

Infection Prevention and Control

Current Awareness Bulletin

April 2025

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Sustainable vs. Conventional Cleaning in Healthcare: Microbiological and Life Cycle Insights

Riccardo Fontana, Luciano Vogli, Mattia Buratto, Anna Caproni, Chiara Nordi, Mariangela Pappadà, Martina Facchini, Cesare Buffone, Beatrice Bandera and Peggy Marconi

Abstract

This study investigates the environmental and microbiological effectiveness of two cleaning protocols—EVA (Ecological Visible Approach) and a traditional cleaning protocol—implemented in a healthcare setting. The cleaning procedures were conducted using specific equipment tailored to each protocol, with the EVA Protocol emphasizing sustainable practices. Microbiological evaluations assessed the effectiveness of each protocol in reducing microbial presence on various surfaces. The results demonstrated that the EVA Protocol not only met but often exceeded the microbiological standards achieved by the traditional protocol while significantly reducing the environmental footprint. The comparative Life Cycle Assessment (LCA) highlighted the EVA Protocol's ability to lower CO₂ emissions by 31.5% compared to the traditional protocol. This study underscores the potential benefits of adopting sustainable cleaning practices in healthcare settings, contributing to both environmental preservation and effective infection control.

Continue reading at <https://www.mdpi.com/2071-1050/17/3/1114>

1. Theory-driven approach to hand hygiene promotion intervention in hospitals: a case of theory of planned behaviour

Authors: Barekati, Hassan; Rakhshanderou, Sakineh; Mehrabi, Yadollah; Mazar, Leili and Ghaffari, Mohtasham

Publication Date: 2025

Journal: Health Education Research 40(2), pp. 1–12

Abstract: Nosocomial infections are among the major challenges faced by health systems worldwide, with hand hygiene being one of the simplest and most important preventive measures. This study aimed to assess the effectiveness of an educational intervention based on the Theory of Planned Behaviour (TPB) in improving hand hygiene behaviour among hospital nursing staff. A total of 194 nursing staff members were selected using a random sampling method and randomly assigned to intervention and control groups. Data were collected through researcher-made questionnaire based on the TPB and the World Health Organization's five moments of hand hygiene. The intervention programme was developed and implemented following a pretest, response analysis, and educational needs assessment. The results showed a significant change in the mean scores of subjective norms, perceived behavioural control, behavioural intention, and behaviour at baseline, immediately after, and 2 months after the intervention in the intervention group. Hand hygiene adherence at the moments of 'before touching a patient', 'after body fluid exposure', and 'after touching a patient' showed significant differences in the intervention group. Given the effectiveness of TPB-based intervention and the influence of factors like the environment and reinforcement, combining TPB with constructs from other behaviour change theories, particularly Social Cognitive Theory is recommended to improve hand hygiene compliance.

2. Strategies to enhance nurses' adherence to central line-associated bloodstream infection prevention bundles in the ICU setting: A systematic review

Authors: Bou Hamdan, Diaa;Hatahet, Sarah;Khalil, Heba and Yousef, Khalil M.

Publication Date: 2025

Journal: Heart & Lung 71, pp. 98–105

Abstract: • Education, leadership, audit, and feedback can improve adherence with central line-associated bloodstream infections (CLABSI) bundles. • Education is the most commonly used strategy. However, combining education with leadership support and audit feedback may create a synergistic effect. • CLABSI bundles can only prevent bloodstream infection when adhered to. To better design strategies to optimize adherence to CLABSI bundles, randomized controlled trials are needed to establish the effectiveness of these strategies. The incidence of central line-associated bloodstream infection (CLABSI) in the ICU continues to rise. Despite existing CLABSI bundles to prevent infections, adherence remains suboptimal. To identify and synthesize the evidence about strategies used to enhance nurses' adherence to CLABSI prevention bundles. Five databases were searched: CINAHL, MEDLINE, PubMed, Cochrane Library, and SCOPUS. Eligible studies were those published between 2012–2024, and investigated the adherence to central line bundles and strategies to improve adherence in the ICU. Two reviewers independently screened, critically appraised, and extracted data using Joanna Briggs Institute tools. The review protocol was registered on PROSPERO (CRD42024513345). Seven studies met the inclusion criteria, including four quality improvement projects and three quasi-experimental studies. The studies ranged in quality from moderate to high, with scores between 68.75 %-88.88 %. These studies explored various

strategies to enhance nurses' adherence to CLABSI prevention bundles. Strategies included education, leadership, and auditing/feedback mechanisms. Education was the primary strategy utilized and included simulation and online training. Active participation in decision making, transparency in sharing CLABSI outcome data, celebrating achievements, and electronic documentation were essential aspects of leadership support to promote adherence. Implementing these strategies led to significant improvements in nurses' adherence to bundle (<0.01). Education, leadership, and audit mechanisms improve adherence to CLABSI bundles. Yet, the current evidence lacks randomized controlled trials that can establish effectiveness of these strategies. Future research should also investigate the long-term effect of these strategies on adherence, and the influence of organizational culture on CLABSI bundle adherence.

