

### 1329. Alcohol-based Hand Rubs Are Effective for Reduction of Multi-Drug Resistant *Candida*

Sarah Edmonds-Wilson, MS, CCRP<sup>1</sup> and Alyssa Yeik, BS<sup>2</sup>; <sup>1</sup>GOJO Industries, Akron, Ohio, <sup>2</sup>BioScience Laboratory, Bozeman, MT

**Session:** 151. HAI: Hand Hygiene  
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**Background.** Hand hygiene is one of the most important measures for preventing the spread of infection. However as new, multi-drug resistant organisms emerge there is the question as to whether marketed products are effective against them. Multi-drug resistant *Candida auris* (MDRCA) was first reported as an infectious agent in humans in 2009 and has since been implicated in a growing number of infections. In June 2016 the US CDC issued a clinical alert to healthcare facilities warning of the potential for MDRCA transmission and infection within healthcare facilities and the importance of infection control measures. To date, data on the effectiveness alcohol-based hand rubs (ABHRs) against MDRCA has been lacking. The objective of the study was to test the fungicidal efficacy of three commercial ABHRs against MDRCA.

**Methods.** Three test products, two ABHR foams and one gel, each containing 70% ethanol, were evaluated for fungicidal activity against MDRCA (AR-Bank #0390) using an *in vitro* time kill method (ASTM E2783-11). Reductions of the microorganism were determined following exposure to test products for 15 and 30 seconds.

**Results.** Each of the three ABHR achieved complete reduction, 6.7889 log<sub>10</sub> (≥99.9999%) of MDRCA at the 15 and 30 seconds exposure times.

**Conclusion.** Health care workers should continue to use ABHRs as indicated for preventing the transmission of infection. This data indicates these products effectively kill MDRCA, and further highlights the importance of compliance with hand hygiene guidelines in healthcare settings.

**Disclosures.** S. Edmonds-Wilson, GOJO Industries: Employee, Salary

### 1330. Reducing Dissemination of Viruses from Computer Touchscreens through Patient Hand Hygiene and an Automated Ultraviolet-C Touchscreen Disinfection Device

Heba Alhmidi, MD<sup>1</sup>; Jennifer Cadnum, BS<sup>2</sup>; Christina Piedrahita, BS<sup>1</sup>; Amrita John, MBBS<sup>3</sup> and Curtis Donskey, MD<sup>4</sup>; <sup>1</sup>Research Service, Louis Stokes Cleveland VA Medical Center, Cleveland, Ohio, <sup>2</sup>Research Service, Cleveland VA Medical Center, Cleveland, Ohio, <sup>3</sup>Infectious Diseases and HIV Medicine, University Hospitals Case Medical Center, Cleveland, Ohio, <sup>4</sup>Case Western Reserve University, Cleveland, Ohio

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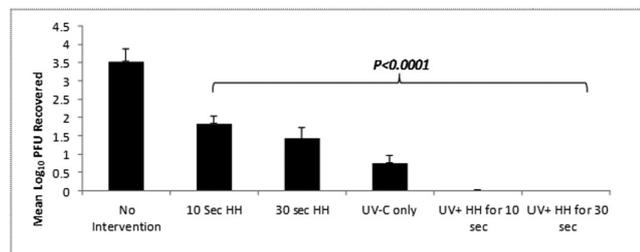
**Background.** Computer touchscreens in patient waiting areas are a potential source for spread of viral and bacterial pathogens in healthcare facilities. Patient hand hygiene is recommended to prevent acquisition of pathogens on hands.

**Methods.** We tested the efficacy of patient hand hygiene alone or in combination with a novel automated ultraviolet-C (UV-C) touchscreen disinfection device for reduction in dissemination of the nonpathogenic non-enveloped virus bacteriophage MS2 from contaminated touchscreens. Subjects randomized to control, alcohol hand sanitizer (10 or 30 second application), UV-C (30-second cycle), or alcohol hand sanitizer plus UV-C contacted 4 sites routinely used during operation of the touchscreen and then fingerpads were cultured. The log plaque-forming units (PFU) recovered were compared for each group. Patients were observed to determine the frequency of hand hygiene after use of a touchscreen in a waiting area.

**Results.** As shown in the figure, the mean log<sub>10</sub> PFU of bacteriophage MS2 recovered from fingerpads was significantly reduced by each of the interventions ( $P < 0.001$ ). However, only the combination of hand hygiene and UV-C was effective in completely preventing virus transfer. Of 20 patients observed in a waiting area, 0 (0%) used hand sanitizer that was available adjacent to the touchscreen.

