

Infection prevention and control: a guide for community nurses

Francesca Ramadan

Freelance healthcare writer

francescaramadan@gmail.com

Although infection prevention and control (IPC) has always been a priority in healthcare systems, the COVID-19 pandemic highlighted its necessity and importance in safeguarding the health and safety of both healthcare professionals and patients alike. However, the risk posed to both professionals and patients by a lack of IPC measures is not limited to COVID-19 or other respiratory viruses and infectious diseases; robust IPC is associated with the effort to combat antimicrobial resistance (AMR) and improve the overall quality and resilience of healthcare. The dangers associated with the transmission of the emergence and spread of drug-resistant pathogens cannot be overstated: the World Health Organization (WHO) has declared AMR to be one of the top 10 global public health threats facing humanity (WHO, 2021). However, simple IPC measures can make a big difference. A study by Song et al (2013) showed that hand hygiene compliance at 80% or higher in a neonatal intensive care unit was associated with a 48% further reduction of methicillin-resistant *Staphylococcus aureus* acquisition. Alongside reducing infection, IPC also brings cost-saving benefits; in 2011, Chen et al (2011) estimated that every US\$1 spent on hand hygiene promotion could result in a US\$23.7 benefit.

The Centers for Disease Control and Prevention (2022) estimate that, each day, approximately one in 31 US patients and one in 43 nursing home residents contracts at least one health-associated infection, underscoring the need for improvements in patient care practices. While much

progress has been made, more needs to be done to prevent healthcare-associated infections in a variety of settings.

Infection control and prevention measures for the community nurse

Standard infection control precautions (SICPs) are the basic IPC measures necessary to reduce the risk of spreading pathogens. Much guidance on the practice of SICPs focuses on the clinical setting; however, community nurses often face the unique challenge of maintaining IPC in the patient's home, which often involves the provision of care in uncontrolled and unsterile environments. Measures to mitigate the risk of infection in patients' homes and in residential care settings often incorporates the following SCIPs.

Hand hygiene

Correct hand hygiene, following the seven-stage handwashing technique promoted by the WHO (2009), is one of the cornerstones of effective IPC. However, as noted by Payne and Peache (2021), knowing when, as well as how, to decontaminate hands is equally important. The Five Moments of Hand Hygiene (WHO, 2009) is a valuable tool in the assessment of the appropriate moments to sanitise or wash hands, which include:

- Before contact with a patient and/or their surroundings (alcohol-based handrubs (ABHRs))
- Before clean/aseptic procedure: hands must be clean before any procedure that breaks the body's defensive barrier, such as wound care, re-catheterisation, administration of intravenous medications and intramuscular injections (soap and water)
- After contact/potential contact with blood or body fluids, such as during catheterisation, wound care, changing urinary catheters, bowel care and specimen collection (soap and water)
- After contact with a patient (ABHRs and/or soap and water)
- After leaving a patient's environment (ABHRs and/or soap and water).

Abstract

The onset of the COVID-19 pandemic highlighted the importance of infection prevention and control (IPC), and accentuated the need for better health and safety measures to protect both healthcare professionals and their patients.

In this article, Francesca Ramadan provides an overview of IPC measures for community nurses, such as hand hygiene and personal protective equipment, along with the safe management of care equipment and the care environment.

Keywords: Infection prevention and control • hand hygiene • personal protective equipment • care equipment • community care



Copyright: Suterren Studio via Adobe Stock

Figure 1. Correct hand hygiene is one of the cornerstones of infection prevention and control. The World Health Organization's Five Moments of Hand Hygiene is a valuable tool for the assessment of the appropriate moments to sanitise or wash hands. Source: World Health Organization (2009)

ABHRs must have a minimum alcohol concentration of 60%, conform to the British Standard BS EN 1500:2013 and should be applied using the correct technique, which involves applying the solution and rubbing hands together until it has evaporated (Department of Health and Social Care (DHSC), 2022).

