

	Baseline		Intervention						Results	
	Period 1	Period 2		Period 3		Period 4		Period 5		
Micro-Burdens	CFUs	CFUs	% Reduction from Baseline	Average % Reduction from Baseline						
Bacteria	16	7	56%	6	63%	6	62%	6	63%	61%
Fungi	5	3	40%	1	80%	1	80%	1	80%	70%

Fig. 1.

Pathogens	Baseline		Intervention						Results	
	Period 1	Period 2	% Reduction from Baseline	Period 3	% Reduction from Baseline	Period 4	% Reduction from Baseline	Period 5	% Reduction from Baseline	Average % Reduction from Baseline
MRSA (Positive Locations)	16	7	56%	6	63%	6	62%	6	63%	61%
VRE (Positive Locations)	5	3	40%	1	80%	1	80%	1	80%	70%

Fig. 2.

Background: Pathogens that remain on healthcare surfaces after standard cleaning have been reported to cause 10%–30% of all healthcare-associated infections among admitted patients. The study reported here evaluated the effect of a continuous application of low-level gaseous hydrogen peroxide (H₂O₂) on microbial surface contamination in a pulmonary specialty unit (PSU) of a large magnet-designated urban hospital. **Methods:** A baseline surface contamination level was measured by obtaining cultures of 5 high-touch points in 8 patient rooms, a nurse's station, and a nurse's charting room to determine the bacterial and fungal microbial burden levels (period 1). No revisions to cleaning practices were made during any period. Also, 8 continuous decontamination devices were installed in the HVAC near the area to be treated. The devices convert humidified air into predominately H₂O₂, which then exited the ducts, covering all surfaces. Environmental sampling was conducted every 4 weeks for 4 months after activation to measure the effects on the intrinsic microbial burden on surfaces as well as the incidence of MRSA and VRE (periods 2–5). In addition, the unit manager tracked the level of absenteeism of employees in the PCU during the trial to compare results to the same 4-month period from the prior year. **Results:** In concert with regular cleaning and disinfecting practices, the average bacterial microbial burden levels found on 52 locations prior to the activation of the devices were 6,446 CFU/100"2. Incidence of MRSA and VRE were 31% and 10%, respectively. During the intervention, the levels of both bacterial and fungal microbial burden on surfaces were significantly lower, as was the incidence of MRSA and VRE. The continuous application of low-levels of oxidizing molecules exerted a significant 78% and 97% reduction in the average bacterial and fungal microbial burden found on PSU surfaces (1,415 CFU/100"2 and 328 CFU/100"2 for bacteria and fungi, respectively). The incidences of MRSA and VRE on surfaces were reduced by 63% and 70%, respectively. In addition, the unit manager reported a significant decline in absenteeism, with a reduction of 550 hours (1,313 vs 752) during the 4-month trial versus the same 4-month period the previous year. **Conclusions:** The introduction of continuous low-level gaseous H₂O₂ on all surfaces throughout a PSU reduced the overall bacterial and fungal microbial burden

as well as lowered the incidence of both MRSA and VRE on surfaces, and it reduced employee absenteeism, providing a potentially safer environment for patients, staff, and visitors.

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Poster Presentation

Evaluation of Initial Outcomes of an Antimicrobial Stewardship Program in a Nonprofit Hospital in Brazil

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Background: One of the main global public health challenges is the fight against microbial resistance, according to the World Health Organization. Inadequate use of antimicrobials is considered one of the main factors related to the phenomenon and is quite common in the hospital environment. Managing the use of antimicrobials in hospitals has become a necessity and has shown positive results in many ways, such as maximizing the effects of pharmacotherapy, preventing the emergence of resistant microorganisms, and reducing healthcare costs. **Methods:** The prescriptions for patients admitted to a 380-bed nonprofit private hospital in Belo Horizonte, Brazil were monitored from January 1, 2019, to August 31, 2019, with a monthly average of 251 patients followed by the antimicrobial stewardship (AMS) team (1 infectious diseases doctor and 2 clinical pharmacists). Patients selected for follow-up and intervention were those submitted to intravenous, intramuscular, and/or oral antibiotic therapy with the following antimicrobial agents: piperacillin/tazobactam, carbapenem, polymyxin B, tigecycline, vancomycin, teicoplanin, daptomycin, third- and fourth-generation cephalosporins, quinolone, and aminoglycosides. Patients on prophylactic or antimicrobial treatment not mentioned above were excluded from surveillance. Interventions were dose adjustments, drug adjustment by culture results,

intravenous to oral treatment switch, and discontinuation of therapy. **Results:** There were 318 interventions, and 64.82% of the interventions performed by the AMS team were accepted by prescribers. The interventions provided a total savings of BR\$ 119,706 (~US\$30,000) in direct antimicrobial spending. Correlating the interventions with the defined daily dose (DDD) measurement and comparing data from the same period in 2018, we detected a reductions in the consumption of several antimicrobials: ceftriaxone (25.6%), ciprofloxacin (45.7%), meropenem (34%), piperacillin/tazobactam (12.7%), teicoplanin (18.8%), vancomycin (20.6%), cefepime (23.9%) and polymyxin B (26%). We also detected reductions in days of therapy (DOT) for most of these drugs, such as polymyxin B, with an average reduction of 2 DOT. **Conclusions:** Reducing antimicrobial use is one of the key strategies for avoiding unnecessary exposure and selective pressure leading to the emergence of resistant microorganisms. The measured data point to a favorable trend in the rational use of antimicrobials in our institution with simple interventions. The results presented were used to reaffirm the importance of the AMS team in our institution. More data on length of stay, indirect costs, reduction of side effects, mortality, and occurrence of microbial resistance should be made.

