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Objectives: In healthcare facilities, environmental reservoirs of CPE are associated with CPE outbreaks. In the newly built NCID building, we studied the introduction of CPE in the aqueous environment. **Methods:** We sampled the aqueous environments (ie, sink, sink strainer, and shower drain-trap with Copan E-swabs and sink P-trap water) of 4 NCID wards (ie, 2 multidrug-resistant organism (MDRO) wards and 2 non-MDRO wards). Two sampling cycles (cycle 1, June–July 2019 and cycle 2, September–November 2019) were conducted in all 4 wards. Cycle 3 (November 2020) was conducted in 1 non-MDRO ward to investigate CPE colonization from previous cycles. Enterobacterales were identified using MALDI-TOF MS and underwent phenotypic (mCIM and eCIM) and confirmatory PCR tests for CPE. **Results:** We collected 448, 636, and 96 samples in cycles 1, 2, and 3, respectively. MDRO and non-MDRO wards were operational for 1 and 7 months during the first sampling cycle. The CPE prevalence rates in MDRO wards were 1.67% (95% CI, 0.46% – 4.21%) in cycle 1 and 1.76% (95% CI, 0.65% – 3.80%) in cycle 2. In the aqueous environments in MDRO wards, multiple species were detected (cycle 1: 2 *K. pneumoniae*, 1 *E. coli*, and 1 *S. marcescens*; cycle 2: 5 *K. pneumoniae* and 1 *R. planticola*), and multiple genotypes were detected (cycle 1: 3 *bla*OXA48; cycle 2: 5 *bla*OXA48 and 1 *bla*KPC). The CPE prevalence in non-MDRO wards was 1.92% (95% CI, 0.53%–4.85%) in cycle 1. The prevalence rate increased by 5.51% (95% CI, 1.99%–9.03%) to 7.43% (95% CI, 4.72%–11.04%; $P = .006$) in cycle 2, and by another 2.98% (95% CI, −3.82% to 9.79%) to 10.42% (95% CI, 5.11% – 18.3%; $P = .353$) in cycle 3. Only *bla*OXA48 *S. marcescens* were detected in all cycles (except 1 *bla*OXA48 *K. pneumoniae* in cycle 2) in the non-MDRO ward. **Conclusions:** CPE established rapidly in the aqueous environment of NCID wards, more so in MDRO wards than non-MDRO wards. Longitudinal studies to understand the further expansion of the CPE colonization and its impact on patients are needed.

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Scoping review of cleaning of high-touch surfaces (HTSs) in inpatient wards

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Objectives: High-touch surface (HTS) cleaning is critical to prevent healthcare-associated infections. However, HTS definitions and cleaning frequency vary across guidelines. We conducted a scoping review of published guidelines on HTS definitions and recommended cleaning frequency in inpatient wards. **Methods:** We searched national and societal guidelines on Google and PubMed using the following search terms: [(environmental cleaning/disinfection/housekeeping/sanitization), (hospital/healthcare/infection control prevention/inpatient/acute care), and (practice/guideline/guidance/methodology/protocol)]. We compared the guidelines' HTS definitions, recommended cleaning frequency, and supporting evidence. **Results:** In total, 9 environmental cleaning guidelines were included: Centers for Disease Control and Prevention (CDC 2020); Asia Pacific Society of Infection Control (APSIC 2013); International Society for Infectious Diseases (ISID 2018); Joint Commission Resources (JCR 2018); National Health Service, United Kingdom (NHSUK 2021); Public Health Agency, Northern Ireland (PHANI 2016); Public Health Ontario, Canada (PHOC 2018); National Health and Medical Research Council, Australia (NHMRC 2019); Ministry of Health, Singapore (MOH 2013). These 6 guidelines identified 31 types of HTS: bed rails and frames [mentioned by 6 of 6 guidelines]; call bells, doorknobs and handles (5 of 6 guidelines); bedside tables and handles, light switches, overbed and tray tables, and sinks and faucet handles (4 of 6 guidelines); chairs and chair arms, edges of privacy curtains, IV infusion pumps and poles, keyboards, medical equipment, monitoring equipment, and telephones (3 of 6 guidelines); assist bars, counters, elevator buttons, toilet seats and flushes, transport equipment, and wall areas around the toilet (2 of 6 guidelines); and bedpan cleaners, beds, blankets, commodes/bedpans, dispensers, documents, mattresses, monitors, mouse, pillows, and touch screens (1 of 6 guidelines). The JCR, NHMRC, NHSUK guidelines did not define HTSs. The 6 guidelines recommended at least daily cleaning for HTSs, but ISID, JCR, and NHSUK guidelines did not mention HTS cleaning frequency. The CDC guidelines further specified at least once daily cleaning for inpatient wards and private toilets and twice daily for public or shared toilets. None of the guidelines cited any references for HTS cleaning frequency recommendations. **Conclusions:** There is no uniformity in HTS definitions among 6 guidelines, and the recommended HTS cleaning frequency in these guidelines was not supported by published evidence. Studies exploring optimal cleaning frequency of HTSs are needed.