However, ABHRs are not always suitable, particularly for those with existing skin conditions, as the active ingredients that effectively eliminate pathogens can also be damaging to the skin. Angelova-Fischer et al (2020) demonstrated significant differences in the severity of barrier function impairment after exposure to different concentrations of n-propanol between an atopic dermatitis population in the stage of remission and healthy controls. Alcohol-free hand rubs (AFHRs) can be a suitable alternative for those with existing skin conditions. AFHRs often contain antimicrobial agents such as quaternary ammonium compounds, the most common being benzalkonium chloride, which can work well for bacteria and fungi (Golin et al, 2020). One study demonstrated that pathogenic colonisation of the fingertips was reduced after application of a guanidine-based product, based on in vitro colony-forming unit counts from a total of 268 fingerprint samples from healthcare workers (Agthe et al, 2009). Solutions containing chlorhexidine, an antiseptic, have also been shown to be effective; in a study comparing isopropyl alcohol (60%) and chlorhexidine hand gels, both products resulted in significant reductions in aerobic bacteria, but only the chlorhexidine product resulted in significant reductions in anaerobic bacteria counts after application (Nhung et al, 2007). Likewise, in the same study, it was demonstrated that, at 3 hours following a hand rub, the reduction in resident skin flora was greater with a chlorhexidine product when compared to a 62% ethanol gel (Nhung et al, 2007).

Generally, ABHR are the recommended product for hand hygiene practice in healthcare settings; however, AFHR have been shown to be an effective hand disinfectant that cause relatively minimal skin irritation and can serve as a hand hygiene alternative in situations in which ABHRs cannot be used.

Personal protective equipment

Community practitioners should assess the use of personal protective equipment (PPE) by considering the likelihood of exposure to blood, body fluids, secretions or excretions, risks associated with the procedure, and the risk of transmission of pathogens. Avoiding overuse or inappropriate use of PPE is key to eliminating the spread of infection and minimising its environmental impact (NHS England, 2023). For nurses supporting people in their own home, storing PPE in a dry, clean, dust-free environment, such as in sealed containers in the person's home (with their permission) or in the nurse's vehicle, may be appropriate (DHSC, 2022).

Gloves must be worn when exposure to blood and/or other body fluids, non-intact skin or mucous membranes, is anticipated or likely. They should be changed immediately after each patient and/or after completing a procedure/task on the same patient, and never decontaminated with ABHR or soap between use (NHS England, 2023).

Aprons must be worn to protect uniform or clothes when contamination is anticipated, which is most likely to occur during activities such as leg ulcer care and bandaging, especially during washing of the legs; bowel care; and dressing changes for heavily exuding wounds (Payne and Peache, 2021).

Facial protection is not as commonly utilised in community nursing; however, where there is a risk of splashing of blood

or body fluids into the nurse's nose or mouth, type IIR fluid-repellent surgical masks protect the wearer and provide additional protection from respiratory droplets (DHSC, 2022). These should not be worn for longer than 4 hours, and must be disposed of after care is completed, or when the mask is damaged or becomes moist (DHSC, 2022).

Safe management of care equipment and the environment

Care equipment and the care environment is easily contaminated, thereby facilitating the easy transfer of pathogens between people and locations. Reusable non-invasive care equipment must be decontaminated after each use and before leaving the patient's home. This may be achieved with a detergent solution (NHS England, 2023). However, as noted by Payne and Peache (2021), very few patient homes have sinks that fully comply with hygiene regulations and, sometimes, no sink is available, either because it is broken, dirty or full of dishes. Therefore, preparing a detergent solution may not be possible. Approved detergent wipes may be appropriate in this instance. Detergent wipes are formulated to remove contamination from surfaces (that is, to physically clean), while disinfectant wipes contain specific antimicrobial agents and are used to inactivate bioburden on surfaces (Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland, 2022). Peracetic acid/hydrogen peroxide pre-impregnated disinfectant wipes were found to significantly reduce surface microbial bioburden from high-touch surfaces in two wards compared to the standard practice (detergent cleaning with cloth soaked in a bucket containing 1000 ppm chlorine). Detergent wipes were found to be effective in efficiently removing *Acinetobacter baumannii* (ARHAI Scotland, 2022), which is a multidrug-resistant organism known to colonise infusion pumps, indwelling urinary catheters, bed rails and tabletops (Manchanda et al, 2010). The use of detergent wipes is acceptable for cleaning surfaces/frequently touched sites within the care area (NHS England, 2023) and, if a community nurse is using a hard surface to lay out a sterile field, it should first be cleaned with a wipe, which can remove any potential contamination (Payne and Peache, 2021).

