Published in final edited form as:

Am J Infect Control. 2018 January ; 46(1): 115–117. doi:10.1016/j.ajic.2017.05.011.

What Do Visitors Know and How Do They Feel About Contact Precautions?

Grace Seibert^a, Tola Ewers, MS, PhD^b, Anna K. Barker, BA^c, Adam Slavick^a, Marc-Oliver Wright, MS, MT(ASCP) CIC, FAPIC^a, Linda Stevens, DNP, RN-BC, CPHQ, CSPHP^e, and Nasia Safdar, MD, PhD^{a,b,d}

^aInfection Control, University of Wisconsin Hospital and Clinics, 600 Highland Ave., Madison, WI 53792

^bDivision of Infectious Diseases, Department of Medicine, University of Wisconsin School of Medicine and Public Health, 1685 Highland Ave., 5th Floor, Madison, WI 53705

^cDepartment of Population Health Sciences, University of Wisconsin School of Medicine and Public Health, 610 N. Walnut St., 707 WARF Building, Madison, WI 53726

^dWilliam S. Middleton Memorial Veterans Hospital, 2500 Overlook Terrace, Madison, WI 53705

^eNursing Quality and Safety, University of Wisconsin Hospital and Clinics Authority, 600 Highland Ave., Madison, WI 53792

Abstract

Patients with *Clostridium difficile* infection (CDI) are placed in contact precautions. We surveyed 31 visitors of CDI patients to understand their compliance, knowledge, and perceptions of contact precautions. While most visitors knew where to find the required personal protective equipment, only 42% were fully compliant with gown and gloves. Family members accounted for 90% of visitors, and roughly half of the reasons given for not gowning were related to a lack of perceived risk for family members. Nursing staff are fundamental sources of PPE information for visitors; however, we found variation in staff communication regarding need for visitor PPE use.

Keywords

Clostridium difficile infection; visitor knowledge and perceptions; barrier precautions; personal protective equipment; infection prevention; SEIPS Model

INTRODUCTION

Clostridium difficile infection (CDI) is a major hospital-acquired infection that results in 500,000 cases and 29,000 deaths each year in the U.S.^{1–3} Prevention of *C. difficile* transmission in healthcare settings is essential.

The Centers for Disease Control and Prevention recommend healthcare workers use personal protective equipment (PPE) when caring for patients with CDI. However, their guidelines make no specific recommendations for visitors' use of PPE and note recommendations may vary by facility and be determined based on the level of visitor-to-patient interaction.⁴ The Society for Healthcare Epidemiology of America recommends requiring visitors to use PPE if the policy can be effectively implemented.⁵

The ambiguity in these guidelines stems from a lack of studies on PPE use for CDI patient visitors, as most existing studies have focused on healthcare workers. However, one large statewide study of visitor PPE use found that only 14% of surveyed North Carolina hospitals monitored visitor compliance. Twenty-eight percent of these hospitals also reported difficulty achieving visitor compliance.⁶ We conducted a qualitative study to evaluate visitors' compliance and perceptions of PPE use.

METHODS

The study was carried out over three months at a 505-bed Midwestern tertiary-care hospital. The facility places all CDI patients under contact precautions. At any given time, approximately 10% of hospitalized patients are on contact precautions, although not all for CDI. Only visitors of suspected or confirmed CDI patients were eligible for participation. We surveyed visitors of adult inpatients selected randomly from the hospital's list of patients with confirmed or suspected CDI. The project was considered quality improvement and exempt from Institutional Review Board approval.

If a visitor was present in the selected CDI patient's room, a trained interviewer entered the room, provided a description of the study, and obtained verbal consent from the patient and visitor. Field notes were taken regarding the hospital unit, time of day, type of isolation, visitor's relationship to the patient, and PPE compliance. A qualitative, open-ended, interviewer-administered survey was to ascertain visitor knowledge and perceptions of enhanced contact precautions (see appendix). Alternate wording and skip logic were used to allow the questions to vary based on visitors' PPE compliance. Of note, enhanced contact precautions include hand hygiene with soap and water and environmental cleaning with a sporicidal product. Since this project focused on PPE, we have stated contact precautions in the text.