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Assessment of compliance to cleaning of computers by healthcare workers (HCWs) using adenosine triphosphate (ATP) measurement

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Objectives: HCWs are recommended to wipe the computers with alcohol wipes before clinical use. Compliance assessment by direct observation is resource intensive. We used ATP measurement as a surrogate to assess the

compliance to preutilization cleaning of computers. **Methods:** We conducted a pilot study to determine the median relative light unit (RLU) value reflective of preutilization cleaning of the computers. We identified values of <250, 250–500, and >500 RLU to reflect cleaned, probably cleaned, and not cleaned computers, respectively. Subsequently, we conducted a cross-sectional study of the computers in the inpatient wards in Tan Tock Seng Hospital and National Centre for Infectious Diseases. Using 3M Clean-Trace ATP swabs, we tested 5 computers in each ward: 2 computers on wheels, 2 from the nursing station, and 1 at the patients' room entrance. All analyses were conducted using STATA version 15 software. **Results:** Between October 4 and 10, 2021, we collected 219 samples from 219 computers. Among them, 44 (20.1%) were cleaned, 49 (22.4%) were probably cleaned, and 126 (57.5%) computers were not cleaned. Higher compliance to computer cleaning was observed in COVID-19 wards [85 ATP samples; cleaned, 37 (43.5%); probably cleaned, 26 (30.6%); not cleaned, 22 (25.9%)] compared with non–COVID-19 wards [134 ATP samples; cleaned, 7 (5.2%); probably cleaned, 23 (17.2%); not cleaned, 104 (77.6%)] ($P < .01$). No significant difference was observed in compliance with cleaning computers between the ICU [30 ATP samples; cleaned, 7 (23.3%); probably cleaned, 4 (13.3%); not cleaned, 19 (63.3%)] and general wards [189 ATP samples; cleaned, 37 (19.6%); probably cleaned, 45 (23.8%); not cleaned, 107 (56.6%)] ($P = .47$). **Conclusions:** ATP swab tests can be used as a surrogate marker to assess compliance to pre-utilization cleaning of computers. Enhanced awareness of environmental hygiene may explain the higher compliance to computer cleaning observed in COVID-19 wards.

