(96%). The frequency of effective cleaning of high-touch surfaces in occupied patient rooms significantly improved following education (Table).

Conclusion. A novel educational program, designed using adult learning theory, that addressed ESW's self-identified challenges was well-received and appears to have resulted in learning, behavior change, and improved daily cleaning. Future research will assess program sustainability and long-term impact on hospital cleanliness and patient outcomes.

	Percentage of surfaces identified as clean (%)		
Surface	Pre-intervention	Post-intervention	*Absolute % change*
Toilet seat	85	88	3
Toilet flush	60	82	22
Overbed table	29	87	58*
Bed rail	8	50	42*
Call box	5	65	60*
Visitor chair	0	59	59*

*$P < 0.05$.

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502. *Sphingomonas* Infections Arising from Hospital Plumbing Fixtures

Caroline J. Zellmer, B.S.[1]; Angela V. Michelin, M.P.H.[1]; Ryan C. Johnson, PhD[2]; John P. Dekker, MD, PhD[3]; Karen M. Frank, MD, PhD[4]; David K. Henderson, MD[1]; Anna F. Lau, PhD[4]; Julia A. Segre, PhD[2] and Tara N. Palmore, MD[1]; [1]Hospital Epidemiology Service, NIH Clinical Center, NIH, Bethesda, Maryland, [2]National Human Genome Research Institute, NIH, Bethesda, Maryland, [3]Department of Laboratory Medicine, National Institutes of Health Clinical Center, Bethesda, Maryland, [4]Department of Laboratory Medicine, NIH Clinical Center, NIH, Bethesda, Maryland

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Background. Following a rise in nosocomial infections due to *Sphingomonas*, a waterborne Gram-negative organism, we undertook an epidemiological investigation to identify possible sources and develop a remediation strategy.

Methods. We analyzed *Sphingomonas* isolates from 30 inpatients in the past 11 years, and we reviewed each patient's chart. We collected swabs of faucets, water samples, and free and total chlorine levels from rooms of *Sphingomonas* patients from 2016, using unrelated rooms as controls. Water samples and chlorine levels were collected from hospital pipes. Swabs were placed into 1 mL TSB and cultured to sheep blood agar. Isolates were identified by MALDI-TOF MS. Water samples were tested via membrane filtration (500 mL) and spread plate method (1 mL). Patient and environmental *Sphingomonas* isolates underwent whole genome sequencing, and were analyzed with Mash and Snippy for overall genomic sequence and single-nucleotide polymorphisms comparisons, respectively, to assess relatedness.

Results. Of 27 faucets examined, 59% grew *Sphingomonas* spp., and 33% grew highly-resistant *S. koreensis*. Of 21 water samples, 76% grew *Sphingomonas* spp., and 48% grew *S. koreensis*. Sequence analysis demonstrated strong genetic similarity among *S. koreensis* clinical isolates from the past 11 years and recent faucet and water isolates. One patient's *S. koreensis* isolate was genetically related to isolates from faucets in his room. *Sphingomonas* did not grow from samples collected from municipal water or some of the far upstream water pipes within the hospital.

Free chlorine levels were extremely low in hot water, leading to a program of flushing in order to restore and maintain adequate levels. Among 7 contaminated faucets that were replaced, 3 became recolonized within 4 weeks, and continued to grow *Sphingomonas* from water.

Conclusion. Investigation and genome sequencing suggest long-standing *S. koreensis* colonization within the hospital plumbing system that has served as a reservoir for sporadic infections among immunosuppressed patients. Remediation of *Sphingomonas* plumbing contamination is an ongoing challenge guided by few published data. Hospital water must be rendered safe for even the most immunosuppressed patients.

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503. Implementation of Cleaning Process for Mobile Patient Equipment

Sara Reese, PhD, CIC, FAPIC[1]; Christy Lequire, BSN[2]; Tina Van Winks, BSN, CMSRN[3]; Jennifer Bonn, BSN, RN[3]; Bryan Knepper, MPH, MS, CIC[1] and Heather Young, MD[4]; [1]Patient Safety and Quality, Denver Health Medical Center, Denver, Colorado, [2]Department of Nursing, Denver Health Medical Center, Denver, Colorado, [3]Nursing Services Medical/Surgical, Denver Health Medical Center, Denver, Colorado, [4]Infectious Diseases, Denver Health Medical Center, Denver, Colorado

