	MRSA (n = 67) OR (95% CI)	VREfm (n = 101) OR (95% CI)	VREfc (n = 49) OR (95% CI)	CipREc (n = 34) OR (95% CI)
Urinary catheter use in past 30 days	1.37 (0.7 - 2.6)	1.69 (0.94 - 3)	-	-
Physical self-maintenance score	**1.15 (1.08 - 1.23)**	**1.08 (1.02 - 1.15)**	**1.07 (1 - 1.14)**	**1.11 (1.02 - 1.2)**
Length of hospital stay	-	**1.06 (1.02 - 1.11)**	-	-
Charlson comorbidity score	-	1.05 (0.91 - 1.19)	**1.17 (1.01 - 1.35)**	-
Exposure to third/fourth-generation Cephalosporins in ACH	**2.48 (1.03 - 5.81)**	**3.96 (1.97 - 8.09)**	-	-
Exposure to Glycopeptides in ACH	**2.95 (1.23 - 6.93)**	**2.77 (1.29 - 5.94)**	**2.62 (1.02 - 6.41)**	-
ACH 8	0.63 (0.19 - 1.8)	1.18 (0.45 - 2.94)	0.43 (0.09 - 1.43)	0.7 (0.1 - 3.03)
ACH 10	0.77 (0.32 - 1.8)	0.83 (0.35 - 1.9)	0.59 (0.22 - 1.47)	2.27 (0.82 - 6.46)
ACH 19	1.3 (0.44 - 3.54)	**2.48 (1.06 - 5.83)**	0.7 (0.18 - 2.18)	1.64 (0.33 - 6.42)
ACH 20	0.51 (0.17 - 1.35)	0.63 (0.22 - 1.61)	0.51 (0.16 - 1.42)	1.53 (0.47 - 4.76)
ACH 26	0.93 (0.37 - 2.25)	1.6 (0.7 - 3.61)	1.2 (0.47 - 2.92)	1.53 (0.42 - 5.06)

Table 1. Associations between patient characteristics, facility exposure and colonization with an antibiotic-resistant organism (ARO) upon admission to a nursing facility by ARO. Results of multivariate analysis adjusting for patient factors and recent hospital exposure are presented. "-" indicates that the covariate was not included in the final model because the p value was >= 0.1 in the univariate analysis. Risk factors significantly associated with ARO colonization at admission are bolded. Functional status was measured by physical self-maintenance score. Hospitals with fewer than 50 discharges were collapsed and used as the referent group. Abbreviations: ACH, acute-care hospital; MRSA, methicillin-resistant *Staphylococcus aureus*; VREfm, vancomycin-resistant *Enterococcus faecium*; VREfc, vancomycin-resistant *Enterococcus faecalis*; CipREc, ciprofloxacin-resistant *Escherichia coli*, OR (95% CI) = odds ratio and 95% confidence interval.

Table. 1.

(MRSA), vancomycin-resistant *Enterococcus faecalis* (VREfc), *Enterococcus faecium* (VREfm), and ciprofloxacin-resistant *Escherichia coli* (CipREc). **Methods:** We studied colonizing isolates collected via active surveillance of 584 patients in 6 Michigan nursing facilities between 2013 and 2016. The whole genome of the first isolate of each ARO species collected from each patient was sequenced and analyzed to identify sequence types (STs) and to infer the transmission network by species. We determined the connectedness between nursing facilities based on the number of patients received from the same ACHs and assigned each ARO to the most recent ACH using curated transfer information. The associations between patient characteristics and recent ACH exposures with colonization by ARO were examined using multivariable models. **Results:** Most of the sequenced ARO isolates belonged to major healthcare-associated lineages: MRSA (ST5, N = 78 of 117); VREfc (ST6, N = 68 of 75); CipREc (ST131, N = 50 of 64); and closely related VREfm isolates (N = 129). Phylogenetically closely related isolates were found across study facilities, indicating that endemic ARO lineages have permeated local healthcare networks (Fig. 1). Patient characteristics played a dominant role in determining patient risk of ARO colonization on admission to a nursing facility. Only in the case of VREfm was a hospital significantly associated with colonization after adjustment for covariates (Table 1). **Conclusions:** ARO lineages were widely disseminated and colonization of specific ARO lineages at nursing facility entry could not be attributed to recent exposure to a specific ACH. Thus, for the ARO lineages studied here, a broader transmission system crosses ACHs, nursing facilities and probably the community. Therefore, the best indicators of ARO colonization were patient clinical characteristics, particularly poor functional status and antibiotic exposure. These findings suggest that intervention efforts targeting patients with characteristics associated with ARO colonization may help limit further spread among regional facilities.

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Barriers and Facilitators to Improving Hospital Cleanliness in a Brazilian Hospital

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Background: Antimicrobial resistance is a global public health threat. Integrated actions are necessary to reduce multidrug-resistant organisms (MDROs) in healthcare settings, including antimicrobial stewardship, infection prevention measures, and optimal environmental hygiene. We developed a project to improve hospital hygiene that involves 3 phases: (1) diagnostic, compounded by assessment of cleanliness and identification of barriers and facilitators for environment cleanliness improvement; (2) intervention, based on review of structure and processes followed by a training program focused on major weaknesses identified; and (3) evaluation, impact of the intervention assessment. **Objectives:** We performed group interviews to identify barriers and facilitators for improving environment cleanliness. **Methods:** The project was performed by the infection control team and the housekeeping manager in a 350-bed, private hospital located in the city of São Paulo (Brazil). Two group interviews were conducted, one involving supervisors and the other involving housekeeping cleaners. All professionals were invited to participate. A semistructured questionnaire was used to guide the discussion, which was compounded by the following topics: working process, availability of human and material resources, training on institutional norms and routines, perception regarding work conditions, and quality of cleanliness. **Results:** In total, 33 professionals attended the interviews: 12 were supervisors and 21 were housekeeping cleaners. The

