

Personal Protective Equipment Use for Patients with *Clostridium difficile*

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### Abstract

In researching the literature on correct PPE by healthcare staff when a patient has *C. diff.* I have found that the policy on PPE for patients with *C. diff.* at Baptist Health Paducah is compliant. The theoretical framework used for this research is that of Imogene King. Their policy is evidence based and is also cost effective when it comes to preventing the spread of infection from patient to patient. There is no need for change to this policy at this time because it is supported by evidence in the literature.

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For this Evidence Based Project I have been researching personal protective equipment use with patients infected with *Clostridium difficile*. The facility whose policy I have chosen to review is Baptist Health Paducah.

Baptist Health Paducah's policy on the use of PPE for patients with *C. diff* is located under their infection control policies. These policies are to be followed by all people who come into contact with the patient who is on isolation precautions. This policy was last revised on April 23, 2015. Since the policy is thirty-one pages long, I will not be including all of it in this paper.

According to the policy at Baptist Health Paducah isolation signs are to be posted on the door going in to every patient's room that is on isolation precautions. These signs are posted on all the doors of the patients that are currently infected with *C. diff*. The sign that is posted for patients infected with *C. diff* are brown in color and have a large STOP sign on them. They show a gown, glove, and hand washing in pictures to the left of the sign. On the right are the procedures for correct PPE when coming into and leaving the room of a patient on contact spore precautions. For doctors and staff it states that they are to always wear a gown and gloves when entering the room of a patient and they are to wash their hands with soap and water after patient contact. For visitors to the patient the instructions read for them to always clean hands before visiting with the patient, always clean hands with soap and water after visiting the patient, and for visitors to wear a gown and gloves for contact with the patient. On the other side of this sign is displayed further ways for patients, family, and visitors to use correct PPE and stop the spread of *C. diff*. At the bottom of this form there are a list of things that the patient, family, or visitor is supposed to observe the doctors and staff doing before entering and after leaving the patient's room. In the isolation policy specific to contact spore precautions there are also instructions for

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how to put on your PPE and how to remove your PPE, always ending with washing hands with soap and water.

In researching I am looking to support the isolation precautions policies that have been implemented at Baptist Health Paducah. The theoretical framework that is guiding my research is that of Imogene King. Her theory defines the nursing process as a dynamic interpersonal process between the nurse, client, and health care team.

In a case-control study done by Jennifer A. Unger, Estella Whimbey, Michael G. Gravett, and David A. Eschenbach, they looked at *C. diff* infection rates among peripartum women at the University of Washington Medical Center. They found that most cases of transmitted *C. diff* in the hospital are because of improper use of PPE and hand washing. As part of their study they implemented an isolation precaution policy that would require all staff and visitors to wear a gown and gloves when entering the patient's room. Before and after leaving the room they would then wash their hands with soap and water. When patients' results came back with a positive reading of *C. diff* they were placed on strict isolation precautions in which they would be placed in a single occupancy room rather than a double occupancy room. In surgery, they surgeons were required to start using a water based soap for the first wash of the day instead of an alcohol based product. On the labor and delivery unit there was also a change room installed near the operating room that was always stocked with fresh scrubs for staff to change into if need be.

The results of this case study proved to be inconclusive as to whether it was the correction in PPE policy that made a difference and ended the outbreak of *C. diff* or a change in the antibiotic protocol. That being said, the hospital had up until the date of this publication only had one other infection of *C. diff* reported.

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According to Isabelle Guillemin, et al, when patients come in with *C. diff* there is a significant change in the nurse's day. The steps that are taken to control the spread of infection are guided by policy that has been created by members of the healthcare facility. These steps often include patient isolation, the use of gloves and gowns by all who enter the patient's room, and proper hand hygiene that requires people to wash their hands instead of using an alcohol based hand sanitizer.

In this study the purpose was to explore how nurse's days were affected and to what degree they were affected by being assigned a patient that has been diagnosed with *C. diff*. There were six nurses from the U.S. and six nurses from France that participated in the study. Many were from nursing homes and from critical care units based in hospitals. The data that was collected from the nurses was collected through interviews.

In summarizing the results of this study, the main concerns of the nurse were the protocols that were to be followed and the amount of diarrhea that people who have been diagnosed with *C. diff* exhibit. Another issue that came up during this study was the problem of the financial burden that the facility faces when treating patients with *C. diff*. The nurses that were interviewed in this study stated that the management of *C. diff* patients was particularly cumbersome because of the fact that they had to be so careful with their procedure in putting on PPE and had to do this every time they entered the patient's room. Another negative aspect was that they had to keep an eye on visitors to make sure that they were following correct PPE protocol. That being said, nurses who were on floors where the patients were isolated to a room by themselves made using PPE a less difficult task.

Through analyzing a study done by David P. Durham, et al, on the transmission of

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*C. diff* within and outside of healthcare facilities it was found that even though patients that were symptomatic, and were put under correct isolation protocols, were still transmitting the infection to patients that were not infected at a higher rate than patients that were asymptomatic carriers. There is still a strong need for education for everyone coming into contact with a person who is infected and is symptomatic on the proper use of PPE and isolation control. That being said, the good news is that the rate of transmission from person to person in asymptomatic carriers is lower within the community and outside of the hospital setting. Improvements that could be made are education of staff on PPE and hand hygiene, specifically stating that in cases of *C. diff*, the staff must wash their hands with soap and water before and after encountering the patient.

A study done by Richard E. Nelson, et al, was the first study done on the cost effectiveness of treating *C. diff* after it has been acquired versus using bundle interventions to prevent the transmission of the infection. The bundle intervention that was introduced in this study was one that included aggressive *C. diff* testing, empiric isolation and treatment of symptomatic patients, improved adherence to hand hygiene and contact precautions, improved use of soap and water for hand hygiene, and improved environmental cleaning.

When conducting the study it was assumed that an increase in interventions would also lead to an increase in the use of hand hygiene with soap and water by all healthcare staff after coming into contact with a patient who has been infected for is suspected to be infected. As for the effectiveness of these infection control interventions, it was found that their effectiveness could be dependent on the other epidemiological condition that were present within the facility at that time.

To interpret the results of this study, it was found that when there was an increase in interventions to prevent the spread of *C. diff* from patient to patient, there was a decrease in

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transmission rates in the facility. While it is not clear what part of the intervention “bundle” was most effective, we can use this information to form the conclusion that all parts of the bundle were equally important in preventing transmission. This includes the use of PPE by healthcare staff. As for the cost effectiveness of implementing interventions to decrease the transmission of infection it was found that it is less costly for a facility to use PPE and implement hand washing with soap and water than it is for them to treat *C. diff* after it has been contracted.

After researching the literature I have found that there is no need to change the policy at Baptist Health Paducah on the use of PPE in infection control of *Clostridium difficile*. They are up to date on when and where they should be wearing PPE when a patient comes in with symptomatic or asymptomatic *C. diff*. Their vigilant use of contact precautions is most cost effective for the facility in preventing the transmission of infection. Their use of signs displaying what to put on and how to put on PPE on each patient’s door that is infected with *C. diff* proves their commitment to education and enforcement of these infection control protocols.

In summary, the education of healthcare staff at this time is sufficient to stop the spread of *C. diff* infection. There are no further changes that need to be made to the policy that the Baptist Health facility has already set forth. The literature that I have found supports what they are doing in their facility and that they should keep progressing along these lines.

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