

Impact of interfering substances on the bactericidal efficacy of different commercially available hypochlorous acid-based wound irrigation solutions commonly found in South-East Asia

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Objectives: Chronic wounds are commonly manifested with biofilms that result in delayed healing and recurring infection episodes. Due to increasing antimicrobial resistance, antiseptics have played a significant role in wound infection management. To date, there is no standardised method to assess the 'true' antimicrobial efficacy of different antimicrobials, especially in testing condition that stipulate a high protein environment in the wound. As clinicians often rely on the antimicrobial efficacy profiles for product selection, a rigorous testing is warranted. Hypochlorous acid (HOCl)-based solutions have been introduced as a good alternative for wound cleansing but the assessment of its antimicrobial activities in a stipulate wound environment is limited. In this study, we assessed the *in vitro* bactericidal activities of 7 commercially available wound irrigation products commonly found in South-East Asia. **Method:** The evaluation was conducted using quantitative suspension method, EN 13727 in either low or high protein conditions. **Results:** Under low protein conditions, four out of the five HOCl products achieved bactericidal activity ($\geq 5 \log_{10}$ reduction factor; RF) within 2 to 5 minutes, and only one product achieved 5 log RF at 15 seconds. None of the HOCl achieved 5 log RF under high protein, even after 30 minutes of exposure time. In contrast, protein interference on the antimicrobial activities of polyhexamethylene biguanide-based product is less pronounced (low protein: 60 seconds vs. high protein: 2 minutes to attain $\geq 5 \log$ RF). Octenidine dihydrochloride is the only active not affected by protein interference achieving $\geq 5 \log_{10}$ RF within 15 seconds in both low and high protein conditions. **Conclusion:** These findings warrant the need to screen antimicrobial wound care products, especially HOCl-based products, in high protein condition to better reflect the antimicrobial activities in wound care.

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Efficacy of octenidine- and chlorhexidine-based wash-mitts against *Candida albicans* and *Candida auris* – a comparative study

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Objectives: Management of outbreaks of the newly emerging pathogen *Candida auris* may include use of antimicrobial wash-mitts for decolonization. In the absence of large-scale clinical trials, the immediate assessment of the efficacy claims for these products can be based on *in vitro* experimental data that follows the standard protocols established by CEN (European committee for Standardization). In this study, the chemical tolerance of *C. auris* was compared with the surrogate test organism *Candida albicans* as established in the European standards (EN). **Methods:** The study was conducted following the protocol for the quantitative suspension test EN 13624 using *C. albicans* ATCC 10231 in comparison to *C. auris* DSMZ 21092 and *C. auris* DSMZ 105986. Two commercially available wash-mitts containing chlorhexidine digluconate (CHG) or octenidine dihydrochloride (OCT) were used. Experiments were conducted using the impregnation liquid squeezed from the wash-mitts at different dilution concentrations between 0.5% to 97% at a contact time of 30 sec in the presence of 0.03% bovine serum. **Results:** Yeastcidal efficacy according to EN 13624 was found for the OCT wash-mitts at 30 sec at $\geq 10\%$ concentration with *C. albicans* ($\geq 4 \log$ RF). In comparison, for both *C. auris* strains $\geq 4 \log$ RF was found at a much lower concentration of $\geq 1\%$.

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For the CHG wash-mitts efficacy against *C. albicans* was below 2 log RF at 97% concentration within 30 sec. In contrast efficacy against the two *C. auris* strains was around 3 log RF. **Conclusion:** In conclusion, both *C. auris* strains were found to be significantly more susceptible when compared to *C. albicans* in this study. Moreover, our data also demonstrates that not all antiseptic-impregnated body wipes is equally effective against *C. auris* with OCT having a higher efficacy compared to CHG.