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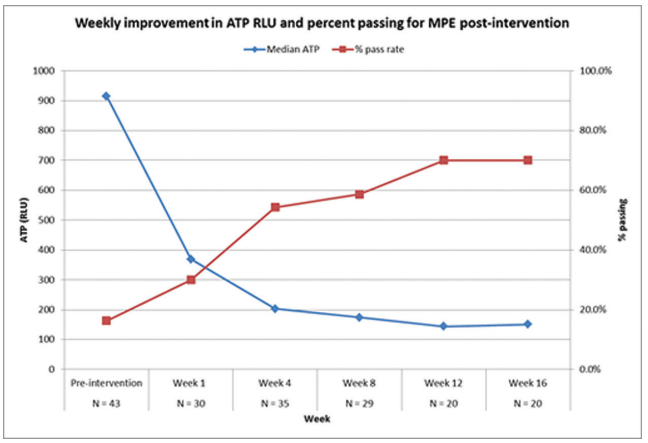
Background. Mobile patient equipment (MPE) such as Dynamap machines (i.e., blood pressure monitoring devices, thermometer and pulse-oximeter), ultrasound machines, electrocardiogram (EKG) bladder scanners and language line translator phones may be significant fomites for the transfer of infections between patients in acute care settings. Baseline adenosine triphosphate (ATP) data from a Level 1 Trauma Center suggested that MPE are not cleaned regularly between patients. The objective of this quality improvement project was to implement a standardized, effective cleaning process for MPE and monitor success of implementation through the use of ATP monitoring and real-time data feedback.

Methods. A detailed cleaning process and schedule was developed MPE. Education was provided to staff on between use cleaning and an extensive cleaning process to be performed once daily. Cleanliness of MPE was tested through weekly ATP monitoring and the results were provided to floor educators and managers. Median ATP and passing rate were assessed. ATP pass/fail cut-off was set according to manufacturer's recommendations. Passing ATP level was <250 relative light units (RLU), intermediate level was 250–500 RLU and failing level was >500 RLU.

Results. The overall median ATP level of all MPE decreased from 755 RLU ($N = 102$) to 236 RLU ($N = 425$) 16 weeks post-intervention (Figure 1). The pass rate increased from 19.6% to 52.0%. The blood pressure cuff ATP level demonstrated a 78% decrease from 969.5 RLU ($N = 12$) to 219 RLU ($N = 84$). The pulse-ox ATP level also decreased by 78% from 1884 RLU ($N = 9$) to 407 RLU ($N = 86$) post-intervention. An 84% reduction in ATP level was identified in the language line translator phone (1,284 RLU to 198 RLU).

Conclusion. Sixteen weeks post-implementation of this quality improvement project demonstrated that patient equipment is consistently being cleaned and the ATP levels are being maintained at a low level. Future directions include broadening the type of equipment that are assessed through ATP, expanding this project to outpatient settings and exploring the sustainability in the absence of ATP data feedback. The improvement of the cleanliness of the equipment potentially has the impact of decreasing infections throughout the hospital.



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504. Developing an Outpatient High-level Disinfection Competency Program

Fozia Steinkuller, MPH, CIC[1]; Karen J. Vigil, MD[2]; Kristofer Harris, MPH, RN[1] and Luis Ostrosky-Zeichner, MD, FIDSA, FSHEA[3]; [1]UT Physicians, Houston, Texas, [2]The University of Texas Health Science Center at Houston, Houston, Texas, [3]Division of Infectious Diseases, Department of Internal Medicine, McGovern Medical School, Houston, Texas

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Background. Breaches in reprocessing reusable instrument through high level disinfection (HLD) can result in transmission of infections. Cleaning followed by high-level disinfection performed by qualified medical staff ensures that there is prevention of disease transmission among patients. Qualification of medical staff to reprocess the instruments includes education on the transport, cleaning, disinfection, and storage of the semi-critical instrument according to manufactures instructions.

Methods. We created a competency program that included a didactic component and hands-on training to evaluate knowledge about high-level disinfection in 13 outpatient clinics. Sixteen specific questions regarding various key HLD topics including: quality control, preparation, expiration, policy knowledge, definition, instructions for use, and safety were used to test knowledge. Fifty-one trainees completed a pre and posttest to evaluate efficacy of the competency program.

Results. The outlying lowest scored questions in the pre-test were about quality control and expiration. Test strip solution preparation (40%), expiration (37%), frequency of testing the test strip bottle (54%), and the time required before test strips can be read (13%) were frequently missed questions. Knowledge gaps associated with the disinfectant were disinfectant expiration once opened (33%), appropriate disinfectant temperature (31%) and how often the solution needs to checked (44%. In the post test the two frequently missed questions were about appropriate disinfectant temperature (85%) and the frequency of testing the test strip bottle (77%). After the training the overall mean score improved from 61% on the pretest to 94% on the posttest (p value <0.0001) CI (95% CI: 28.0, 37).Overall HLD practices were 62% pre training and improved to 94% post training.

Conclusion. Our evaluation indicates pre competency training participants were not proficient and had knowledge gaps. There was a significant improvement in scores indicating the competency program was effective in closing high-level disinfection