

**803. Risk factors associated with *Clostridioides difficile* infection in hospitalized patients with community-acquired pneumonia**

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Session: P-32. HAI: C. difficile

**Background.** Patients with community-acquired pneumonia (CAP) who are hospitalized and treated with antibiotics may carry an increased risk for developing *Clostridioides difficile* infection (CDI). Accurate risk estimation tools are needed to guide monitoring and CDI mitigation efforts. We aimed to identify patient-specific risk factors associated with CDI among hospitalized patients with CAP.

**Methods.** Design: retrospective case-control study of hospitalized patients who received CAP-directed antibiotic therapy between 1/1/2014 and 5/29/2018. Cases were hospitalized CAP patients who developed CDI post-admission. Control patients did not develop CDI and were selected at random from CAP patients hospitalized during this period. Variables: comorbidities, laboratory results, vital signs, severity of illness, prior hospitalization, and past antibiotic use. Propensity-score weights: identified via structural decomposition analysis of pre-treatment variables. Analysis: weighted classification tree models that predicted any CDI, hospital-onset CDI, and any healthcare-associated CDI according to CAP antibiotic treatment. Performance: percent accuracy in classification (PAC) and weighted positive (PPV) and negative predictive values (NPV). Modeling: completed using the ODA package (v1.0.1.3) for R (v3.5.1).

**Results.** A total of 32 cases and 232 controls were identified. Sixty pre-treatment variables were screened. Structural decomposition analysis, completed in two stages, identified prior hospitalization (OR 6.56, 95% CI: 3.01-14.31; PAC: 80.3%) and BUN greater than 29 mg/dL (OR 11.67, 95% CI: 2.41-56.5; PAC: 80.8%) as propensity-score weights. With respect to CDI, receipt of broad-spectrum anti-pseudomonal antibiotics was significantly (all P's < 0.05) associated with any CDI (NPV: 90.29%, PPV: 27.94%), hospital-onset CDI (NPV: 97.53%, PPV: 26.86%), and healthcare-associated CDI (NPV: 92.89%, PPV: 27.94%).

**Conclusion.** We identified risk factors available at hospital admission and empiric use of broad-spectrum Gram-negative antibiotics as being associated with the development of CDI. Model PPVs were over two-fold greater than our sample base rate. Increased monitoring and avoidance of overly broad antibiotic use in high-risk patients appears warranted.

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

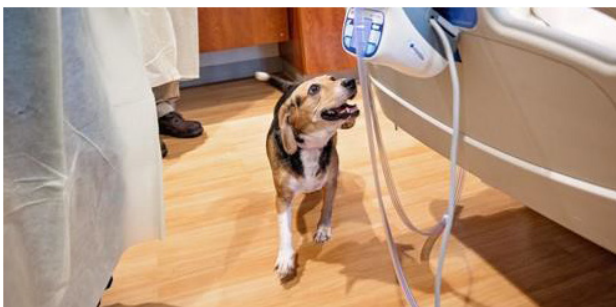
**804. Use of a Trained Canine to Detect *Clostridioides difficile* in the Hospital Environment**

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Session: P-32. HAI: C. difficile

**Background.** *Clostridioides difficile* infection (CDI) is the most common nosocomial infection in this country. The organism forms spores, which likely contribute to spread of infection in the hospital setting. Current guidelines call for special cleaning of rooms following discharge of patients who tested positive for CDI. There are currently no means to validate that cleaning has eradicated all of the spores. Canines (dogs) have been used to detect a variety of odors because of their superior olfactory abilities. A beagle was trained to detect the odor of *C. difficile* in the hospital setting.

Harley the *Clostridium difficile* sniffing canine.

