Evidence summary tables: NIPCM literature identified April to June 2019

Titles and abstracts are reviewed for subject relevance. Additional exclusion criteria are also applied as per the NIPCM methodology.

Standard Infection Control Precautions:

Literature review	Papers identified	Summary of scientific findings	Impact on recommendations
Hand Hygiene: Skin Care	Wet work exposure and hand eczema among healthcare workers: a cross-sectional study. Hamnerius N, Svedman C, Bergendorff O, Bjork J, Bruze M and Ponten A. *The British Journal of Dermatology* 1778(2): 452-461, 2018.	This cross-sectional study investigated wet work exposure and skin condition in healthcare workers (HCWs). An electronic questionnaire was distributed to 28,762 hospital employees in southern Sweden to describe their exposure to hand hygiene procedures and to investigate associations between occupational hand washing, use of non-sterile gloves and hand disinfectant with self-reported hand eczema. Adjustments were made for sex, age, wet work at home, lifestyle factors and atopic dermatitis. Of the 12,288 (43%) that responded, 9051 were HCWs. One year prevalence of self-reported hand eczema was 21%. After adjustment for confounding factors, a dose-dependent association with self-reported hand eczema was found for the daily number of hand washes with soap at work and time working with disposable gloves but not for alcoholic disinfectant use. The study supports the use of alcohol-based hand rub (ABHR) for hand hygiene.	None. Adds to evidence base.
Hand Hygiene: Hand Washing	Deposition of Bacteria and Bacterial Spores by Bathroom Hot-Air Hand Dryers. Huesca-Espitia LDC, Aslanzadeh J, Feinn R, Joseph G, Murray TS and Setlow P. *Applied & Environmental Microbiology* 84(8): e00044-18, 2018.	This study investigated the environmental contamination caused by hot-air hand dryers. Hot-air hand dryers in multiple men's and women's bathrooms in three scientific research areas in an academic health centre were assessed using agar plates for the deposition of total bacteria. Plates exposed to hand dryer air for 30 s averaged 18 to 60 colonies/plate; but interior hand dryer nozzle surfaces had minimal bacterial levels, plates exposed to bathroom air for 2 min with hand dryers off averaged ≤1 colony, and plates exposed to bathroom air moved by a small fan for 20 min had averages of 15 and 12 colonies/plate in two buildings tested. The authors conclude that many kinds of bacteria, including potential pathogens and spores, can be deposited on hands exposed to	None. Adds to evidence base.

		bathroom hand dryers and that spores could be dispersed throughout buildings and deposited on hands by hand dryers.	
	The method used to dry washed hands affects the number and type of transient and residential bacteria remaining on the skin. Mutters R and Warnes SL. *Journal of Hospital Infection* 101(4): 408-413, 2019.	This study compared the efficacy of drying washed hands with a jet air dryer (Dyson Airblade) or paper towels to remove transient bacterial contamination and determined the effect on resident flora. The entire surfaces of 80 volunteers' hands were artificially contaminated with *Escherichia coli* before being washed and dried; remaining bacteria on the skin were recovered. Significantly fewer transient and resident bacteria remained on the skin if hands were dried with a jet air dryer ($P<0.001$). Drying hands with paper towels increased the number of resident bacteria released from the skin, compared to a jet air dryer. The study was funded by Dyson Technology Ltd, Malmesbury, UK; the authors stated that the company was not involved in the design, execution, and analysis of the results.	None.
Hand Hygiene: Surgical Hand Antisepsis in the Clinical Setting	Antiseptic efficacies of waterless hand rub, chlorhexidine scrub, and povidone-iodine scrub in surgical settings: a meta-analysis of randomized controlled trials. Ho YH, Want YC, Loh EW and Tam KW. *Journal of Hospital Infection* 101(4): 370-379, 2019.	This systematic review and meta-analysis compared the antiseptic efficacies of waterless hand rub (WHR) products, chlorhexidine gluconate (CHG) scrub products, and povidione-iodine (PI) scrub products in surgical settings. Colony-forming unit (CFU) counts, surgical site infection (SSI) rates, preference and compliance were determined to measure efficacies. Eleven randomised controlled trials involving 5,135 participants were included. Residual CFU counts were significantly lower in the WHR and CHG groups than in the PI group; the differences in CFU counts between the WHR and CHG groups were non-significant. No significant differences were observed in the SSI rates between the 3 groups. WHR were most preferred and associated with higher compliance rates.	None. Adds to evidence base.