main facilitator identified was a good perception by the housekeeping team regarding the project. We identified several sets of barriers: (1) human resources, such as supervisor executing the cleaning, inadequate sizing of human resources in shifts, reduced scale on Sunday and holiday shifts, and lack of professional replacement for sick leave and vacation; (2) supplies and equipment, such as torn bed linen, insufficient mops, centralized and inadequate dilution of sanitizers causing delays and impacting quality of hygiene; (3) education, such as lack of training program perceived by supervisors (management) and housekeeping cleaners (basic procedures for cleaning) and knowledge regarding who cleans what; (4) motivation and relationships, such as supervisor perceptions that housekeeping cleaners are unmotivated, and this causes absenteeism. The team feels that they are disregarded by doctors, and they have relationship problems with nursing and hospital engineering staff. Also, they are afraid of being physically assaulted by coworkers. Finally, professionals reported the perception that the hospital is not clean enough and that this is related to the short time goals imposed on the staff. **Conclusions:** The main barriers identified were related to education strategies and management of human and material resources. The results will support the intervention phase.

Presentation Type:
Poster Presentation
Beyond Bundles in Prevention of CAUTI and UTI's

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Background: Urinary tract infections (UTIs) are common healthcare-associated infections. Evidenced-based practice (EBP) successes of catheter associated urinary tract infection (CAUTI) bundles has resulted in rates decreasing >50% in community-based nursing homes. The South Texas Community Living Center (CLC SA), our 42-bed long-term care and rehabilitation center, conducts routine infection prevention surveillance. During routine surveillance, the infection prevention team noticed an increase in UTI percentages and CAUTI rates. Thus, we sought to increase compliance with standard CAUTI bundles, and we implemented an intervention called the "bladder bundle." **Methods:** A multidisciplinary team (ie, infection preventionist, clinical nurse leader, simulation director, educator, leadership and frontline staff champions) identified and evaluated practices through documentation of audits and safety rounds during April and May of 2017 (FY19 QTR 3). The comprehensive bladder bundle was initiated in June 2017, based on EBP interventions and included education for staff with audit and feedback. The team reviewed the literature and expanded the bladder bundle to include a comprehensive urinary note and oral hydration program for the veterans in addition to the standard CAUTI bundles (ie, minimize catheter use, use with appropriate indications, consider alternatives to catheters, proper insertion and securement). In May 2018, a facility-wide, hospital-wide initiative focused on a new urinary catheter insertion kit, insertion competencies and perineal care to improve outcomes. This initiative was
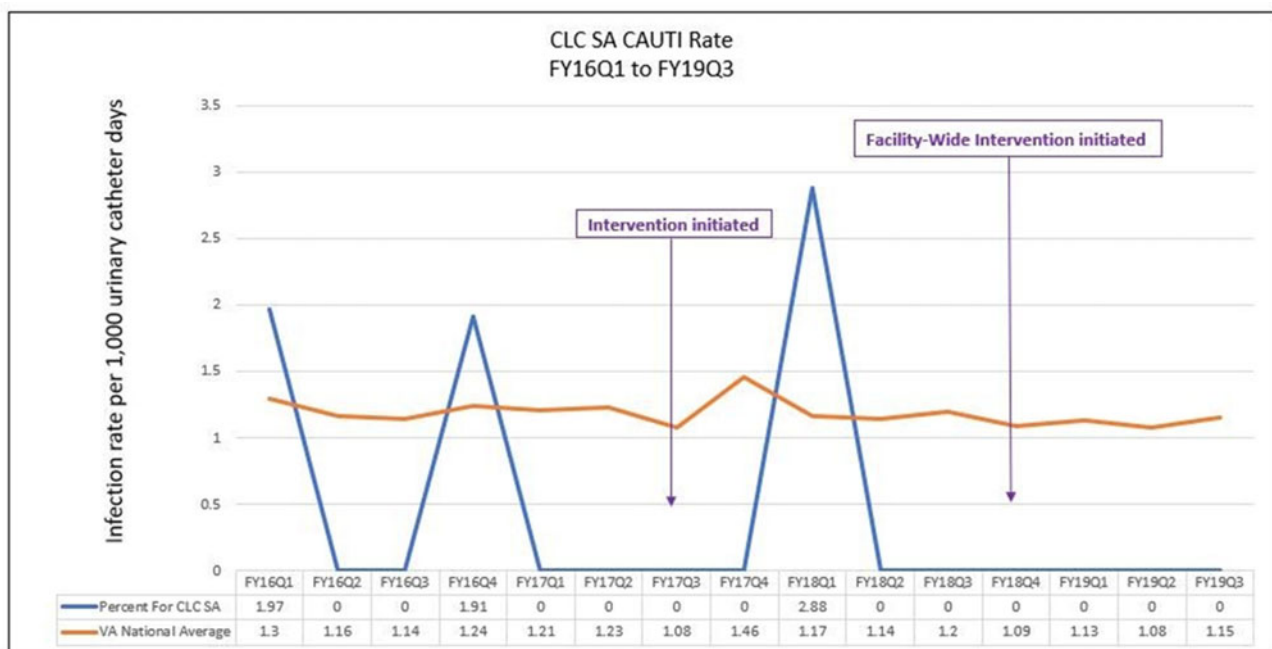

Fig. 1.