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Infection Prevention and Control

Current Awareness Bulletin

June 2025

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  Next sessions: 7th July @ 4pm, 12th August @ 9am & 10th September @ 10am

Book a session today at https://forms.office.com/e/HyiSXfDaYV (these sessions will be held on a monthly basis)

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1. **Attitudes and Perceptions Toward Hand Hygiene Among Nursing Students and Nurses: A Cross-Sectional Comparative Survey**

Authors: Blomgren, Per-Ola;Hultin, Lisa;Westerbergh, Johan and Hjelm, Katarina

Publication Date: 2025

Journal: Journal of Advanced Nursing

Abstract: Aim: To describe and compare attitudes toward hand hygiene and the perceived effectiveness of prevention methods among nursing students and registered nurses at a university and its affiliated university hospital.; Design: A descriptive cross-sectional comparative survey.; Methods: A total of 201 first- and final-semester nursing students and registered nurses completed the World Health Organisation's 'Perceptions Survey for Health-Care Workers'. The survey examined perceptions on hand hygiene, patient safety and the usefulness of improvement measures. Responses were analysed using descriptive statistics.; Results: Nursing students consistently rated the importance of hand hygiene and related interventions higher than registered nurses. Students particularly emphasised the availability of hand disinfectants, ongoing education and supportive leadership. Both groups acknowledged the role of management support, regular feedback and organisational policies in reinforcing optimal hand hygiene.; Conclusion: Differences in attitudes between nursing students and registered nurses underscore the need for ongoing education, strong managerial involvement and supportive policies to sustain adherence. Strengthening these factors can help maintain positive perceptions formed during training and enhance patient safety in clinical practice.; Implications for the Profession And/or Patient Care: Educational curricula and workplace strategies that prioritise hand hygiene may help lower healthcare-associated infections.

Management-led feedback, continuous training and accessible hand hygiene resources offer additional support for safe patient care.; Impact: What problem did the study address? Low adherence to hand hygiene is a key driver of preventable infections. What were the main findings? Nursing students rated hand hygiene and improvement measures more highly than registered nurses, highlighting a need for strategies that sustain positive attitudes during the transition from education to clinical practice. Who will benefit? Nurse educators, clinical leaders and healthcare workers can use these findings to improve infection prevention across educational and practice settings.; Reporting Method: We adhered to STROBE guidelines for cross-sectional research.; Patient or Public Contribution: No patients or members of the public were involved in designing or conducting this study, which focused on perceptions of nursing students and registered nurses. (© 2025 The Author(s). Journal of Advanced Nursing published by John Wiley & Sons Ltd.)

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2. **Real-time FT-IR typing of Klebsiella pneumoniae: a flexible and rapid approach for outbreak detection and infection control**

Authors: Gonçalves, Ana Beatriz;Alves, Valquíria;Neves, Isabel;Read, Antónia;Pinheiro, Natália;Henius, Anna E.;Hasman, Henrik;Peixe, Luísa and Novais, Ângela

Publication Date: 2025

Journal: The Journal of Antimicrobial Chemotherapy

Abstract: Background: Expansion of carbapenemase-producing Klebsiella pneumoniae (CP-Kp) is driven by within-hospital transmission, requiring timely typing data for effective infection control.; Objectives: We evaluated real-time performance and flexibility of our previously developed Fourier-transform infrared (FT-IR) spectroscopy workflow (spectra acquisition and analysis by machine-learning model).; Methods: All CP-Kp infection isolates (n=136) identified at a northern Portuguese hospital (April 2022-March 2023) were tested from Columbia agar with 5% sheep blood, identified by FT-IR (KL-type/sublineage) and confirmed by reference methods (wzi sequencing, MLST and/or WGS).; Results: FT-IR typing from Columbia agar with 5% sheep blood showed 73% sensitivity, 79% specificity and 74% accuracy. Our method correctly identified 94% of typeable isolates, 87% of which were communicated in <24 h. Non-typeable isolates belonged to new KL-types to the model (40%) or non-recognized KL-types (60%), most of which (66%) were correctly predicted when retested from Mueller-Hinton agar. Accuracy was then higher (88%) when results from both culture media were considered, and the model retrained to incorporate new sublineages. Three K. pneumoniae sublineages (ST147-KL64, ST15-KL19, ST268-KL20) were predominant and 86% of the isolates were correctly identified. During the study, an outbreak by ST268-KL20 in the neonatal ICU was quickly recognized, and solved in 23 days. Most isolates (98%) produced KPC-3.; Conclusions: We demonstrate that FT-IR spectroscopy meets high performance standards in real-time and adaptability to clonal dynamics, and we provide practical guidance for integrating FT-IR into daily microbiology practices. The unique time to response (same day as bacterial identification) enables early and effective infection control interventions.