**Conclusion.** Our results suggest that use of alcohol hand sanitizer alone or in combination with an automated UV-C touchscreen disinfection device could reduce transmission of viruses from contaminated touchscreens. There is a need for education of patients on the importance of hand hygiene after contact with touchscreens.

Figure. Efficacy of hand hygiene (HH) and/or UV-C in reducing recovery of bacteriophage MS2 from fingers after contact with contaminated touchscreens



**Disclosures.** All authors: No reported disclosures.

### 1331. Comparison of Two Glove-Sampling Methods to Discriminate Between Study Arms of a Hand Hygiene and Glove-Use Study.

Natalia Blanco, PhD<sup>1</sup>; Gwen L. Robinson, MPH<sup>1</sup>; Linda Otieno, MPH<sup>1</sup>; J. Kristie Johnson, PhD<sup>1</sup>; Shanshan Li, PhD<sup>2</sup>; Soraya Chanyasubkit, MD<sup>1</sup>; Anthony D. Harris, MD, MPH<sup>1</sup> and Kerri A. Thom, MD, MS<sup>1</sup>; <sup>1</sup>University of Maryland School of Medicine, Baltimore, MD, <sup>2</sup>Indiana University Fairbanks School of Public Health, Indianapolis, Indiana

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**Background.** Our group will be assessing in a randomized trial whether the use of alcohol-based hand rub (ABHR) to clean non-sterile gloved hands (instead of performing hand hygiene (HH) and changing gloves) for the WHO 5 Moments of HH during a single patient encounter is an efficient and effective practice. In preparation for this future study and in the absence of a well-established gold standard, this pilot study aimed to identify an effective glove-sampling method with the ability to detect a difference between our two study arms.

**Methods.** Healthcare workers (HCWs) entering Contact Precaution rooms were recruited and randomized into the intervention arm (HCWs directed to clean gloves with ABHR at each opportunity) or the usual care arm (HCWs behavior is silently recorded at each opportunity). In both arms, HCWs' individual gloved hands were randomized then sampled, using both sponge stick and direct imprint methodology (Fig 1-2). The outcome of interest was total bacterial colony forming units (CFUs). A Wilcoxon rank-sum test was performed to compare the median distribution of CFUs recovered by each sampling method between study arms. Sampled gloved hands were also categorized by level of bacterial detection (0 CFUs vs. more than 0 CFUs). For each sampling method, the proportional difference between categories was analyzed using a Fisher exact test.

**Results.** 42 unique HCWs participated in the study (25 intervention, 17 usual care). For each HCW interaction an average of 3 HH moments were recorded. Using the direct imprint technique, the median CFUs in the intervention arm compared with the usual care arm were 2 vs. 31,  $P < 0.01$ . Using the sponge stick technique, the median CFUs were 1 vs. 6,  $P = 0.25$ . (Fig 3). Using the agar method, bacteria was detected on 16/25 (64%) of gloved hands in the intervention arm compared with 17/17 (100%) in the usual care arm ( $P < 0.05$ ). Using the sponge-stick method, bacteria was detected 16/25 (64%) of gloved hands in the intervention arm and on 15/17 (88%) in the usual care arm ( $P = 0.15$ ).

**Conclusion.** The direct imprint method is an effective method to discriminate between our intervention arms. In addition, this method is more affordable and less work-intensive in the lab and as a sampling method than the sponge-stick method.

Figure 1.

