associated with repeat CLABSIs than single CLABSIs ($P < .0001$). **Conclusions:** This analysis highlights differences in the aggregate pathogen distributions comparing single versus repeat CLABSIs. Assessing the pathogens associated with repeat CLABSIs may offer another way to assess the success of CLABSI prevention efforts (eg, clean insertion practices). Pathogens such as *Enterococcus* spp and *Klebsiella* spp demonstrate a greater association with repeat CLABSIs. Thus, instituting prevention efforts focused on these organisms may warrant greater attention and could impact the likelihood of repeat CLABSIs. Additional analysis of patient-specific pathogens identified in the repeat CLABSI group may yield further clarification.

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Poster Presentation

Patients with Positive Glutamine Dehydrogenase (GDH) Antigen/Toxin and Toxin Negative/PCR Positive Patients: A Comparison

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Background: A multistep algorithm using GDH antigen plus toxin with a reflex PCR is an acceptable method for detecting CDI. The use of the PCR in discordant cases can identify those patients who are colonized from those patients who have nontoxogenic strains of *C. difficile*. Identification of discordant patients has infection prevention implications. Treatment is not recommended for patients colonized with *C. difficile*. **Methods:** A line listing of patients with positive hospital-onset antigen/toxin positive and discordant PCR positive was created. Demographic information was extracted from medical records and the 2 cohorts were compared. **Results:** There were 59 discordant and 44 positive cases HO CDI cases from October 2017 through September 2019: (1) There was no difference in age and sex between the 2 groups. (2) Positive patients tended to have 3 loose stools before and after testing (57% vs 27%; $P = .026$). (3) Overall, 82% of positive patients had 1 of 3 signs or symptoms (leukocytosis, abdominal pain, and temperature >38°C) consistent with CDI compared to 66% of discordant patients ($P = .038$), and 55% of positive patients were more likely to have 2 of 3 signs or symptoms of CDI compared to 17% of discordant patients ($P = .00003$). (4) Also, 46% of discordant patients were either on the oncology ward or ICU compared to 32% of positive patients ($P = .764$). (5) There was no difference between in discordant compared to positive patients in non-CDI antimicrobial therapy within 7 days of CDI test submission (81% vs 84%, respectively). **Conclusions:** (1) Screening for CDI testing should include 3 loose stools and at least 2 of 3 signs or symptoms of CDI. (2) Discordant cases most likely represents colonization because only 17% of discordant patients had 2 of 3 CDI signs or symptoms at presentation. (3) Discordant cases without clinical features of CDI should not receive treatment to minimize antibiotic exposure. (4) Identification of discordant patients have infection prevention ramifications because CD can be indirectly transmitted by colonized patients; therefore, using PCR in addition to toxin testing is favored. (5) Antimicrobial therapy highly associated with CDI should be avoided, should antimicrobial therapy be necessary in PCR-positive discordant patients.

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	Num	Dem	PCR + %		Num	Dem	AgTx %
Laxative/Bowel stimulant?	14	59	24%		14	44	32%
Co-morbidity present?	55	59	93%		39	44	89%
Male	30	59	51%		24	44	55%
Female	29	59	49%		20	44	45%
Age (65 and up)	29	59	49%		22	44	50%
Age (under 65)	30	59	51%		22	44	50%
At least 3 stools 24 hours before or after collection	45	59	76%		40	44	91%
3 loose stools before AND after collection	16	59	27%		25	44	57%
At least 1 S/S (elevated WBC, elevated temp, abd pain)	39	59	66%		36	44	82%
At least 2 S/S (elevated WBC, elevated temp, abd pain)	10	59	17%		24	44	55%
All 3 S/S (elevated WBC, elevated temp, abd pain)	1	59	2%		3	44	7%
Discharged within 5 days of positive test result	6	59	10%		17	44	39%
Treated with PO Vanco or Dificid	33	59	56%		40	44	91%
Treated with PO Vanco, dificid, OR PO flagyl	42	59	71%		44	44	100%
On Oncology or ICU on the day of specimen collection	27	59	46%		14	44	32%
Any antibiotics within 7 days of loose stool	48	59	81%		37	44	84%

Fig. 1.

Presentation Type:
Poster Presentation

Pattern Recognition Algorithms for Predicting Surgical Site Infection in Abdominal Hysterectomy

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Background: This research represents an experiment based in surgical site infection (SSI) to patients undergoing abdominal hysterectomy surgery procedures in hospitals in Belo Horizonte, (population, 3 million). We statistically evaluated such incidences and studied the SSI prediction power of pattern recognition algorithms, the artificial neural networks based in multilayer perceptron (MLP). **Methods:** Between July 2016 and June 2018, data on SSI were collected by the hospital infection control committees (CCIH) of the 3 hospitals involved in the research. They collected all data used in the analysis during their routine SSI surveillance procedures. The information was forwarded to the NOIS (Nosocomial Infection Study) Project, which used SACIH (ie, automated hospital infection control system software) to collect data from a sample of hospitals participating voluntarily in the project. After data collection, 3 procedures were performed for SSI prediction: (1) a treatment of the database collected for the