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Harnessing the capabilities of an electronic health record system to enhance surveillance for Middle East respiratory syndrome in an acute hospital

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Objectives: The recent experience of the COVID-19 pandemic emphasized the critical need for a surveillance system to alert healthcare facilities about the admission of patients with emerging infectious diseases (EID), thereby preventing nosocomial transmissions. **Methods:** Tan Tock Seng Hospital, an 1800-bed acute tertiary-care hospital in Singapore, transitioned to a new-generation electronic medical record system, Epic, in August 2022. Leveraging the system's capabilities, we developed an algorithm to generate the line-list of suspected Middle East Respiratory Syndrome (MERS) patients, in alignment with the screening guidelines provided by Singapore's Ministry of Health. The algorithm first identifies patients who presented within 14 days (maximum incubation period) of their travel to Arabic peninsular countries. This information is documented by the emergency department's triage nurses. Additionally, patients with suspected MERS indicated in the problem list or diagnosis by attending clinicians, particularly emergency-medicine physicians or infectious-disease physicians, are included. Furthermore, patients who are ordered for a MERS- Coronavirus polymerase chain reaction test, are identified. The algorithm can also be further modified as and when the case definition of the EID changes. **Results:** The surveillance report constructed with Epic algorithm can be scheduled for daily generation or generated on demand within a few minutes. This newer approach is more time- and resource-efficient compared to the manual surveillance process, which necessitates at least three staff members to engage in a series of prolonged manual processes. The report, by extracting information directly from Epic in near real-time, also minimizes the likelihood of errors that may occur during the manual process. Subsequently, the team of epidemiologists identifies the suspected MERS patients from the generated report and efficiently follow up them until a diagnosis of MERS is excluded. **Conclusions:** Harnessing Epic's capabilities, we constructed an algorithm to efficiently and swiftly identify suspected MERS patients, enabling the timely implementation of infection prevention strategies to prevent nosocomial transmission.

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Using oral care sets to reduce ventilator-associated pneumonia in intensive care units of tertiary care hospitals in a middle-income country: a multi-center study

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Objectives: A multi-center study aimed to determine the outcome of using oral care sets for cleaning the oral cavity of the patients admitted to the Intensive Care Units (ICU). **Methods:** Oral care sets which are single-use sets consisting of two toothbrushes with toothpaste, six 0.12% chlorhexidine swabs, and an oral moisturizer swab were developed. The ICUs of fourteen tertiary care hospitals participated in the study. All ICU nurses were asked to brush the patient's teeth twice and clean the patient's oral cavity with antiseptic six times daily. One thousand four

hundred and two patients were recruited. The oral care sets were used with each patient on the first day they received mechanical ventilation until weaning. VAP surveillance was conducted to compare the VAP rate before and after the ICU used the oral care set. **Results:** Two hundred and sixty-six VAPs developed with an overall 34,731 ventilator days in the participating ICUs in 2022, before ICUs used oral care sets. The VAP rate was 7.66 per 1,000 ventilator days. The cost of antibiotic treatment was 5,134,621.74 Thai Bath. In 2023, after the ICUs used the oral care sets, 182 VAPs were developed. The overall ventilator day was 34,309. The VAP rate was reduced to 5.30 per 1,000 ventilator days. The cost of antibiotic treatment was reduced to 2,101,939.70 Thai Bath. One hundred and eighty-seven ICU nurses evaluated the benefit of the oral care set. Ninety-six-point eight percent of them agreed and strongly agreed that the single-use oral care set could prevent hospital-associated infections. Ninety-two-point five percent agreed and strongly agreed that only one nurse could clean the patient's oral cavity, the oral care set helped reduce VAP occurrence (92%), the patient's teeth and oral cavity were clean (92%), and ICU nurses could work conveniently (91.4%). **Conclusion:** The single-use oral care set can help reduce the VAP occurrence among patients admitted to the ICU.