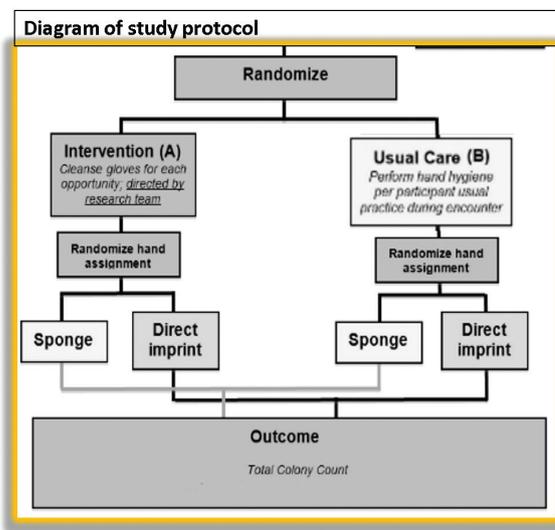
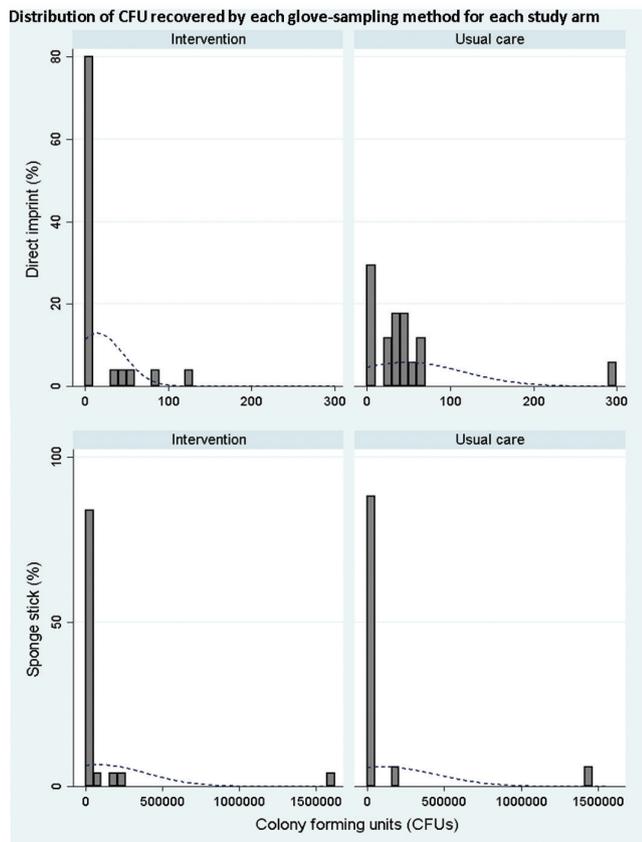


Figure 2.

### Common sampling methods

Sponge Stick		Direct Imprint	
✓	Covers more surface area	x	Covers less surface area
x	Performing takes a longer time	✓	Performing takes a shorter time
x	More intrusive	✓	Less intrusive
x	Longer processing time	✓	Shorter processing time
x	More expensive (\$50 to purchase & process)	✓	Less expensive (\$18 to purchase & process)

Figure 3.



**Disclosures.** A. D. Harris, CDC Epicenter Program: Grant Investigator, Grant recipient; K. A. Thom, AHRQ: Grant Investigator, Grant recipient

### 1332. An Appeal to Incorporate Hand Hygiene Education into Standard Elementary School Curriculum

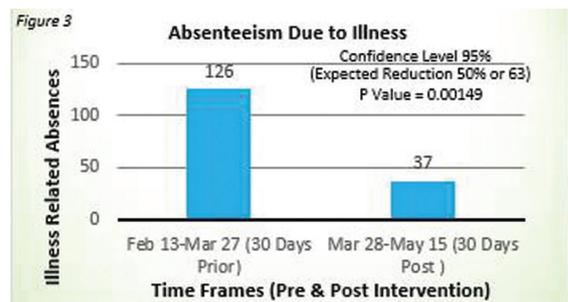
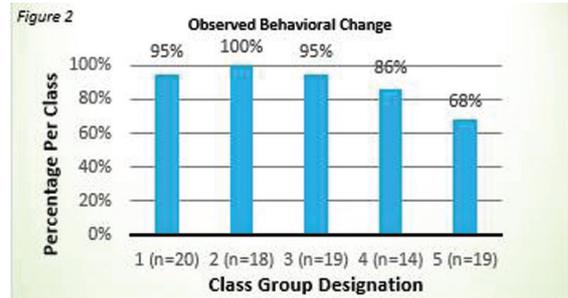
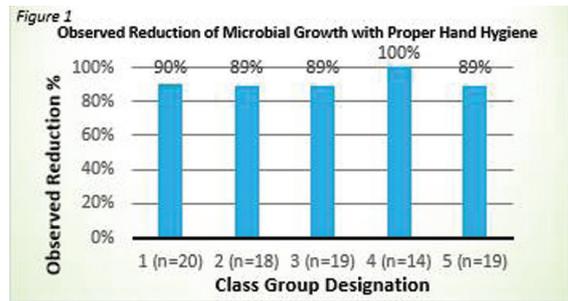
Jasmine Watson, BS, MPH<sup>1</sup>; Alexandria Owens, BS, CTBS<sup>1</sup>; Kavita Imrit-Thomas, DO<sup>1</sup>; Miranda Malone, BS<sup>1</sup>; Andy Tobias, AAS<sup>1</sup> and Lakshmi Goudar, MD<sup>2</sup>; <sup>1</sup>Lifenet Health, Virginia Beach, VA, <sup>2</sup>Sentara Medical Group, Virginia Beach, Virginia