3. Spreading of hand hygiene change package across an acute hospital

Authors: Chew, Alvin; Tan, Seow Yen; Chandran, Rajkumar; Tang, Mui Mui; Poulouse, Vijo; Punithavathi, A.; Ang, Woo Boon and Tee, Augustine

Publication Date: 2025

Journal: BMJ Open Quality 14(2)

Abstract: Competing Interests: Competing interests: None declared.; Background: A set of interventions in a hand hygiene change package was developed in a pilot ward by the end of 2017. In 2018, Changi General Hospital embarked on scaling up the change package to other wards with the intention to eventually spread the hand hygiene change package hospital-wide.; Methods: Changi General Hospital conducted a quality improvement project on hand hygiene with the intention to effect organisation-wide improvement in hand hygiene. Spread methodologies such as the Institute for Healthcare Improvement's framework for Spread and various complementary spread concepts such as having an organisational strategy, which plans for spread as early as possible, and addressing social aspects of change were applied in order to scale up and spread a change package.; Setting: A general tertiary care hospital in Singapore.; Results: Overall hospital-wide hand hygiene compliance improved from a median of 66% during the pilot phase to 73% in the scale-up phase ($p<0.05$) to 82% during the spread phase ($p<0.05$).; Conclusions: A systematic approach to hand hygiene improvement based on spread literature successfully improved and sustained hospital-wide hand hygiene compliance. Success factors included the development of a change package that had clear guiding principles, with the intent to create proactive learning cycles within units which could be adapted to work in various contexts. (© Author(s) (or their employer(s)) 2025. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ Group.)

4. Infection prevention and control for measles in healthcare settings

Authors: Frantzis, Irene; Acker, Karen P.; Benjamin, E. O.; Pato, Rookmin; Legall, Stephanie; Singh, Harjot K. and Saiman, Lisa

Publication Date: 2025

Journal: Infection Control and Hospital Epidemiology , pp. 1–8

Abstract: Healthcare facilities in the U.S. are well positioned to assist with measles control by timely identification and isolation of suspected or confirmed cases and, as measles is nationally notifiable, by informing local health departments about both suspected and confirmed cases. However, responding to measles cases in acute healthcare settings presents unique challenges, is disruptive, and requires an intense outlay of resources before, during, and afterward primarily due to exposure investigations. We describe our measles preparedness efforts to improve identification of measles cases, facilitate appropriate isolation, reduce exposures, and provide timely post-exposure prophylaxis.

5. Compliance of infection control practices among registered nurses: A cross-sectional study

Authors: Harb, Suzan;Abu Shosha, Ghada;Oweidat, Islam Ali;Al-Mugheed, Khalid;Alzoubi, Majdi M. and Abdelaliem, Sally Mohammed Farghaly

Publication Date: 2025

Journal: Medicine 104(14), pp. e42062

Abstract: Competing Interests: The authors have no conflicts of interest to disclose.; Nurses are essential in the upkeep, maintenance, and implementation of infection control standards and guidelines by ensuring that their practices reflect the current evidence in the prevention of infectious diseases. The study performed to measure the level of infection control practices compliance among nurses. A cross-sectional design, was performed among nurses in 3 governmental hospitals. Infection control practices Tool were shared between August 2023 and October 2023, made up of 29 questions scored using a 5-point Likert scale. Overall mean levels of infection control practices were rated weak compliance (raw score = 105, mean = 3.64, standard deviation SD] = 0.9). The items with the highest rated scores were Item 1 ("I wash my hands before and after giving care to patient") (raw score = 110, mean = 3.79, SD = 1.0) and Item 25 ("I inform other units before transferring patients who are under contact precautions") (raw score = 110, mean = 3.79, SD = 1.1). None of the sociodemographic variables analyzed show a statistically significant relationship with infection control practices, as all P-values are >.05. Nurse, managers, and hospital administrators should ensure that policies reflect the critical significance of infection control practices in preventing further morbidity and mortality among hospitalized patients and protecting the health and well-being of nurses and other healthcare staff. (Copyright © 2025 the Author(s). Published by Wolters Kluwer Health, Inc.)

6. Sensor-Based Monitoring of Hand Hygiene in Hospitals: Strengths and Weaknesses of an IoT-Based System

Authors: Hostettler, Silvan;Engel, Dana and Sariyar, Murat

Publication Date: 2025

Journal: Studies in Health Technology and Informatics 323, pp. 312–316

Abstract: Hand hygiene is a critical aspect of patient safety in hospitals. To assess adherence to hand hygiene protocols, a sensor-based system has been developed that monitors the movements of healthcare professionals using Bluetooth technology. This system comprises a Data Collection Node (DCN) and several Bluetooth beacons strategically installed within the monitored department. Results from a study conducted at the Eastern Switzerland Children's Hospital indicate that while the system is capable of generating movement profiles, it fails to provide reliable adherence profiles for hand hygiene. It is essential to develop more precise technologies, which may be more costly than the Bluetooth beacon technology currently employed. Nevertheless, this project highlights potential avenues for enhancing hospital hygiene practices through digital monitoring and support.