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Using the ultra violet C radiation (UVC) led to reduce the airborne microbe in the medical center of North Taiwan

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Introduction: According to the recommendation of the United States Environmental Protection Agency, the bacteria count of airborne microbe must be under 1500 cfu/ m³. And as we know, the environment is the key factor of the airborne microbe. Traditional, we used air-conditioning to let the air circulate, but this method may be useful in other environments but is not suitable in hospitals. So, there were many new technologies to improve the quality of airborne microbe, just as UVC, plasma, and filtration. In this study, we used the UVC LED to examine the quality of airborne microbes in our meeting room of the emergency room. **Material and method:** We used the impaction method to collect the air for 10 minutes then gathered 1000L air to impact the Tryptone Soy Agar. After collection, we incubated at 37°C for 48 hours to check the bacteria count. So, we used this method to test the quality of airborne microbe before and after adding the UVC-LED (NKFG, Taiwan) to our air conditioner vent in the meeting room of the emergency room. **Result:** Before adding the UVC-LED, the average bacteria count in difference time was from 361 to 443, and after adding the UVC-LED, the average bacteria count in difference time was from 214 to 300, and the percentage of reducing count was from 24% to 40%. **Conclusion:** Due to this study, we thought the UVC-LED could improve the quality of the airborne microbe. Otherwise, this technology would not use too much space because of the limitations of the environment.

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Improving the quality of terminal cleaning & disinfection and reducing nosocomial outbreaks during COVID-19 pandemic in medical center of TAIWAN

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Introduction: Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is highly contagious in humans, and in May 2021, an outbreak occurred in the Wanhua district of Taiwan. During the Coronavirus disease 2019 (COVID-19) pandemic, we implemented various rules to prevent the spread of SARS-CoV-2- alpha in the hospital. This included establishing four special wards (dedicated care wards) specifically for patients infected with SARS-CoV-2-alpha. When patients were discharged, we conducted real-time polymerase chain reaction (RT-PCR) testing on the terminal environment to ensure that SARS-CoV-2- alpha was not present. Maintaining a negative test result was crucial for preventing cross-infection and further outbreaks. The goal of this study was to identify effective intervention measures to improve the quality of terminal cleaning and achieving overall infection control in the hospital. **Methods:** After cleaning and disinfection of the dedicated care wards by the cleaning staff as per the recommendations of the Centers for Disease Control (CDC), we collected three swabs from different areas in one ward. We used Roche and GeneXpert instruments for COVID-19 RT-PCR testing. However, because the test results were not ideal, we introduced ultraviolet-C (UV-C) machines and a disinfectant solution containing hydrogen peroxide (H₂O₂) into our current cleaning and disinfection procedures. **Results:** The negative test result ratios for RT-PCR testing were 80.13% when cleaning was done with bleach- only method as a disinfectant (without intervening with other methods); 92.81% when intervening with UV-C machine disinfection for 5 minutes was done before bleach disinfection; 96.19% when bleach was replaced with a disinfectant solution containing H₂O₂ and intervening with UV-C disinfection. **Conclusion:** The quality of terminal cleaning and disinfection was a key factor in reducing nosocomial outbreaks. We could consider using UV-C machine and H₂O₂ disinfectant to intervene in the current bleach disinfection method to enhance the quality of terminal cleaning and disinfection in the hospital.

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The effect of Meropenem stewardship at Prof Ngoerah Hospital on the prevalence of carbapenem resistant *Acinetobacter baumannii*, Carbapenem-resistant *Pseudomonas aeruginosa* and the cost of purchasing meropenem

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Background: Irrational use of antibiotics will trigger anti-microbial resistance which is a threat to health problems now and in the future. The use of meropenem is often the last choice in using antibiotics without undergoing microbiological examination (culture). The rational use of meropenem is expected to reduce resistant microbes as well as reducing hospital costs. Anti-microbial stewardship at Prof Ngoerah General Hospital began to be implemented at the end of 2020, and evaluation of the implementation of antimicrobial stewardship is required. **Objective:** The aim of this study