



INTERNATIONAL
SOCIETY
FOR INFECTIOUS
DISEASES

GUIDE TO INFECTION CONTROL IN THE HEALTHCARE SETTING

Healthcare Personnel Attire in Non-Operating Room Settings

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KEY ISSUES

The role of healthcare personnel (HCP) attire in cross-transmission of pathogens remains unclear. Guidance on HCP attire in non-operating room settings should attempt to balance professional appearance, comfort, and practicality with the potential risk that attire will contribute to the spread of nosocomial microbes. Institutions considering these optional measures should introduce them with a well-organized communication and education effort directed at both HCP and patients.

KNOWN FACTS

- There is a growing awareness of the potential role of fomites in the transmission of healthcare-associated microorganisms.
- Studies have demonstrated contamination of HCP apparel (scrubs, white coats, ties) with potential pathogens, although the role of clothing in transmission of these microorganisms to patients has not been established.
- Most studies on patient attitudes toward HCP attire indicate that patients favor formal attire, including a white coat.
- Patients generally do not perceive white coats, formal attire, or neckties as posing infection risks; however, when informed of potential risks associated with certain types of attire, patients are willing to change their preferences for physician attire.
- No clinical studies have demonstrated cross-transmission of healthcare-associated pathogens from a HCP to a patient via apparel. A number of small prospective trials have documented contamination of HCP apparel with a variety of pathogens. These findings raise a hypothetical concern for pathogen cross-transmission to patients.
- Nametags have been identified consistently by patients as an important component of HCP attire.

Controversial Issues

- The United Kingdom (U.K.) has adopted a BBE approach ("bare below the elbows"—wearing of short sleeves and no wristwatch, jewelry, or ties during clinical practice), based on the theory that the strategy will limit patient contact with contaminated HCP apparel and promote better hand and wrist hygiene.
- The impact of BBE on HCP bacterial counts remains poorly defined. One randomized trial comparing bacterial contamination of white coats against BBE found no difference in total bacterial or MRSA counts (on either the apparel itself or the volar surface of the wrist) at the end of an eight-hour workday.
- Uptake of BBE in healthcare settings has been variable.
- To date there is no definitive evidence that a BBE approach to inpatient care results in improved hospital-acquired infection (HAI) outcomes.
- The optimal frequency for laundering apparel is not clear based on the current literature. Apparel worn at the bedside that comes in contact with the patient or patient environment should ideally be laundered after daily use.
- Whether HCP attire for non-surgical settings should be laundered at home or professionally remains uncertain. A combination of washing at higher temperatures and tumble drying or ironing has been associated with elimination of both pathogenic Gram-positive and Gram-negative bacteria from HCP clothing.

SUGGESTED PRACTICE

- Although the choice of HCP attire may affect infection rates, evidence-based measures to prevent HAIs (e.g., hand hygiene, appropriate device insertion and care, isolation of patients with communicable diseases, environmental disinfection) should take priority.

- Facilities may consider adoption of a BBE approach to inpatient care as an infection prevention adjunct. There are no data to guide the optimal choice of alternate attire, such as scrub uniforms or other short-sleeved personal attire. This approach is supported by biological plausibility and is unlikely to cause harm.
- In facilities where white coats are used for professional appearance, commonsense measures should be considered. HCP engaged in direct patient care should possess two or more white coats and have access to a convenient and economical means to launder white coats. Also, institutions should provide coat hooks that would allow HCP to remove their white coat (or other long-sleeved outerwear) prior to contact with patients or patients' immediate environment.
- Neckties should be secured to prevent them from coming into direct contact with patients or patients' immediate environment.
- Any apparel worn at the bedside that comes in contact with patients or patients' environment should be laundered after daily use.
- If laundered at home, apparel should be washed in a hot water wash cycle followed by a cycle in the dryer.
- All HCP footwear should have closed toes, low heels, and non-skid soles.

SUGGESTED PRACTICE IN UNDER-RESOURCED SETTINGS

The practices listed above are equally applicable to under-resourced settings.