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**Background.** The Center for Disease Control and Prevention reports that 160 million school days are lost each year due to infectious illnesses. Hand hygiene is one of the most effective ways to prevent illness that can lead to absenteeism among school-aged children, yet few schools have a formal education program as a preventative strategy.

**Methods.** A Pilot Hand Hygiene experiment was initiated for 90 second grade students at a Virginia Beach Public School. The experiment was designed to bring awareness and to satisfy a scientific module requirement. Students cultured their hands on general purpose agar plates with the assistance of physicians and a microbiologist. The proper hand washing technique was demonstrated. Students were equally divided into two groups: hand washing group and sanitizer group. They were instructed to re-culture hands after intervention. Students observed cultures for five days and documented results.

**Results.** Overall, student observation of decreased microbial growth was an average of 91% (Figure 1). Education improved compliance, which resulted in a favorable behavioral change on average of 89% (Figure 2). There was a 71% decrease in incidence of illness-related absences 30 days after the hand hygiene intervention (Figure 3). In three out of five classes, hand sanitizer was more effective when compared with hand washing. In addition, a random sample of cultures were incubated in a microbiology lab to identify the common microbes among the second-grade elementary school population. It revealed both resident and transient flora. Post-intervention, there was a rise in coagulase-negative Staphylococci resident flora. This indicated a successful decrease in transient flora, which is most likely to cause illness.



**Conclusion.** Hand Hygiene education is remarkably beneficial, especially in children who are at greater risk of illness. It is clearly effective in decreasing infectious disease risk, while teaching a life-long skill. For the impact as a preventative strategy to be felt, its implementation into elementary school curriculum is warranted.

**Disclosures.** All authors: No reported disclosures.

### 1333. The Use of Instructional Technology to Increase Independent Patient Hand Hygiene Practice of Hospitalized Adults in an Acute Care Setting

Shanina Knighton, PhD RN; Implementation Science, Louis Stokes Cleveland VA Medical Center, Cleveland, Ohio

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**Background.** Despite recognition that hospitalized patients carry pathogens on their hands and demonstrate poor hand hygiene practice, little attention has been given to interventions that increase hand hygiene practices. Studies that have attempted to improve patient hand hygiene practice lack sustainability due to dependability on healthcare staff, and no prior studies have tested ways to improve independent patient hand hygiene practice. One such approach is using a patient-centered multi-modal educational intervention and electronic voice-recorded reminder cue to promote self-management of hand hygiene.

**Methods.** This comparative effectiveness study tested two educationally-based approaches to improve patient hand hygiene in older adults hospitalized for 4 days for elective lower extremity orthopedic or podiatry surgery at a veterans' hospital. Group 1 ( $n = 41$ ) received an educational video, an educational handout and a voice-recorded electronic audio reminder (EAR) an active cue, which verbally reminded the participant to clean their hands 3 times a day (7am, 12 pm, 5pm). Group 2 ( $n = 34$ ) received the educational video and handout without the EAR. There were no significant differences between the two randomly assigned groups in terms of age, ethnicity and sex.

**Results.** Figure 1 shows the daily difference in product consumption Day 0 to Day 3. The average product consumption of ABHR (alcohol-based hand rub) in Group 1 (EAR) was 29.97 grams (SD 17.13). Group 2 (No EAR) averaged 10.88 grams (9.27) ( $P < 0.0001$ ). Comparing post-operative day (POD) 0 to POD 3, and controlling for covariates (Disability of Arm, Shoulder, and Hand [QuickDASH], Hand Grip Strength, Surgical Pain, MRSA in Nares, and Education), multivariate analyses indicated that the electronic audio reminder was a significant predictor ( $\beta = .468$ ) of ABHR consumption,  $R^2 = .39$ ,  $R^2_{adj} = .34$ ,  $F(6, 68) = 7.265$ ,  $P < .001$ .