Hand-hygiene compliance was captured via secret-shopper methods and ≥75% used as the cut-off for meeting compliance goals. Unit-aggregated survey responses were compared between units that did vs. did not meet SIR, SUR goals for the year, and HH goals for the quarter, prior to survey distribution, using two-sample t-tests.

Results. Fewer HCW on low-HH compliance units (i.e., <75%; n = 179 units) responded positively to questions pertaining to overall perception of safety, frequency of events reported, supervisor/manager expectations/actions promoting safety, organization learning, teamwork within units, communication openness, and nonpunitive response to errors, than HCW on high-compliance units (i.e., >75%; n = 69 units; P < 0.05). More HCW on units with CAUTI SIR <1 (n = 40 units) responded positively to supervisor/manager expectations/actions promoting safety and teamwork within units, than HCW units with SIR 21 (n = 22; P < 0.05). We observed no associations between CLABSI SIR performance and AHRQ safety survey responses.

Conclusion. HCW perceptions of unit safety culture can be associated with HAIs and HH compliance performance. Unit performance/compliance was most commonly associated with supervisor/manager expectations suggesting a key managerial component to promoting safety culture.

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458. Using a Humanoid Robot to Improve Hand Hygiene Compliance

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Background. In a similar way that the Aedes aegypti mosquito is a vector for diseases such as dengue fever, and Zika, healthcare workers can be vectors for hospital infections! Despite the fact that handwashing is the single most effective measure to prevent the transmission of disease, make handwashing a habit among healthcare workers remains a major challenge. Here we investigated whether or not it is possible to adapt a toy robot as a tool for continuous education of healthcare workers in the context of hand hygiene compliance. The objective was to answer two questions: (a) How to adapt a robot as a Meccano G15KS to be an instrument of health training and continuous education of healthcare workers? (b) What is the effectiveness of the use of a humanoid robot on the compliance with hand hygiene?

Methods. We got to adapt a toy programmable robot named Oziros, as an instrument of health training to improve the compliance with hand hygiene. The robot was adapted with mini projector, spy camera, an automatic alcohol hand sanitizer dispenser, a cell phone and a cell phone support and an audio amplifier. Oziros, accompanied by infection control practitioners, performs short video lecture presentations and own reports of the institution's data regarding infections and the hand hygiene rate, working from 10 to 15 minutes in each target sector.

Results. After the insertion of Oziros in three ICU's, hand hygiene rate increased from about 36%, between January and July; to 65% in August-November 2016. In all months of 2017, consumption of alcohol preparation remained above 20 mL/patient-day, the minimum expected consumption recommended by the World Health Organization.

Conclusion. We succeeded in adapting a toy robot as instrument of continuous education of healthcare workers, creating a new education tool, the robot tutor. Hand hygiene compliance raised significantly after the intervention. We also achieved a consumption of alcohol preparation rate above the minimum expected rate by WHO, sustained and durable. With the continuing education approach based on Oziros, it is not necessary to withdraw healthcare workers from their work area, which can be a novel education strategy, more interactive, that can really personalize health education.

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459. Patient-Based Surveys to Better Understand Patients' Perceptions of Healthcare Providers' Hand Hygiene Practices and If Patient Responses Validate Secret Observers' Hand Hygiene Compliance Reporting

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Background. Hand hygiene (HH) is one of the simplest and most effective methods to decrease healthcare-associated infections (HAIs). However, in outpatient settings, it is difficult to audit HH practices as patient-healthcare provider (HCP) interactions take place behind closed doors. Within our system, secret observers (SO) monitor HCP HH, which is routinely reported at near 100%. We wished to determine patient's perceptions of their HCP's HH and see how well it matched SO HH observations.

Methods. We developed an anonymous two-question survey which queried patients if their HCP performed HH upon entering and exiting the room. Both questions had a three-choice/one answer categorical responses choices: yes (no) (I didn't notice/I do not remember). The survey took place at two large outpatient facilities with multiple medical subspecialties, primary care groups, and surgical specialties. The facilities were surveyed in October 2017 and March 2018, respectively. No patient or HCP-specific identifiers were obtained through the surveys.

Results. A total of 1,268 surveys were collected over two separate time periods. Overall, HCP HH compliance was high both upon room entry and exit (90.4% and 87.4% "yes" responses, respectively). Our SO HH observation compliance was 98% during these periods. Orthopedics was the top performing subgroup (289/301, 96.0% and 285/301, 94.7% HH on entry and exit). The immediate care center was the lowest performing subgroup (135/171, 79.0% and 132/171, 77.2% HH on room entry and exit), with other groups' (primary care medicine, subspecialty medicine, women's health, Ears-Nose-Throat, ophthalmology, rehabilitation, psychology, and pain clinic) HH practices falling somewhere in between.