7. Moral distress among infection prevention and control professionals: A scoping review

Authors: Mason, Matt;Im, Byeonghun;Basseal, Jocelyne M. and Zimmerman, Peta-Anne

Publication Date: 2025

Journal: Infection, Disease & Health 30(2), pp. 152–161

8. Infection prevention and control professionals: Stress, resilience, personality traits and views about their workforce and profession

Authors: Mitchell, Brett G. and Russo, Philip L.

Publication Date: 2025

Journal: Infection, Disease & Health 30(2), pp. 97–104

9. Healthcare-Associated Infections: The Role of Microbial and Environmental Factors in Infection Control-A Narrative Review

Authors: Sandu, Andreea M.;Chifiriuc, Mariana C.;Vrancianu, Corneliu O.;Cristian, Roxana-E.;Alistar, Cristina F.;Constantin, Marian;Paun, Mihaela;Alistar, Alexandru;Popa, Loredana G.;Popa, Mircea I.;Tantu, Ana C.;Sidoroff, Manuela E.;Mihai, Mara M.;Marcu, Andreea;Popescu, George and Tantu, Monica M.

Publication Date: 2025

Journal: Infectious Diseases and Therapy

Abstract: Competing Interests: Declarations. Conflict of Interest: Andreea Mihaela Sandu, Mariana Carmen Chifiriuc, Corneliu Ovidiu Vrancianu, Roxana-Elena Cristian, Cristina Florentina Alistar, Marian Constantin, Mihaela Paun, Alexandru Alistar, Loredana Gabriela Popa, Mircea Ioan Popa, Ana Catalina Tantu, Manuela Elisabeta Sidoroff, Mara Madalina Mihai, Andreea Marcu, George Popescu, and Monica Marilena Tantu declare that they have no competing interests. Ethical Approval: This article is based on previously conducted studies

and does not contain any new studies with human participants or animals performed by any of the authors.; Healthcare-associated infections (HAIs), previously known as nosocomial infections, represent a significant threat to healthcare systems worldwide, prolonging patient hospital stays and the duration of antimicrobial therapy. One of the most serious consequences of HAIs is the increase in the rate of antibiotic resistance (AR) generated by the prolonged, frequent, and sometimes incorrect use of antibiotics, which leads to the selection of resistant bacteria, making treatment difficult and expensive, with direct consequences for the safety of patients and healthcare personnel. Therefore, timely and accurate diagnosis of HAIs is mandatory to develop appropriate infection prevention and control practices (IPC) and new therapeutic strategies. This review aimed to present the prevalence, risk factors, current diagnosis, including artificial intelligence (AI) and machine learning approaches, future perspectives in combating HAIs causative bacteria (phage therapy, microbiome-based interventions, and vaccination), and HAIs surveillance strategies. Also, we discussed the latest findings regarding the relationships of AR with climate change and environmental pollution in the context of the One Health approach. Phage therapy is an emerging option that can offer an alternative to ineffective antibiotic treatments for antibiotic-resistant bacteria causing HAIs. Clinical trials dealing with vaccine development for resistant bacteria have yielded conflicting results. Two promising strategies, fecal microbiota transplantation and probiotic therapy, proved highly effective against recurrent *Clostridium difficile* infections and have been shown to reduce HAI incidence in hospitalized patients undergoing antibiotic therapy. Artificial intelligence and machine learning systems offer promising predictive capabilities in processing large volumes of clinical, microbiological, and patient data but require robust data integration. Our paper argues that HAIs are still a global challenge, requiring stringent IPC policies, computer vision, and AI-powered tools. Despite promising avenues like integrated One Health approaches, optimized phage therapy, microbiome-based interventions, and targeted vaccine development, several knowledge gaps in clinical efficacy, standardization, and pathogen complexity remain to be answered. (© 2025. The Author(s).)

10. Infection prevention and control of epidemic-prone acute respiratory infections in healthcare setting

Authors: Simniceanu, Alice and Satta, Giovanni

Publication Date: 2025

Journal: Current Opinion in Pulmonary Medicine 31(3), pp. 230–236

Abstract: Purpose of Review: The recent COVID-19 pandemic sparked discussions and highlighted significant gaps on the most appropriate infection prevention and control (IPC) measures when dealing with acute respiratory infections (ARIs). This narrative review aims to provide an overview of the existing international and national guidelines on the IPC measures to control epidemic and pandemic-prone ARIs in healthcare settings.; Recent Findings: The WHO has recently produced a report proposing an updated terminology for respiratory pathogens. One of the key outcomes of this consultation was the adoption of the term 'infectious respiratory particles' (IRPs). According to the report, IRPs are defined as infectious particles that can be expired from an infected person through activities like breathing, talking, singing, coughing, sneezing, or even spitting. Most notably, there is no longer the clear and traditional distinction between droplet and aerosol based on the cut-off of particle size, but

rather a continuum of particle sizes of IRPs.; Summary: Among other recommendations, all international guidelines place emphasis on the use of standard and transmission-based precautions when dealing with respiratory viruses. It is important to assess how the new proposed terminology for respiratory pathogens may affect the current existing IPC measures. (Copyright © 2025 Wolters Kluwer Health, Inc. All rights reserved.)

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