use of intact samples; (2) a statistical analysis on the profile of the hospitals collected; and (3) an assessment of the predictive power of 5 types of MLP (ie, backpropagation standard, momentum, resilient propagation, weight decay, and quick propagation). MLPs were tested with 3, 5, 7, and 10 hidden-layer neurons and a database split for the resampling process (65% or 75% for testing, 35% or 25% for validation). They were compared by measuring area under the curve (AUC; range, 0–1) presented for each of the configurations. **Results:** From 1,166 records collected, only 665 records were enabled for analysis. Regarding statistical data: the average duration of surgery was 100 minutes (range, 31–180); patients were aged 41–49 years; the SSI rate was low (only 10 cases); the average length of stay was 2 days; and there were no deaths among the cases. Moreover, 29% of the operative sites were contaminated and 57% were potentially contaminated, revealing a high rate of potential contamination in the operative sites. The prediction process achieved 0.995. **Conclusions:** Despite the noise in the database, it was possible to obtain a relevant sampling to evaluate the profile of hospitals in Belo Horizonte. In addition, for the predictive process, although some settings achieved AUC results of 0.5, others achieved and AUC of 0.995, indicating the promise of the automated SSI monitoring framework for abdominal hysterectomy surgery (available in www.sacihweb.com). To optimize data collection and to enable other hospitals to use the SSI prediction tool, a mobile application was developed.

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Patterns and Predictors of UTI Treatment Practices in Nursing Homes

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Background: Suspicion of urinary tract infection (UTI) is the most common justification for prescribing antibiotics in nursing homes. More than half of antibiotic prescriptions for treatment of UTI in nursing homes are either unnecessary or inappropriate. Achieving a better understanding of the factors that underlie UTI treatment decisions is necessary to improve the quality of antibiotic prescribing in nursing homes. An ongoing hybrid type 2 effectiveness-implementation cluster randomized trial of a recently developed nursing home UTI recognition and management tool kit provided us with an opportunity to explore the influence of organizational, clinical, and staff attributes on UTI antibiotic prescribing practices in nursing homes. **Methods:** Data on antibiotic starts for suspected UTIs were collected in 29 nursing homes over a 9-month period. Antibiotic practices evaluated included total antibiotic starts per 1,000 resident days, % antibiotic starts with treatment duration >7 days, % antibiotic starts in which the initial antibiotic choice was a fluoroquinolone, and % antibiotic starts meeting UTI toolkit criteria of appropriateness. Prior research and bivariate analyses were used to select clinical and organizational attributes as well as individual nursing staff-level retention rates for inclusion in a stepwise linear regression model for each antibiotic practice outcome. **Results:** In total, 602 UTI antibiotic events were evaluated. Four associations were identified for antibiotic starts including nursing home urine culture rate, ICP status, nonprofit and part-time LPN retention. Nursing homes with higher full-time LPN retention had a lower rate of antibiotic treatment duration >7 days. Full-time CNAs and part-time LPNs retention and for-profit status was associated with the proportion of fluoroquinolone antibiotic starts. No attributes influenced the proportion of antibiotic starts meeting appropriateness criteria (Fig. 1). Urine culture rates are driving overall nursing home antibiotic prescribing. **Conclusions:** Urine culture practices was strongly associated with UTI treatment rates in nursing homes. A variety of organizational characteristics were also associated with UTI treatment rates as well as other UTI antibiotic prescribing practices. Some of these associations appear paradoxical but may reflect increasing resident acuity and increased capacity to standardize practices through organizational centralization.

	UTI Prescribing Practices			
Predictors	Total AS per 1,000 resident days	% AS with treatment duration > 7 days	% AS where initial antibiotic was a fluoroquinolone	% AS meeting appropriateness criteria
Facility Urine Culture Rate	OR = 2.20 (p < 0.001)	---	---	---
ICP Full Time Equivalent	OR = 1.21 (p = 0.015)	---	---	---
Non Profit Status	OR = 0.82 (p = 0.019)	---	---	---
For Profit NHs	---	---	OR = 0.82 (p = 0.009)	---
Full-time LPN retention rate[1]	---	OR = 0.76 (p = 0.002)	---	---
Part-time LPN retention rate[1]	OR = 0.84 (p = 0.032)	---	OR = 1.13 (p = 0.045)	---
Full time CNA retention rate[1]	---	---	OR = 0.81 (p = 0.001)	---

[1] Staff retention rates for full and part-time staff is above the average for all reporting nursing homes (1=Yes, 0 = No)

Fig. 1.

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Peer Comparison Intervention to Improve Antibiotic Prescribing in Dentistry

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Background: Dentists prescribe an estimated 13% of outpatient antibiotic courses, many of which may be unnecessary. Health departments are in a unique position to support implementation of antibiotic stewardship across healthcare facilities, including in dental offices. A customized peer comparison message with feedback regarding prescribing frequencies was effective in reducing inappropriate prescribing among primary care physicians in Massachusetts and California. We tested the effect of a peer comparison message for antibiotic prescribing on dentists in the Massachusetts Medicaid program. **Methods:** We analyzed data from September 2018 to July 2019 for prescriptions of antibiotic courses by dentists to identify the highest prescribing dentists. We used their national provider identifier (NPI) to deduplicate