Hand Hygiene as a Preventative Measure Against the Spread of CA-MRSA in the Acute Care Setting

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This paper was written for Dr. Sauter's Nursing Research Class

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Abstract

Posters were hung in the Emergency Department of a large Metro-Atlanta hospital to be viewed by each care team and were discussed with nurses. The posters included an emphasis on hand hygiene and other infection control practices, pictures of MRSA infected lesions, and the phone number of the infection control department. The evaluation of the project was a follow-up observation of hand hygiene behaviors, and discussion with the nursing staff regarding the effectiveness of the posters. The visual trigger of the posters did help to remind nurses to practice hand hygiene more frequently. During the follow-up observation the nursing staff washed their hands or used the hand sanitizer with increases frequency.

Statement of Purpose

This study has examined the effects of visual aids for improved infection control compliance among nurses, specifically regarding CA-MRSA. The findings can be used to better educate health care workers, particularly nurses, about the benefits of using universal precautions, with a focus on hand hygiene, to prevent the spread of CA-MRSA.

Literature Review

More recently, MRSA infections have been described in patients with no recognized risk factors who are living in the community (Fridkin et al., 2005). Researchers from the Centers for Disease Control found that the annual incidence in 2003-2004 of CA-MRSA disease in Atlanta was 25.7 per 100,000 (Fridkin et al., 2005). Improved compliance with infection control practices, specifically hand hygiene, will help with preventing and controlling the transmission of infections.

*Staphylococcus aureus* organisms (generally called “staph”) are gram-positive bacteria “commonly carried on the skin or in the noses of healthy people” (Centers for Disease Control, 2005). Staph is one of the most common causes of skin infections in the United States and although some of these infections are minor, others require antibiotics to be treated (Centers for Disease Control, 2005). Some manifestations of infections caused by *S. aureus* are “superficial infections, pustules, boils, carbuncles, abscesses, impetigo, conjunctivitis, and wound infections” (Banning, 2005, p. 548). Since the beginning of widespread use of antibiotics in the 1940s many bacteria have developed resistance to antibiotic agents such as penicillin, as well as some other classes of antibiotics (Winter, 2005). A strain of the *S. aureus* bacteria that is unresponsive to treatment with the antibiotic agent methicillin is known as *Methicillin Resistant Staphylococcus aureus* (MRSA). Historically, MRSA has been a common nosocomial (hospital acquired) infection. However, since the 1980’s and 1990’s, there has been evidence of the emergence of community acquired MRSA (CA-MRSA). “Owing to its ability to mutate, several clones and groups and subgroups have emerged that add to the
difficulties of treating this bacterium” (Banning, 2005, p. 554). MRSA is a growing threat to health worldwide.

The Centers for Disease Control (2005) has found clusters of CA-MRSA skin infections among athletes, military recruits, children, Pacific Islanders, Alaskan Natives, Native Americans, men who have sex with men, and prisoners. Nurses should focus on reducing the spread of MRSA, by infection control practices, and actively educate patient’s regarding the spread of infection. “Nurses should be encouraged to wash their hands between patients to prevent the spread of infection” (Banning, 2005, p. 554). Hand hygiene is an easy and cost effective way to prevent the spread of infection.

Nurses can take an active leadership role by “implementing infection control measures to protect patients, visitors, and other healthcare workers from the spread of MRSA” (Ott, Shen, & Sherwood, 2005, p. 371). CA-MRSA is a bacterium that has become a major challenge to all healthcare workers. It is the responsibility of all nurses to prevent and control the spread of this infection. Changing individual behaviors requires multidimensional interventions. Reaching all healthcare workers as well as the community at large with the information needed to practice universal precautions is an ongoing effort. Getting everyone to improve infection control practices could be the first step in conquering the spread of CA-MRSA.

Theoretical Background

The theoretical framework for this study is based on Lippitt’s seven step process. The process focuses on the tasks of the change agent (Sullivan and Decker, 2005). The first step in this process was to diagnose the problem. There is an increased number of patients with CA-MRSA being cared for, with suboptimal healthcare worker compliance with basic infection control practices. The second step was to assess the motivation and capacity for change. While there is always some resistance to any change, health care workers are capable of and adaptable to change in their environment. The third step was to assess the change agent’s motivation and resources. Motivation on behalf of the researchers will increase compliance with infection control. The fourth step was to select progressive change objectives. The change agent developed a plan, strategy, and methods, and has identified the evaluation criteria. The fifth step was to choose a change role agent. The researchers acted as motivators to promote support for this project from the staff. The sixth step was to maintain the change. The researchers communicated with the staff regarding the information presented and its perceived effectiveness. The seventh step was to terminate the helping relationship. Upon termination, the researchers withdrew from the role of the change agent.