Conclusion. HH practices can be used as for positive reinforcement for the highest achieving practices, and to challenge poorer performing groups to improve their HH practices. Using patient-based audits of HCPs HH practice is a viable alternative method of HH compliance data collection/monitoring.
protect themselves and our patients, and reduce HAIs. Increasing EVS leadership commitment was key to further engage EVS staff and encourage better HH amongst EVS staff. Review of HH metrics was hard wired into the daily functions of the EVS department.

**Results.** Figure 1 shows EVS HH compliance from January 2014 through October 2017. This highlights the substantial progressive, albeit slow, improvement in EVS HH practices from a baseline of 40% to 60% to 80% over the course of nearly 4 years.

**Conclusion.** EVS HH rates remained suboptimal for prolonged periods. Initially the lack of leadership commitment and high staff turnover made training and engagement difficult. Continued interventions and use of just-in-time coaching proved to be effective to help improve compliance and better understand barriers to best practices. Connecting with EVS staff in small group huddles and the engagement of EVS leadership was key to success.

**Figure 1 – Hand Hygiene Compliance by Healthcare Worker Type**

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461. Electronic Hand Hygiene Compliance Monitoring Systems: Not All Are Created Equal
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**Background.** While direct observation is considered the gold standard for hand hygiene (HH) surveillance, there is a growing interest in the implementation of electronic monitoring systems, which claim to accurately capture individual-level HH performance.

**Methods.** Two types of electronic hand hygiene monitoring systems (EHHMS) were trialed at an 865-bed, academic medical center over an 18-month period. Each type of EHHMS was piloted in two inpatient units, and hospital employees who had contact with patients and/or the patient environment were eligible to participate. In each trial, participants received standard training and were then asked to wear EHHMS badges while continuing their normal workflow. Methods of assessment included regular review of EHHMS reports, an inter-rater reliability analysis to compare EHHMS to direct observation by trained HH observer, and a qualitative electronic survey to assess the acceptability of EHHMS. HH compliance goal was set at 90%.

**Results.** In the first pilot, 279 employees volunteered to trial Type A EHHMS for 14 weeks, with an overall HH compliance of 30% (87,688 opportunities). In the second pilot, 169 employees volunteered to trial Type B EHHMS for 12 weeks, with an overall HH compliance of 93% (363,272 opportunities). Voluntary survey response rate for Type A was 32% (90/279) and for Type B was 46% (77/169). The majority of respondents consistently used EHHMS in daily workflow (Type A: 82%, 68/83) (Type B: 82%, 55/67) and most did not feel apprehensive about using the EHHMS (Type A: 19%, 16/83) (Type B: 22%, 15/67).

**Conclusion.** Type B EHHMS captured our healthcare workers’ HH performance during clinical workflow with a greater accuracy and more HH events than Type A. EHHMS may provide an alternative method to capture HH compliance in the healthcare setting. Hospitals considering the use of an EHHMS should assess the technology’s ability to accurately capture HH performance in the clinical workflow prior full housewide implementation.

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462. “All Eyes on You”: A Covert Observational Study on Contact Precaution Compliance in Six Hospitals at the Detroit Medical Center
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**Background.** The Center for Disease Control and Prevention recommends strict contact isolation precautions (CP) that include hand hygiene (HH) and barrier (gloves and gown) precautions upon entering and leaving the rooms of patients diagnosed with multidrug-resistant organism or Clostridium difficile infections. Although this policy has been in place for several years, compliance rate among HCWs is rarely studied. The aim of our study was to covertly monitor, analyze, and compare the overall bundle compliance (OBC) and individual (HH, glove and gown) component compliance (ICC) among HCWs during routine patient care.

**Methods.** A prospective observational study was done in six Detroit Medical Centers (July 2017 to February 2018). Trained observers audited both inpatient and intensive care units on random days and time. Components audited (1) HH before donning and after doffing (2) gowning and gloving techniques before entering and after existing the patient room. A mobile application (speedy audit) was used to record all data. A pilot targeted education program (TEP) was also conducted in one of the hospitals where education was focused only on strict HH practice before donning.

**Results.** A total of 6,274 observations were collected. The OBC was 38%. Common HCWs observed included nurses (registered nurse and nursing student)