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Evaluation of Novel “No-Touch” Technologies for Decontamination of Toys in Pediatric Healthcare Settings

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Background: Toys in playrooms are often shared among patients in pediatric healthcare settings; they can present a risk for transmission of bacterial and viral pathogens. Effective cleaning and disinfection of toys using disinfectant wipes is labor intensive and difficult due to irregular surfaces. **Methods:** We conducted a point-prevalence culture survey to determine the frequency of contamination of in-use toys and high-touch surfaces in playrooms in a pediatric healthcare facility with methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci (VRE), and *Clostridioides difficile*. Using a variety of toys inoculated with pathogens, we evaluated efficacy and ease-of-use of 3 novel “no-touch” technologies: (1) an electrostatic sprayer, (2) a small ultraviolet-C (UV-C) box (18.9 × 9.9 × 1.8 inches) for smaller toys, and (3) a high-level disinfection cabinet using ultrasonic submicron droplets of peracetic acid and hydrogen peroxide. Test pathogens included *C. difficile*, MRSA, and *Candida auris*. **Results:** Of 135 items cultured in playrooms, 6 (4.4%) were contaminated with MRSA, 1 (0.7%) was contaminated with VRE, and none were contaminated with *C. difficile*. Each of the technologies reduced all pathogens by >4 log₁₀ CFU on all types of toys tested (plastic, soft rubber, and tablet). The electrostatic sprayer was considered the easiest to use by all users because large numbers of toys could be processed much more quickly (ie, spray for 20 seconds and allow to air dry) than with disinfectant wipes. The disinfection cabinet required 21 minutes for cycle completion, whereas the

decontamination cycle for the UV box was only 30–90 seconds but with limited capacity to hold toys. **Conclusions:** Three “no-touch” technologies were effective for disinfection of toys contaminated with healthcare-associated pathogens. The electrostatic spray application of disinfectant was considered the easiest to use for rapid decontamination of toys.

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Evaluation of Patient Risk Factors for Carbapenemase-Producing Organism Colonization

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Background: Carbapenemase-producing organisms (CPOs) are a growing antibiotic resistance threat. Colonization screening can be used to identify asymptotically colonized individuals for implementation of transmission-based precautions. Identifying high-risk patients and settings to prioritize screening recommendations can preserve facility resources. To inform screening recommendations, we analyzed CPO admission screens and screening conducted on point-prevalence surveys (PPSs) performed through the Antibiotic Resistance Laboratory Network’s Southeast Regional Laboratory (SE AR Lab Network). **Methods:** During 2017–2019, the SE AR Lab Network collected data via a REDCap survey for a subset of CPO screens on a limited set of easily determined patient risk factors. Rectal swabs were collected and tested with the Cepheid Carba-R. Specimens collected within 2 days of admission were classified as admission screening and the remainder were classified as PPS. Index cases were excluded from analyses. Odds ratios (ORs) and 95% confidence intervals were calculated, and a value of 0.1 was used for cells with a value of zero. **Results:** In total, 520 screens were conducted, which included 366 admission screens at 2 facilities and 154 screens from 27 PPSs at 8 facilities. CPOs were detected in 14 (2.7%) screens, including in 10 (2.7%) admission screens and in 4 (2.6%) contacts during PPSs; carbapenemases detected were *Klebsiella pneumoniae* carbapenemase (KPC) (n = 12), New Delhi Metallo-β-lactamase (NDM) (n = 1) and Verona Integron-Encoded Metallo-β-lactamase (VIM) (n = 1). One long-term acute care hospital (LTACH) performed universal admission screening, which accounted for 96% of admission screens and all 10 CPOs detected by admission screening. Mechanical ventilation (OR, 5.0; 95% CI, 1.4–18.0) and the presence of a tracheostomy (OR, 5.4; 95% CI, 1.5–19.4) were associated with a positive admission screen. Moreover, 8 facilities conducted PPSs: 4 acute care hospitals, 2 long-term acute care hospitals, and 2 nursing homes. CPO prevalence in long-term acute care hospitals was 4.8% (2 of 42), 2.4% (1 of 41) in acute care hospitals, and 1.5% (1 of 69) in nursing homes. Requiring assistance with bathing (OR, 4.8; 95% CI, 1.6–8.0) and stool incontinence (OR, 16.6; 95% CI, 13.4–19.8) were associated with a positive screen on PPSs. All 7 roommates of known cases tested negative for CPO colonization.