SUMMARY

- The role of HCP attire in cross-transmission of nosocomial pathogens has not been established. HCP attire frequently becomes contaminated with bacteria during the course of clinical care. This includes scrubs, neckties, and white coats, with pathogens such as *Staphylococcus aureus*, methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci (VRE), and Gram-negative bacilli. The impact of apparel microbial burden on occurrence of HAI is undefined. Although patients frequently express preferences for certain types of HCP attire, including white coats, they were willing to change their preferences when informed of potential risks associated with HCP attire. Patient comfort, satisfaction, trust, and confidence in their physicians is unlikely to be affected by practitioners' attire choice, with the exception of name tags, which they viewed as essential.
- A BBE approach is in effect in the U.K. for inpatient care; this strategy may enhance hand hygiene to the level of the wrist, but its impact on HAI rates remains unknown. Facilities may consider adoption of a BBE approach to inpatient care as an adjunctive infection prevention measure. The optimal choice of alternate attire, such as scrub uniforms, remains unknown. This strategy is supported by biological plausibility and is unlikely to cause harm. In facilities where white coats are used for professional appearance, HCP engaged in direct patient care should possess two or more white coats and have access to a convenient means of laundering the white coats. The benefit of institutional laundering of HCP scrubs versus home laundering for non-OR use

remains unproven. Institutions should provide coat hooks that would allow HCP to remove their white coat (or other long-sleeved outerwear) prior to contact with patients or the patient's immediate environment.

- Ties should be fastened so as to not come into direct contact with the patient or immediate patient care environment. Shoes should have closed toes, low heels, and non-skid soles. Nametags should be used and easily visible.

REFERENCES

1. Ardolino A, Williams LA, Crook TB, Taylor HP. Bare below the Elbows: What Do Patients Think? *J Hosp Infect.* 2009; 71(3):291–3. doi: 10.1016/j.jhin.2008.11.008
2. Baevsky RH, Fisher AL, Smithline HA, Salzberg MR. The Influence of Physician Attire on Patient Satisfaction. *Acad Emerg Med.* 1998; 5(1):82–4.
3. Bond L, Clamp PJ, Gray K, Van Dam, V. Patients' Perceptions of Doctors' Clothing: Should We Really Be 'Bare below the Elbow'? *J Laryngol Otol.* 2010; 124(9):963–6. doi: 10.1017/S0022215110001167.
4. Fischer RL, Hansen CE, Hunter RL, Veloski JJ. Does Physician Attire Influence Patient Satisfaction in an Outpatient Obstetrics and Gynecology Setting? *Am J Obstet Gynecol.* 2007; 196(2):186.e1–5.
5. Gallagher J, Waldron Lynch F, Stack J, Barragry J. Dress and Address: Patient Preferences Regarding Doctor's Style of Dress and Patient Interaction. *Ir Med J* 2008; 101(7):211–3.
6. Gherardi G, Cameron J, West A, Crossley M. Are We Dressed to Impress? A Descriptive Survey Assessing Patients' Preference of Doctors' Attire in the Hospital Setting. *Clin Med (Lond).* 2009; 9(6):519–24.

7. Hueston WJ, Carek SM. Patients' Preference for Physician Attire: a Survey of Patients in Family Medicine Training Practices. *Fam Med* 2011; 4(9):643–7.
8. Ikusaka M, Kamegai M, Sunaga T, et al. Patients' Attitude toward Consultations by a Physician without a White Coat in Japan. *Intern Med* 1999; 38(7):533–6.
9. Li SF, Haber M. Patient Attitudes toward Emergency Physician Attire. *J Emerg Med*. 2005; 29(1):1–3.
10. Major K, Hayase Y, Balderrama D, Lefor AT. Attitudes Regarding Surgeons' Attire. *Am J Surg* 2005; 190:103–106.
11. Matsui D, Cho M, Rieder MJ. Physicians' Attire as Perceived by Young Children and Their Parents: the Myth of the White Coat Syndrome. *Pediatr Emerg Care*. 1998; 14(3):198–201.
12. McKinstry B, Wang JX. Putting on the Style: What Patients Think of the Way Their Doctor Dresses. *Br J Gen Pract*. 1991; 41(348):270, 275–8.
13. Nair BR, Attia JR, Mears SR, Hitchcock KI. Evidence-Based Physicians' Dressing: a Crossover Trial. *Med J Aust* 2002; 177:681–2.
14. Palazzo S, Hocken DB. Patients' Perspectives on How Doctors Dress. *J Hosp Infect*. 2010 ; 74(1):30–4. doi: 10.1016/j.jhin.2009.08.021.
15. Rehman SU, Nietert PJ, Cope DW, Kilpatrick AO. What to Wear Today? Effect of Doctor's Attire on the Trust and Confidence of Patients. *Am J Med*. 2005; 118(11):1279–86.
16. Shelton CL, Raistrick C, Warburton K, Siddiqui KH. Can Changes in Clinical Attire Reduce Likelihood of Cross-Infection without Jeopardising the Doctor-Patient Relationship? *J Hosp Infect*. 2010; 74(1):22–9. doi: 10.1016/j.jhin.2009.07.031.
17. Baxter JA, Dale O, Morrith A, Pollock JC, et al. Bare Below the Elbows: Professionalism vs. Infection Risk. *Bull R Coll Surg Engl*. 2010; 92:248–51.