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3. **Patient Hand Hygiene Before Meals: A Systematic Review**

Authors: Kamen, Ariel;Clark, Rebecca;Bass, Michelle B.;Fonshell, Claudette;Holland, Sara;O'Donnell, Judith;Mull, Nikhil K. and Mitchell, Matthew D.

Publication Date: Jul ,2025

Journal: Journal of Nursing Care Quality 40(3), pp. 217–224

Abstract: Background: Hand hygiene is recognized as an effective way to prevent health care-associated infections (HAIs). However, there is limited attention to patient hand hygiene (PHH). Purpose: The purpose of this systematic review was to summarize evidence, interventions, and outcomes of PHH before meals. Methods: Literature was searched from 1999 to 2024 in 4 databases. The Grading of Recommendations, Assessment, Development, and Evaluation was used to appraise the strength of evidence. Results: Ten reports were included in the review. Five categories of PHH interventions were identified: direct observation, reminders, education, policy change, and bundles of more than one intervention. There is insufficient evidence to establish a direct causal link between PHH before meals and a reduction in HAIs. Conclusions: The limited and moderate level of evidence highlights a significant gap in understanding PHH. Hand hygiene is a fundamental infection prevention strategy that warrants additional research in hospitalized patient populations to determine the clinical efficacy and causal effects on HAIs.

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4. **The Mediating Effects of COVID-19 Infection Control Fatigue on Quiet Quitting: Focusing on Organisational Justice, Role Ambiguity and Job Satisfaction**

Authors: Kang, Jaejin;Jeong, Wonseok and Kim, Seungju

Publication Date: 2025

Journal: Journal of Advanced Nursing (John Wiley & Sons, Inc.) 81(7), pp. 3952–3961

Abstract: Aim: This study explored the mediating effects of organisational justice, role ambiguity and job satisfaction on the relationship between infection control-associated fatigue and quiet quitting. Design: This study used an exploratory cross-sectional survey design. Methods: Between 1 February and 29 February 2024, data were collected from 323 nurses—who worked in general or tertiary hospitals during the pandemic—using an online self-report questionnaire distributed via a popular nursing community platform. Path analysis was used to evaluate the mediating effect of infection control fatigue on quiet quitting. Results: Correlation analysis showed a negative relationship between quiet quitting and organisational justice and positive relationships with job satisfaction, role ambiguity and infection control fatigue. Infection control-associated fatigue was associated with quiet quitting (B = 0.1117, p < 0.05). Job satisfaction (IE = 0.1397, 95% confidence intervalCI]: 0.0795–0.2031) and organisational justice (IE = −0.0455, 95% CI: −0.0938 to −0.0051) mediated the relationship between infection control-associated fatigue and quiet quitting, whereas role ambiguity did not. The total

indirect effect of mediators on quiet quitting was positive (IEtotal = 0.0978, 95% confidence interval: 0.0357–0.1623). Conclusion: Quiet quitting increased among nurses experiencing infection control fatigue during the coronavirus disease 2019 pandemic, with job satisfaction and organisational justice acting as mediators. Implications for the Profession and/or Patient Care: Increasing job satisfaction and achieving organisational justice may help improve the quality of nursing and mitigate quiet quitting. Hospitals must find ways to improve nurses' work and increase their satisfaction. No Patient or Public Contribution.

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5. **Systematic Review of Surgical Site Infection Prevention Guideline Recommendations for Maintenance of Homeostasis in the Perioperative Period**

Authors: Le Couteur, Joel;Druce, Paige;Myles, Paul S. and Peel, Trisha

Publication Date: 2025

Journal: Anesthesiology 142(6), pp. 1150–1165

Abstract: Surgical site infections are common, result in increased patient morbidity and mortality, and increase the economic burden to society. Anesthesiologists play a key role in perioperative infection prevention, with data suggesting that evidence-based measures can significantly reduce the incidence of these infections. This systematic review aimed to identify and compare current recommendations for the maintenance of homeostasis in surgical site infection prevention guidelines. Eight surgical site infection prevention guidelines published in the past 10 yr were identified. There was broad consensus regarding the importance of optimizing intraoperative homeostasis to reduce infections. However, there was substantial heterogeneity in both the studies cited and the specific recommendations provided regarding maintenance of oxygenation, normovolemia, normothermia and glycemic targets. High-quality randomized controlled trials are required to close existing knowledge gaps, with adaptive platform trials likely to play a key role in improving the current evidence base for preventing surgical site infection.