In order to make a change, it is necessary for the teacher to be competent to teach and the learner to be receptive to learning. Knowles’ theory is an appropriate learning theory to incorporate due to its focus on adult learning principles. Knowles identified seven principles of adult learning (Lewis, Heitkemper, & Dirkson, 2004). In developing a strategy to inform the healthcare worker, three principles are identified as pertinent. One principle is that adults are independent learners; they are self-motivated, self-directed, and self-evaluated. Therefore, providing visual stimuli allows the adult learners to independently read and process the information. Another principle is that adults learn best when the topic is of immediate value. The high incidence of patients with CA-MRSA has highlighted the importance of this information to the nurses in the Emergency
Department. The last principle applicable to the plan is that adults approach learning as problem solving, and therefore teaching must target a specific problem. For this reason, when CA-MRSA was identified as a problem, the nurse was motivated to work towards the solution.

**Ethical Considerations**

For the purpose of this study, every effort was taken to ensure patient confidentiality as well as the researchers’ adherence to ethical standards. Since the study group is the nursing staff and their observed level of compliance with hand hygiene, minimal patient information was observed or shared. The Emergency Department head granted permission for this observation and the nursing staff was informed of the observation. Permission to conduct the study was obtained from the IRB of this facility. Furthermore, no information regarding the identity of the nurses observed was recorded or shared.

Information obtained is in the form of tallies of observed actions. This information was recorded for the purpose of the study and maintained in a locked file for viewing by the members of the research group, instructor, and department head of the facility upon completion and compilation. Following data analysis, records gathered were destroyed by shredding. All patient safety care practices were adhered to. If at any time the observation became interference to the staff as in a time of crisis or high patient acuity, the observers would terminate until conditions were favorable for further observation.

**Research Questions**

- Do nurses practice hand hygiene often enough to prevent the spread of nosocomial infections, specifically CA-MRSA?
- What level of impact would compliance in hand hygiene have on the reduction of the spread of nosocomial infections, specifically CA-MRSA?
- Are nurses compliant and consistent in their hand hygiene so as to reduce the spread of infection?
- Will visual aids and education for nurses encourage compliance and increase occurrence of hand hygiene in this setting? Will this increase the level of proper hand hygiene in order to produce a reduction in the spread of nosocomial infections, specifically CA-MRSA?

**Setting**

This study took place in a 26 bed, Emergency Department in a large Metropolitan Medical Center in Atlanta, Georgia. The department is not a trauma center but is designated as a stroke center. The department sees between 70 and 105 patients a day either through its main emergency department designation or through the lower acuity fast-track area. The department is served by a rotating physician staff that consists of one to three physicians, and eight to ten nurses, mostly RN’s with sometimes two LPN’s, and support staff, technicians, and secretaries. For the purpose of the study, the nursing staff (RN’s and LPN’s) was the observed group.

**Study Design**
A quantitative, descriptive design was used in this study. This design method was chosen in order to permit the researchers to conduct the study in a natural setting without any form of manipulation. The aim of the study was to observe and record the phenomenon firsthand as it was occurring in the emergency department. All of the subjects participating in the study were obtained by utilizing a non-probability convenience sampling approach. The inclusion criteria required that in order to participate in the study the subjects were licensed nurses, either licensed practical nurses (LPNs) or registered nurses (RNs).

**Sampling Procedure and Characteristics**

A convenience sample was used in this study. To be included in this study the participants had be either LPN’s or RN’s. They must have given direct patient care, and be working in the emergency room on the days that the researchers were present. A group of eight to ten nurses on one of four shifts comprised the sample group totaling a maximum of forty-eight observed participants and a minimum of thirty-two. Thirty two participants were needed to validate the study. Forty-eight was the maximum of potential participants that were recruited.

**Data Collection and Strategies**

The data was collected through observation of hand hygiene behaviors and discussion with nursing staff of the Emergency Department regarding effectiveness of the posters. The data collectors consisted of three LaGrange College student nurses and one additional data collector that were stationed at one of four care areas within the emergency department. The observation experience took place on four occasions lasting four hours each during a two month span. Researchers were on the unit as observers and were identified as “nursing students doing clinical observation,” so as not to interfere with the results of the study. The researchers were observing the hand hygiene practices of the nurses. Specifically, if the utilized the foam or traditional hand washing at the beginning and end of each patient encounter.