Conclusions

IPC is a significant part of the community nurse's role and there are a variety of measures to protect the patient and the professional during care delivery. A risk assessment incorporating consideration of the risks of cross-contamination is an essential first step to any patient visit.

This should be used alongside any of the aforementioned or other SCIPS, which form the community nurse's ICP toolkit. **BJCN**

Accepted for publication: March 2023

Declaration of interest: None

- Agthe N, Terho K, Kurvinen T et al. Microbiological efficacy and tolerability of a new, non-alcohol-based hand disinfectant. *Infect Control Hosp Epidemiol.* 2009;30(7):685–690. <https://doi.org/10.1086/598239>
- Angelova-Fischer I, Soltanipoor M, Stilla T et al. Barrier damaging effects of n-propanol in occlusion-modified tandem repeated irritation test: modulation by exposure factors and atopic skin disease. *Contact Dermatitis.* 2020;82(1):1–9. <https://doi.org/10.1111/cod.13368>
- Antimicrobial Resistance and Healthcare Associated Infection Scotland. Literature review and recommendations: existing and emerging technologies used for decontamination of the healthcare environment: wipes; version 2.0. 2022. <https://www.nss.nhs.scot/media/3534/wipes-literature-review-v2.0.pdf> (accessed 1 March 2023)
- Booq RY, Alshehri AA, Almughem FA et al. Formulation and evaluation of alcohol-free hand sanitizer gels to prevent the spread of infections during pandemics. *Int J Environ Res Public Health.* 2021;18:6252. <https://doi.org/10.3390/ijerph18126252>
- Centers for Disease Control and Prevention. HAI and Antibiotic Use Prevalence Survey. 2022. <https://www.cdc.gov/hai/eip/antibiotic-use.html> (accessed 1 March 2023)
- Chen YC, Sheng WH, Wang JT et al. Effectiveness and limitations of hand hygiene promotion on decreasing healthcare-associated infections. *PLoS One.* 2011;6(11):e27163. <https://doi.org/10.1371/journal.pone.0027163>
- Department of Health and Social Care. Guidance: Infection prevention and control: resource for adult social care. 2022. <https://www.gov.uk/government/publications/infection-prevention-and-control-in-adult-social-care-settings/infection-prevention-and-control-resource-for-adult-social-care> (accessed 1 March 2023)
- Golin AP, Choi D, Ghahary A. Hand sanitizers: a review of ingredients, mechanisms of action, modes of delivery, and efficacy against coronaviruses. *Am J Infect Control.* 2020;48(9):1062–1067. doi: 10.1016/j.ajic.2020.06.182
- Manchanda V, Sanchaita S, Singh N. Multidrug resistant acinetobacter. *J Glob Infect Dis.* 2010;2(3):291–304. <https://doi.org/10.4103/0974-777X.68538>
- Nhung DT, Freydiere AM, Constant H et al. Sustained antibacterial effect of a hand rub gel incorporating chlorhexidine-loaded nanocapsules (Nanochlorex). *Int J Pharm.* 2007;334(1–2):166–172. doi: 10.1016/j.ijpharm.2006.10.017
- NHS England. National infection prevention and control. 2023. <https://www.england.nhs.uk/publication/national-infection-prevention-and-control/> (accessed 1 March 2023)
- Payne D, Peache M. The challenge of infection control in patients' homes. *Brit J Comm Nurs.* 2021;26(4):168–174. <https://doi.org/10.12968/bjcn.2021.26.4.168>
- Song X, Stockwell DC, Floyd T et al. Improving hand hygiene compliance in health care workers: strategies and impact on patient outcomes. *Am J Infect Cont.* 2013;41(10):e101–e105. <https://doi.org/10.1016/j.ajic.2013.01.031>
- World Health Organization. WHO Guidelines on hand hygiene in health care. 2009. https://apps.who.int/iris/bitstream/handle/10665/44102/9789241597906_eng.pdf;jsessionid=2F9604080708CB2715D4ACAF90AE3D25?sequence=1 (accessed 1 March 2023)
- World Health Organization. Antimicrobial resistance. 2021. <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance> (accessed 1 March 2023)