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6. **Scenario-based simulation training as a strategy to improve infection prevention and control adherence: A quasi-experimental study**

Authors: Lee, Soon-Hee and Yang, In-Suk

Publication Date: 2025

Journal: Applied Nursing Research 83, pp. N.PAG

Abstract: Healthcare-associated infections remain a critical global health concern, adversely affecting patient outcomes and increasing healthcare costs. Effective infection prevention and control measures are essential to mitigating healthcare-associated infections, yet traditional educational methods often fail to ensure their practical application. This study evaluates the effectiveness of scenario-based simulation training in improving infection control knowledge, self-efficacy, and adherence to standard precautions among clinical nurses. A quasi-experimental pre-test/post-test design with a nonequivalent control group was employed.

Sixty-eight clinical nurses were randomly assigned to an experimental or control group. The intervention included four scenario-based simulation sessions on standard and transmission-based precautions. Outcomes were assessed at baseline and two months post-intervention using validated instruments. Data were analyzed using paired t -tests and independent t-tests. Nurses in the experimental group demonstrated significant improvements in infection control knowledge (t = 7.111, p <.001, Cohen's d = 1.725, 95 % CI 1.086, 2.348]), self-efficacy (t = 2.194, p =.032, Cohen's d = 0.532, 95 % CI 0.036, 1.021]), and adherence to standard precautions (t = 4.191, p <.001, Cohen's d = 1.017, 95 % CI 0.476, 1.545]) compared to the control group. These findings underscore the efficacy of simulation training in enhancing infection prevention and control competencies among clinical nurses. Scenario-based simulation training is a valuable educational strategy for improving infection prevention and control practices among clinical nurses. Integrating this approach into infection prevention and control training programs can strengthen infection prevention efforts, enhance healthcare worker preparedness, and improve patient safety. • Simulation boosts infection control knowledge, self-efficacy, and adherence. • Hands-on training ensures long-term retention of infection control skills. • Integrating simulation enhances infection control and patient safety. • Experiential learning improves compliance with infection prevention measures.

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7. **More than rewards: insights into a hospital infection prevention and control gamification strategy**

Authors: Reinoso Schiller, N.;Motaharina, G.;König, A.;Benze, G.;Eichkorn, J.;Weber-Krüger, M.;Köster, A. M.;Fischer, L.;Schulte, E.;Ellenrieder, V. and Scheithauer, S.

Publication Date: 2025

Journal: The Journal of Hospital Infection 160, pp. 74–80

Abstract: Competing Interests: Conflict of interest statement None declared.; Background: Traditional infection prevention and control (IPC) education and training of healthcare workers (HCWs) is expensive and rarely sustainable. Gamification strategies support behavioural change by capitalizing on psychological drivers such as intrinsic and extrinsic motivation. However, little is known about which type of reward presentation best supports the engagement of HCWs.; Aim: To examine which reward strategy can best facilitate engagement and acquisition of IPC knowledge.; Methods: This study was performed in three gastroenterology wards, and a palliative care ward served as the control. Data on bed occupancy and consumption of alcohol-based hand sanitizer (ABHS) were collected over a 2-month baseline period, and the number of correct answers was gathered during the intervention phases. Surveys on expectation and satisfaction were conducted pre and post intervention. Twice-weekly knowledge quizzes used loss aversion, standard reward and in-game reward strategies. Multi-variate analysis was used to analyse data on ABHS consumption and IPC knowledge.; Findings: In total, 105 HCWs participated in this study. A 170% increase in mean ABHS consumption was observed between baseline and the last phase of gamification. This represents a significant effect of gamification (P0.05). Furthermore, gamified strategies showed higher engagement than the control strategy, but strategies of loss aversion and standard rewards did not display higher ABHS consumption or game engagement compared with gamification alone.; Conclusion: The intervention effectively engaged medical and non-medical staff in IPC topics, positively influencing HCW work flow

and increasing ABHS consumption. These findings highlight gamification as a promising approach for IPC education.