Transmission Based Precautions:

Literature review	Papers identified	Summary of scientific findings	Impact on recommendations
Management of Care Equipment and Environmental Decontamination	Effectiveness of targeted enhanced terminal room disinfection on hospital-wide acquisition and infection with multidrug resistant organisms and *Clostridium difficile*: a secondary analysis of a multicentre cluster randomised controlled trial with crossover design (BETR Disinfection). Anderson DJ, Moehring RW, Weber DJ, Lewis SS, Chen LF, Schwab JC, Becherer P, Blocker M, Triplett PF, Knelson LP, Lokhnygina Y, Rutala WA, Sexton DJ and CDC Prevention Epicenters Program. *The Lancet Infectious Diseases* 18(8): 845-853, 2018.	This study was a planned secondary analysis of the results from a multicentre, cross-over cluster-randomised trial that assessed the effectiveness of four disinfection strategies for terminal room disinfection on hospital-wide incidence of multidrug-resistant organisms (meticillin-resistant *Staphylococcus aureus*, vancomycin-resistant enterococci (VRE), or multidrug-resistant *Acinetobacter* spp.) and *Clostridiodes difficile* in nine US hospitals. The four strategies were: standard disinfection (quaternary ammonium disinfectant, except for *C. difficile* for which 10% sodium hypochlorite was used); standard disinfection and disinfecting ultraviolet light (UV-C); 10% sodium hypochlorite (bleach strategy); and bleach and UV-C (bleach and UV strategy). Each strategy was randomly assigned for 7 months including a 1 month wash-in period. There was no significant difference in the hospital-wide risk of target organism acquisition between standard disinfection and the 3 enhanced terminal disinfection strategies for all target multi-drug resistant organisms. Enhanced terminal room disinfection with UV in a targeted subset of high-risk rooms led to a decrease in hospital-wide incidence of *C. difficile* and VRE.	None. Adds to evidence base.
Respiratory Protective Equipment (RPE) **Cough Etiquette/ Respiratory Hygiene**	Face Masks and Cough Etiquette Reduce the Cough Aerosol Concentration of Pseudomonas aeruginosa in People with Cystic Fibrosis. Wood ME, Stockwell RE, Johnson GR, Ramsay KA, Sherrard LJ, Jabbour N, Ballard E, O'Rourke P, Kidd TJ, Wainwright CE, Knibbs LD, Sly PD, Morawska L, Bell SC. *American Journal of Respiratory & Critical Care Medicine.* 197(3): 348-355, 2018.	In this study 25 adults with Cystic Fibrosis and chronic *Pseudomonas aeruginosa* infection performed six talking and coughing manoeuvres with or without face masks (surgical and N95) and hand covering the mouth when coughing (cough etiquette) in an aerosol sampling device. An Andersen Cascade Impactor was used to sample the aerosol at 2 meters from each participant. Quantitative sputum and aerosol bacterial cultures were performed and participants rated the mask comfort levels. Cough etiquette provided approximately half the reduction of viable aerosols of the mask interventions during voluntary coughing. A similar reduction in total colony-forming units was observed for both masks during coughing yet participants rated the surgical masks as more comfortable.	None. Adds to evidence base.
Patient Placement, Isolation and	Association between healthcare-associated infection and exposure to hospital roommates and previous bed occupants	This case-control study was carried out to determine the association between having a prior bed occupant or roommate with a positive blood, respiratory, urine or	None.

Cohorting	with the same organism. Cohen B, Liu J, Cohen AR and Larson E. *Infection Control & Hospital Epidemiology* 39(5): 541-546, 2018.	wound culture and subsequent infection with the same organism. Four hospitals were included in the study including a 221-bed community hospital, a 283-bed paediatric acute-care hospital, a 647-bed adult tertiary-/quaternary-care hospital and a 914 paediatric and adult tertiary-/quaternary-care hospital. The study was conducted on all patients discharged between 2006 and 2012 (n=761,426). Cases were all individuals who developed a healthcare associated infection with *Staphylococcus aureus, Acinetobacter baumannii, Streptococcus pneumoniae, Pseudomonas aeruginosa, Klebsiella pneumoniae, Enterococcus faecalis,* or *Enterococcus faecium.* Controls were uninfected patients who were matched by date (fiscal quarter), length of stay and hospital. The study found that the odds of cases where a previous bed occupant had positive culture, individuals were 5.83 times more than that of controls. The odds of cases having been exposed to a roommate with the same organism were 4.82 times that of controls (95% CI, 3.67-6.34).	Adds to evidence base.
Patient Placement, Isolation and Cohorting	Exposure to infected/colonized roommates and prior room occupants increases the risks of healthcare-associated infections with the same organism. Wu YL, Yang XY, Ding XX, Li RJ, Pan MS, Zhao X, Hu XQ, Zhang JJ and Yang LQ. *Journal of Hospital Infection* 101(2): 231-239, 2019.	This meta-analysis investigated whether pathogenic organisms can be transmitted from roommates and prior room occupants to other inpatients and thus increase the risk of healthcare-associated infections (HAIs). Twelve studies were included that reported risk from exposure to infected/colonized roommates and 9 studies reported risk from prior room occupants. The studies on roommates found that exposure was associated with increased risk of HAIs of the same organism (odds ratio 2.69, 95% CI 1.61-4.49). The studies on prior room occupants resulted in increased risk with odds ratio of 1.96 (95% CI 1.36-2.68). Sensitivity analyses did not show major changes in overall findings and no publication bias was detected.	None.