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Microbiological analysis concerning antimicrobial effect of atomized ionless hypochlorous acid water in a hospital environment
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Objectives: We evaluated the disinfecting efficacy of atomized ionless hypochlorous acid water (CLFine) against pathogenic microorganisms in an isolation room. **Methods:** The study was conducted in an isolation room of Kurume University Hospital. CLFine with available chlorine concentrations of 40 ppm and 300 ppm as test substances and purified water as control were atomized with an ultrasonic atomizer (CLmistL). The 40 ppm and 300 ppm of CLFine were atomized at the atmospheric available chlorine concentrations of ~0.03 ppm and 0.1~0.2 ppm, respectively, and purified water was atomized in the same manner as CLFine. Petri dishes with *Staphylococcus aureus, Bacillus cereus* spores, *Bacillus subtilis* spores and *Aspergillus ruber* were allocated in the room, then CLFine or purified water was atomized. Sampling was performed at 3 and 5 hours after the start of atomization, and the bacterial counts were measured. The study was carried out either with air conditioning turned "on" or "off" because atmospherically available chlorine concentration is affected by ventilation. **Results:** When the air conditioning was turned on, purified water showed a slight reduction of bacterial counts by 0.9 log or less at 5 hours after the atomization. When CLFine was used, 40 ppm greatly reduced the counts of *Staphylococcus aureus* by 5.1~5.4 logs reduction at 5 hours after the atomization, but no distinctive efficacy was observed against other microorganisms. On the other hand, 300 ppm caused a significant reduction of the bacterial counts for all the microorganisms at 5 hours after the atomization ($P < .001$ vs purified water). The same results were observed in the environment with the air conditioning turned off. **Conclusions:** Our data suggest that CLFine effectively disinfects pathogenic microorganisms and can contribute to maintaining the hygienic environment of hospital rooms. This study was funded as contracted research by NIPRO Corporation with the approval of the ethics committee (study no. 21229).

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Abstract Number: SG-APSIC1023
Contamination of the geriatric medicine outpatient rehabilitation gym environment and the effectiveness of our current disinfection methods with patient hand hygiene practices
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Objectives: To quantify the microorganism burden of rehabilitation gym equipment surfaces as well as to assess the effectiveness of patient's practice of hand hygiene and our current disinfection methods to reduce burden and transmission of microorganisms during rehabilitation sessions. **Methods:** A prospective study of environmental contamination using microbiology culture in Khoo Teck Puat Hospital Geriatric Medicine Outpatient Rehabilitation Gym. **Results:** For both the control and intervention group, the total aerobic bacterial count on the gym equipment after patient use is significant and increase up to 360 CFU per swab. In the control and intervention groups, the total aerobic bacterial counts on the gym equipment before patients' use were negligible (<10 CFU per swab). The total aerobic bacterial count of the equipment remained negligible (<10 CFU per swab) after patient use and immediate disinfection. We detected discrepancies between the results of the total aerobic bacterial count after patient use between the control and intervention groups. **Conclusions:** Outpatient rehabilitation gyms are potential reservoirs of microorganisms, which may further contribute to the transmission of healthcare-associated pathogens. In this study, an intervention in which cleaning equipment was wiped with alcohol wipes was effective in reducing microorganism transmission in the rehabilitation gym environment and should be considered as part of our infection control strategy. The additional step of involving our patients in using hand rub before the start of their therapy sessions can provide additional benefit in reducing microorganism transmission only if patients adhere to the World Health Organization (WHO) recommended 7 steps of proper hand rub. Good patient education on hand hygiene is equally as important as that for healthcare professionals to control environmental contamination.

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Transcriptome meta-analysis revealed concordant molecular signatures between acne skin and PM2.5-treated in vitro skin models
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Objectives: Cohort and epidemiology studies have previously revealed potential associations between air pollution exposure and acne vulgaris. However, the molecular mechanisms that drive these associations are not currently well understood. In this study, we compared the molecular signatures of acne and PM2.5-exposed skin to infer whether common underlying biological mechanisms exist. **Methods:** Acne microarray data sets were downloaded from GEO. RMAExpress was used for microarray normalization, and TMeV was used to identify differential expressed genes (DEGs). A random-effects model in MetaVolcanoR was used to determine fold changes and P values. DEGs of PM2.5-exposed skin-cell models were obtained from the literature. DEGs were compared using GeneOverlap and