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8. **Synergistic and off-target effects of bacteriocins in a simplified human intestinal microbiome: implications for Clostridioides difficile infection control**

Authors: Ríos Colombo, Natalia,S.;Paul Ross, R. and Hill, Colin

Publication Date: 2025

Journal: Gut Microbes 17(1), pp. 2451081

Abstract: Clostridioides difficile is a major cause of nosocomial diarrhea. As current antibiotic treatment failures and recurrence of infections are highly frequent, alternative strategies are needed for the treatment of this disease. This study explores the use of bacteriocins, specifically lacticin 3147 and pediocin PA-1, which have reported inhibitory activity against C. difficile . We engineered Lactococcus lactis strains to produce these bacteriocins individually or in combination, aiming to enhance their activity against C. difficile . Our results show that lacticin 3147 and pediocin PA-1 display synergy, resulting in higher anti- C. difficile activity. We then evaluated the effects of these L. lactis strains in a Simplified Human Intestinal Microbiome (SIHUMI-C) model, a bacterial consortium of eight diverse human gut species that includes C. difficile . After introducing the bacteriocin-producing L. lactis strains into SIHUMI-C, samples were collected over 24 hours, and the genome copies of each species were assessed using qPCR. Contrary to expectations, the combined bacteriocins increased C. difficile levels in the consortium despite showing synergy against C. difficile in agar-based screening. This can be rationally explained by antagonistic inter-species interactions within SIHUMI-C, providing new insights into how broad-spectrum antimicrobials might fail to control targeted species in complex gut microbial communities. These findings highlight the need to mitigate off-target effects in complex gut microbiomes when developing bacteriocin-based therapies with potential clinical implications for infectious disease treatment.

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9. **A "Wise" Intervention to Increase Hand Hygiene Compliance of Nurses in Acute Care Units in US Hospitals: A Multiple Baseline Interrupted Time-Series Evaluation**

Authors: Sands, Madeline;Tidwell, Ben and Aunger, Robert

Publication Date: 2025

Journal: Evaluation Review 49(3), pp. 487–510

Abstract: Competing Interests: Declaration of Conflicting InterestsThe author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.; This study tested a 'wise' intervention (quick prompt of a specific psychological mec) in acute care hospital units to improve nurses' hand hygiene compliance (HHC). A multiple baseline design in two medical-surgical teaching hospitals in the United States. Hand hygiene data was collected using an electronic compliance monitoring system with sensors placed in doorways and on corresponding soap and alcohol-based hand rub dispensers. The outcome

measure was the proportion of opportunities in which HH was undertaken by staff per week in each unit. A quick-and-easy psychological prime to reinvigorate professional identity. Interrupted time series analysis using a quasi-Poisson regression model with statistical process control charts for each unit. A statistically significant increase in HHC rates that was sustained for months post-intervention. However, the patterns by unit were not statistically significant once temporal trends were considered. Other factors, such as the unit type and the use of incentives could have impacted the results. These analyses suggest that the aggregate impact should not be taken as evidence of intervention effectiveness. This study therefore cannot be considered to have provided a strong foundation for use of a 'wise' intervention, despite its relatively small financial, logistical and psychological cost.

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10. **Guiding Clostridioides difficile Infection Prevention Efforts in a Hospital Setting With AI**

Authors: Tang, Shengpu;Shepard, Stephanie;Clark, Rebekah;Ötleş, Erkin;Udegbunam, Chidimma;Tran, Josh;Seiler, Melinda;Ortwine, Justin;Waljee, Akbar K.;Nagel, Jerod;Krein, Sarah L.;Kurlander, Jacob E.;Grant, Paul J.;Baang, Jihoon;Wasylyshyn, Anastasia;Rao, Krishna and Wiens, Jenna