18. Toquero L , Aboumarzouk O , Owers C, et al. Bare below the Elbows — The Patient's Perspective. *Quality and Patient Safety*. 2011; 2(4):WMC001401.
19. Munoz-Price LS, Arheart KL, Lubarsky DA, Birnbach DJ. Differential Laundering Practices of White Coats and Scrubs among Health Care Professionals. *Am J Infect Control*. 2013; 41(6):565–7. doi: 10.1016/j.ajic.2012.06.012.
20. Burden M, Cervantes L, Weed D, et al. Newly Cleaned Physician Uniforms and Infrequently Washed White Coats Have Similar Rates of Bacterial Contamination after an 8-Hour Workday: a Randomized Controlled Trial. *J Hosp Med*. 2011; 6(4):177–82. doi: 10.1002/jhm.864.
21. Gaspard P, Eschbach E, Gunther D, et al. Meticillin-Resistant *Staphylococcus aureus* Contamination of Healthcare Workers' Uniforms in Long-Term Care Facilities. *J Hosp Infect*. 2009; 71(2):170–5. doi: 10.1016/j.jhin.2008.10.028.
22. Loh W, Ng VV, Holton J. Bacterial Flora on the White Coats of Medical Students. *J Hosp Infect*. 2000; 45(1):65– 8.
23. Lopez PJ, Ron O, Parthasarathy P, et al. Bacterial Counts from Hospital Doctors' Ties Are Higher Than Those from Shirts. *Am J Infect Control*. 2009; 37(1):79–80. doi: 10.1016/j.ajic.2008.09.018.
24. Treakle AM, Thom KA, Furuno JP, et al. Bacterial Contamination of Health Care Workers' White Coats. *Am J Infect Control*. 2009; 37(2):101–5. doi: 10.1016/j.ajic.2008.03.009.
25. Wiener-Well Y, Galuty M, Rudensky B, et al. Nursing and Physician Attire as Possible Source of Nosocomial Infections. *Am J Infect Control*. 2011; 39(7):555–9. doi: 10.1016/j.ajic.2010.12.016.
26. Munoz-Price LS, Arheart KL, Mills JP, et al. Associations between Bacterial Contamination of Health Care Workers' Hands and Contamination of White Coats and Scrubs. *Am J Infect Control*. 2012; 40(9):e245–8. doi: 10.1016/j.ajic.2012.03.032.

27. Burger A, Wijewardena C, Clayson S, Greatorex RA. Bare below Elbows: Does This Policy Affect Handwashing Efficacy and Reduce Bacterial Colonisation? *Ann R Coll Surg Engl.* 2011; 93(1):13–6. doi: 10.1308/003588410X12771863936882.
28. Willis-Owen CA, Subramanian P, Kumari P, Houlihan-Burne D. Effects of 'Bare below the Elbows' Policy on Hand Contamination of 92 Hospital Doctors in a District General Hospital. *J Hosp Infect.* 2010; 75(2):116–9. doi: 10.1016/j.jhin.2009.12.013.
29. Farrington RM, Rabindran J, Crocker G, et al. 'Bare below the Elbows' and Quality of Hand Washing: a Randomised Comparison Study. *J Hosp Infect.* 2010; 74(1):86–8. doi: 10.1016/j.jhin.2009.09.016.
30. Jacob G. Uniforms and Workwear: an Evidence Base for Developing Local Policy. NHS Department of Health Policy [serial online] 2007.