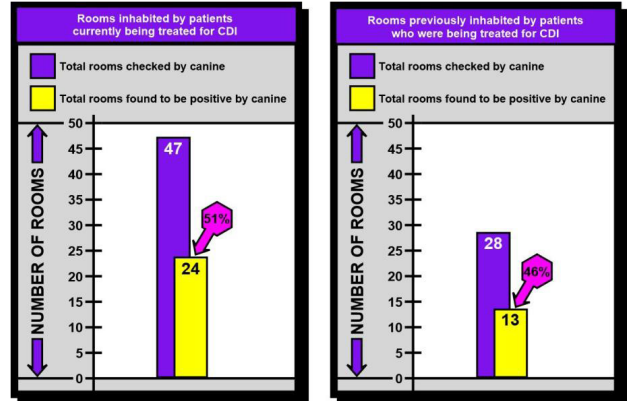


**Methods.** *C. difficile* was grown at the microbiology department at Vidant Medical Center (VMC). Culture plates containing the organism were used by a professional

trainer to train a two-year old female beagle dog. The canine was taught to sit when she identified the odor. The canine was given positive reinforcement with oral treats each time she identified the odor. Once the dog was proficient in identifying the organism, the trainer used clinical stool specimens that tested either positive or negative for *C. difficile*. Prior to coming into the hospital setting, the canine was able to identify positive stool samples with near 100% accuracy. The dog was brought to search rooms occupied or previously occupied by patients who had CDI. The study was approved by the Animal Use and Care Committee at East Carolina University and took place between October 2019 and March 2020 at VMC.

**Results.** The canine detected the presence of *C. difficile* in 51% of 47 rooms inhabited by patients currently being treated for CDI and in 46% of 28 rooms previously inhabited by patients that tested positive for CDI. In all positive rooms, the organism was detected on the bedrails. She did not detect *C. difficile* in any positive areas after they had been cleaned with bleach wipes.

Rooms found to be positive by canine.



**Conclusion.** Training a canine to detect *C. difficile* is an effective means of detecting the organism in the hospital environment. Use of a trained dog appears to be effective in validating the cleaning process of rooms that have been previously occupied by patients with CDI.

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**805. A Single Institution Pre/Post Comparison After Introduction of an External Urinary Collection Device for Female Medical Patients**

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Session: P-33. HAI: Device-Associated (CLABSI, CAUTI, VAP)

**Background.** Catheter associated urinary tract infections (CAUTIs) are the most common hospital acquired infections in the United States. External urinary collection devices (EUCDs) may serve as an alternative to indwelling urethral catheters (IUCs) and decrease the rate of CAUTIs. *PureWick*<sup>®</sup> is a novel female EUCD, with early case reports suggesting safe and efficacious use. However, no study has definitively proven benefit of *PureWick*<sup>®</sup> regarding reduction of CAUTIs. We sought to compare the CAUTI rate and median indwelling catheter days before and after availability of *PureWick*<sup>®</sup> at a single academic institution, as well as provide a descriptive analysis on female medical patients receiving an EUCD.

**Methods.** We performed a retrospective review of adult female patients admitted to our institution on a medical service who received an IUC and/or an EUCD. Patients admitted in the 3 months before (PRE) and 12 months after (POST) *PureWick*<sup>®</sup> availability were included. Two groups were compared: PRE patients who received an IUC vs. POST patients who received an IUC and/or EUCD.

**Results.** Out of 866 female patients, 296 received an EUCD in the POST cohort and overall, 673 received an IUC (261 (100%) PRE vs. 412 (68.1%) POST). There were no differences in the cohorts regarding age and comorbidities (all p > 0.05). Compared to the PRE cohort, the POST cohort had a higher number of IUC days (median, 3 vs. 2 days, p < 0.001) and a higher rate of CAUTI (infections per 1,000 catheter days, 11.8 vs. 4.1, p = 0.003) while overall UTI rate was similar (infections per 1,000 patient days, 19.1 vs. 14.12, p = 0.410). In the POST cohort, the rate of UTI associated with EUCD use was 11.6 infections per 1,000 device days. Measurement of strict ins and outs (56.8%) was the most common indication for use of EUCD.