Publication Date: 2025

Journal: JAMA Network Open 8(6), pp. e2515213

Abstract: Key Points: Question: Can artificial intelligence (AI) tools effectively guide infection prevention efforts in hospitals? Findings: In this quality improvement study with 39 046 participants in the pre-AI period and 40 515 participants in the post-AI period, implementation of an AI-guided infection prevention bundle was not associated with a significant reduction in Clostridioides difficile infection (CDI) incidence (the primary outcome) but was associated with substantial reductions in CDI-associated antimicrobial use. Meaning: AI tools may support CDI prevention and antimicrobial stewardship in hospitals, but success depends on thoughtful and effective integration into clinical workflows. This quality improvement study examines a 28-month quality improvement program that used an institution-specific AI model to guide Clostridioides difficile infection prevention efforts at a large academic medical center. Importance: Increasingly, artificial intelligence (AI) is being used to develop models that can identify patients at high risk for adverse outcomes. However, the clinical impact of these models remains largely unrealized. Objective: To evaluate the association of an AI-guided infection prevention bundle with Clostridioides difficile infection (CDI) incidence in a hospital setting. Design, Setting, and Participants: This prospective, single-center quality improvement study evaluated adult inpatient hospitalizations before (September 1, 2021, to August 31, 2022) and after (January 1, 2023, to December 31, 2023) AI implementation. Data analysis was performed from January to August 2024. Intervention: A previously validated institution-specific AI model for CDI risk prediction was integrated into clinical workflows at the study site. The model was used to guide infection prevention practices for reducing pathogen exposure through enhanced hand hygiene and reducing host susceptibility through antimicrobial stewardship. Main Outcomes and Measures: The primary outcome was CDI incidence rate. Secondary outcomes included antimicrobial use and qualitative assessments of bundle implementation. Results: Pre-AI and post-AI samples included 39 046 (21 645 55.4%] female; median IQR] age, 58 36-70] years) and 40 515 (22 575 55.7%] female; median IQR] age, 58

37-70] years) hospitalizations, respectively. After adjusting for differences in clinical characteristics, there was no significant reduction in CDI incidence (pre-AI period: 5.76 per 10 000 patient-days vs post-AI period: 5.65 per 10 000 patient-days; absolute difference, −0.11; 95% CI, −1.43 to 1.18; P =.85). Relative reductions greater than 10% in normalized antimicrobial days were seen for piperacillin-tazobactam (−9.64; 95% CI, −12.93 to −6.28; P <.001) and clindamycin (−1.04; 95% CI, −1.60 to −0.47; P =.03), especially for high-risk patients alerted by AI (relative reduction for piperacillin-tazobactam, 16.8%; 95% CI, 8.0%-24.6%). On the basis of qualitative assessments via semistructured interviews and field observations, the study found that health care staff's experiences with AI-guided workflows varied. In particular, the enhanced hand hygiene protocols were met with poor adherence, whereas pharmacists consistently engaged with the alerts. Conclusions and Relevance: In this quality improvement study, the implementation of an AI-guided infection prevention bundle was not associated with a significant reduction in the already low CDI incidence rate at the study site, but it was associated with reduced CDI-associated antimicrobial use. The results highlight the potential of AI in supporting antimicrobial stewardship. Barriers to implementation, including infrastructure, staff knowledge, and workflow integration, need to be addressed in future applications.

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11. **Infection prevention knowledge related to central line infections and ventilator-associated pneumonias: A survey of Finnish intensive care units**

Authors: Terho, Kirsi;Löyttyniemi, Eliisa;Rintala, Esa and Salanterä, Sanna

Publication Date: 2025

Journal: American Journal of Infection Control 53(6), pp. 690–695

Abstract: Background: Health care-associated infections pose a significant risk for the patients in intensive care due to the use of medical instrumentation required for care.; Methods: We conducted a cross-sectional, nationwide survey on awareness of recommended infection prevention practices involving central venous catheters and invasive ventilators in intensive care units.; Results: A total of 810 (50% of those surveyed) nurses and physicians participated in the survey. We found that 8% of the respondents had good knowledge of infection prevention in central venous care, while 24% had good knowledge of ventilator-associated pneumonia prevention practices.; Discussion: The overall level of knowledge measured with this nationwide survey was suboptimal. The level varied between units, and depending on individual questions for particular professions. The displayed knowledge may have partially been based on tradition rather than on up-to-date evidence-based guidelines.; Conclusions: Educational training in evidence-based infection prevention is needed for practical implementation to be improved.

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12. **Digital-based emergency prevention and control system: enhancing infection control in psychiatric hospitals**

Authors: Yang, Mi;Zhu, Xiaojun;Yan, Fei;Huang, Xincheng;Wu, Zhixue;Jiang, Xin;Huang, Yan and Li, Zezhi

Publication Date: 2025

Journal: BMC Medical Informatics & Decision Making 25(1), pp. 1–11

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