The survey was developed using the Systems Engineering Initiative for Patient Safety (SEIPS) conceptual framework. This model demonstrates how the work system affects patient outcomes by examining complex interactions through a human factors engineering lens.⁷ The model has been used as the conceptual framework in over 50 studies, including several focused on infection control.⁸

After data collection, field notes and survey responses were reviewed using the SEIPS framework. All open-ended responses were coded into one of the five SEIPS work system components: task, person, physical environment, tools and technology, and organization. The content was then further categorized based on the overarching theme and descriptive analyses were performed. For example, when evaluating the question assessing motivation

for glove usage, responses were categorized into healthcare worker, signage, and other factors. For cases in which a participant's response met criteria for more than one answer category, the response was counted in both categories.

RESULTS

Most study participants were family members (28/31, 90%), with spouse being the most common relationship (12/30, 40%). A majority of participants (22/31, 71%) had previous experience visiting a patient in contact precautions.

Full PPE compliance, defined as wearing both gown and gloves at the time of the interview, was the principle SEIPS *process* measure evaluated. Forty-two percent of participants were fully compliant with contact precautions (Table 1). Compliance and perceptions regarding the individual use of gown or gloves were related to the SEIPS *task* element. Among visitors wearing PPE, the majority wore gloves and/or gowns because they were told to do so by nursing staff, with door signage reported as the second most common reason (Table 1): “[Staff PPE use] made me more aware and increased the second nature of the request.” However, healthcare worker actions were also a motivating factor for non-compliance: “I started to see that the hospital staff wasn’t gowned and gloved, and I was never really told to wear it, so I stopped.”

Visitor’s PPE knowledge was considered under the SEIPS *person* element. Many visitors reported that gowns and gloves were necessary to prevent spread of infection (Table 1), as the patient they were visiting was confirmed to have an infection or was being tested for a suspected infection. However, a few participants felt that the protective effect was limited for family members. “I thought they [gowns] were necessary for others, but we live together, so I probably have whatever he has.” Heat and discomfort were the biggest reported barriers to PPE compliance.

The SEIPS *physical environment* construct was evaluated via visitors’ knowledge of the location of PPEs. The majority of visitors were aware of PPE locations. Nursing staff was the most common source of this information (Table 1): “It’s [PPE] all pretty easy to find, once you ask the nurse or something.” All visitors but one agreed there was adequate access to PPE.

Questions regarding PPE comfort and accessibility measured the SEIPS component of *tools and technology*. A large majority (25/31, 81%) felt that nothing could be changed to improve PPEs: “They have to be barriers. They have to be hot.” However, there were several suggestions that posting information near PPE with an explanation about how to put on PPE and why it is needed would be beneficial. Language about latex gloves should also be explicit, in case a visitor has allergy concerns.

DISCUSSION

We found that despite signage and a readily available PPE supply, only 42% of surveyed visitors were fully compliant with gowns and gloves. This level of compliance is consistent with other observational studies.^{5–6}

Healthcare worker practices and instructions, either to wear or not wear the PPE, played a key role in determining visitor compliance outcomes. Thus, our data suggest a need to educate healthcare workers on the importance that their behavior has for downstream visitor contact precautions compliance and to encourage them to model PPE use and educate visitors directly. Emphasizing that PPE protects both visitors and other patients may motivate visitors to comply.

Limitations of our study include a small sample size and a single site. Future studies should extend to hospitals with varying visitor policies, healthcare worker workflows, and systems of enforcement.

Our study demonstrates room for improvement regarding visitor compliance and knowledge of contact precautions. Implementation of educational programs for healthcare workers and visitors would likely contribute to increased compliance with PPE.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Funding: This work was supported by the VHA National Center for Patient Safety Center of Inquiry United States (U.S.) Department of Veterans Affairs. The views expressed in this article are those of the author(s) and do not represent the views of the U.S. Department of Veterans Affairs or the United States Government. This project also was supported by grant number R18HS024039 from the Agency for Healthcare Research and Quality. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Agency for Healthcare Research and Quality.

