1).

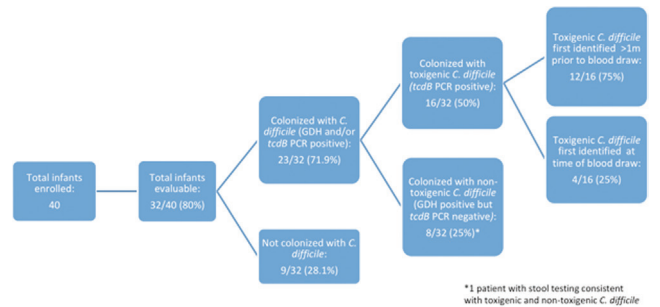
**Conclusion.** Infant *C. difficile* colonization is a dynamic process with variable strain types and duration. Outpatient clinics may be a *C. difficile* reservoir for some patients. TCD colonization is associated with a humoral immune response against toxins A and B, but whether natural TCD immunization protects against CDI later in life requires further investigation.

**Table 1:** Anti-toxin Serology (Arbitrary ELISA Units)

Group	Tox A IgA	Tox A IgG	Tox A IgM	Tox B IgA	Tox B IgG	Tox B IgM
Not colonized with TCD (n = 16)	1.37	10.14	2.74	0.8	6.50	6.14
Colonized with TCD for at least 1 month (n = 12)	4.23*	37.87*	2.54	1.73*	20.76*	5.96
Cord Blood (n = 50)		10.81^			8.34^	

\*P < 0.05 (colonized vs. non-colonized); ^P < 0.05 (colonized vs. cord blood)

**Figure 1:** Infant Classification



\*1 patient with stool testing consistent with toxicogenic and non-toxicogenic *C. difficile*

**Figure 2: Chronology and Results of Infant Stool *C. difficile* Testing**



**Figure 3: Molecular Epidemiology of Infant *C. difficile* Isolates**