References

- Centers for Disease Control and Prevention Healthcare-associated Infections, Clostridium difficile, Clinicians. 2015; http://www.cdc.gov/hai/organisms/cdiff/Cdiff_clinicians.html Accessed October 12, 2016.
- Khanna S, Gupta A, Baddour LM, Pardi DS. Epidemiology, outcomes, and predictors of mortality in hospitalized adults with Clostridium difficile infection. *Intern Emerg Med*. 2016;11(5):657–665. [PubMed: 26694494]
- Dubberke ER, Carling P, Carrico R, et al. Strategies to prevent Clostridium difficile infections in acute care hospitals: 2014 update. *Infect Control Hosp Epidemiol*. 2014;35 Suppl 2:S48–65.
- Siegel JD, Rhinehart E, Jackson M, Chiarello L, Health Care Infection Control Practices Advisory C. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Health Care Settings. *Am J Infect Control*. 2007;35(10 Suppl 2):S65–164. [PubMed: 18068815]
- Munoz-Price LS, Banach DB, Bearman G, et al. Isolation precautions for visitors. *Infect Control Hosp Epidemiol*. 2015;36(7):747–758. [PubMed: 26017347]
- Kang J, Weber DJ, Mark BA, Rutala WA. Survey of North Carolina hospital policies regarding visitor use of personal protective equipment for entering the rooms of patients under isolation precautions. *Infect Control Hosp Epidemiol*. 2014;35(3):259–264. [PubMed: 24521591]
- Carayon P, Schoofs Hundt A, Karsh BT, et al. Work system design for patient safety: the SEIPS model. *Qual Saf Health Care*. 2006;15 Suppl 1:i50–58. [PubMed: 17142610]
- Holden RJ, Carayon P, Gurses AP, Hoonakker P, Hundt AS, Ozok AA, et al. SEIPS 2.0: A human factors framework for studying and improving the work of healthcare professionals and patients. *Ergonomics*. 2013;56:1669–86. [PubMed: 24088063]

Table 1.

Thematic summary of answers

Finding	Response, n (%)
Compliance (n = 31)	
Full (gown and gloves)	13 (41.9)
Partial (only gown)	8 (25.8)
Non-compliant (no gown or gloves)	10 (32.3)
Perceptions	
Hospital has adequate access to PPE (n=31)	30 (96.8)
Gowns are necessary to prevent the spread of infection (n=32) ^I	24 (75.0)
Gloves are necessary to prevent the spread of infection (n=33) ^I	21 (63.6)
Directionality of perceived gowning impact (n=32) ^I	
Gowns limit infection spread to others	12 (37.5)
Gowns limit infection spread to patients (or into patient rooms)	4 (12.5)
Gowns limit infection spread to self/visitors	8 (25.0)
Gowns have no impact on infection spread	1 (3.1)
Unsure of gown impact on infection spread	5 (15.6)
Other	2 (6.3)
Directionality of perceived gloving impact (n=33) ^I	
Gloves limit infection spread to others	12 (36.4)
Gloves limit infection spread to patients or patient rooms	4 (12.1)
Gloves limit infection spread to self/visitors	6 (18.2)
Gloves have no impact on infection spread	5 (15.2)
Unsure of glove impact on infection spread	3 (9.1)
Other	2 (6.1)
Motivation for wearing gown (n=21, 67.7%; 22 reasons given ^I)	
Nursing instructions	11 (52.4)
Door signage	4 (19.0)
Protect self	2 (6.5)
Other	5 (23.8)
Motivation for not wearing gown (n=10, 32.3%; 15 reasons given ^I)	
Immediate family member so lack of perceived risk	7 (46.7)
Discomfort	3 (20.0)
Hospital staff not wear PPE	2 (13.3)
Other	3 (20.0)
Motivation for wearing gloves (n=13, 41.9%; 16 reasons given ^I)	
Nursing instructions	6 (46.2)
Door signage	4 (30.8)

Finding	Response, n (%)
Protect self	2 (12.5)
Stop spread of infection	2 (12.5)
Other	2 (12.5)
Motivation for not wearing gloves (n=18, 58.1%; 20 reasons given ^I)	
Healthcare worker instructed not to wear/not told to wear	6 (30.0)
Discomfort/heat	5 (25.0)
Immediate family member so lack of perceived risk	4 (20.0)
Other	5 (25.0)
Knowledge	
Location of PPE (n=25)	
Known because of nursing instructions	15 (60.0)
Known because of seeking and finding on own	8 (32.0)
Other	2 (8.0)
Reason for signage instructing to wear PPE (n=33) ^I	
Patient has infection or is being tested to confirm infection type	17 (51.5)
To prevent spread of disease	11 (33.3)
Couldn't describe rationale or didn't see sign	5 (15.2)

^I A total of 31 participants participated in the study. For cases in which a participant's response met criteria for more than one answer category, the total of responses will exceed the number of participants answering the question.