**Data Storage, Retrieval, and Analysis**

The data collected during the study was organized according to the day and the shift in which the data was collected. Each specific observed phenomenon was then further organized into the appropriate category. Results were recorded on a “tally sheet” provided to each observer for their area. Throughout the study, all of this data was stored in a fire-proof safe at the home of one of the researchers. This was done in order to safeguard the data as well as to protect the confidentiality of the subjects involved in the study. After the study was completed, any data that was of a confidential nature was shredded.

Once all of the data was collected, it was then compiled so that all behaviors and events could be appropriately categorized. The frequency of the observed phenomenon was then recorded in the appropriate category. The categories included either “practiced hand hygiene” or “did not practice hand hygiene” upon completion of patient contact or care. The significance of the emerging data was analyzed and the results were documented. A narrative of the results documents the findings of the study. The use of visual aids to represent the rate at which the phenomenon occurred, such as, tables and graphs were also used.
PRE-EDUCATION

POST-EDUCATION

Findings

The nurses in this study were conscientious about their use of gloves, gowns, and masks, but their compliance with handwashing was not as good. The researchers conducted an observation of infection control practices, specifically focused on handwashing behaviors. The researchers observed the nurses going in and out of rooms approximately 909 times, and only observed handwashing or use of antibacterial hand sanitizer on 556 occasions. This demonstrates a rate of 61% of nurses performing hand hygiene. The researchers noted during the observation that the nurses may not have touched anything on every visit to a room, however it is improbable. It was also noted that the Emergency Department is a fast paced environment. Especially in areas like triage, patients come through so fast that disinfection of equipment that is used on all patients rarely occurs, and disinfection of the chair and desk occur even less. It is possible that nurses who have been in practice for many years may become complacent and at times may be less diligent about following established infection control guidelines. The researchers will utilize their strengths of strong written and verbal skills, as well as their high level of energy and motivation to aid in the implementation of this plan.

While most of the information provided to staff focused on reducing the spread of MRSA in the Emergency Department, emphasis was also placed on educating patients...
Hand Hygiene as a Preventative Measure regarding the spread of infection. In order to evaluate the effectiveness of the project, the researchers conducted a follow-up observation of handwashing behaviors, and engaged in discussion with the nursing staff of this Emergency Department regarding the effectiveness of the posters. In order for this change project to be deemed effective, the researchers observed the same care team for the same amount of time. Ideally handwashing would occur one hundred percent of the time, but for the purpose of observing improvement the nursing staff will have washed their hands or used the alcohol hand sanitizer at least eighty percent of the time. Prior to hand hygiene education the compliance rate was only 61.7%. Post education the rate increased to 88.3%. The increase was 27.2%. This data is based upon the direct observations and recordings of the researchers.

**Conclusion**

In conclusion, the researchers have taken a step towards constructive action that can potentially effect positive change in an established environment. “Nurses also can take leadership roles in implementing infection control measures to protect patients, visitors, and other healthcare workers from the spread of MRSA” (Ött, Shen, & Sherwood, 2005, p. 371). CA-MRSA is a bacterium that has become a major challenge to all healthcare workers. It is the responsibility of all nurses to prevent and control the spread of this infection. Changing individual behaviors requires multidimensional interventions. As evidenced by the findings, the intervention of usage of visual aids was very effective in promoting an increase in hand hygiene. Reaching all healthcare workers as well as the community at large with the information needed to practice universal precautions is an ongoing effort. Getting everyone to improve infection control practices could be the first step in conquering the spread of CA-MRSA.

The plan was focused on improving compliance with infection control. Handwashing is the foundation of infection control. It is the most important and the most basic technique in preventing and controlling transmission of infections. In nursing school handwashing is heavily emphasized, classes are devoted to proper handwashing techniques, and instructors remind students to wash their hands multiple times in a clinical day. “Nurses should be encouraged to wash their hands between patients to prevent the spread of infection” (Banning, 2005, p. 554). Handwashing is an easy and cost-effective way to prevent infection, but it is not the only factor to consider.

Other methods of infection control include gloving, masking, gowned, device handling, and laundry handling (Centers for Disease Control, 2004). Gloves should be applied immediately prior to the physical exam of the patient, and removed promptly thereafter. Masking and gowned are infection control methods designed to protect the healthcare worker and should not be ignored. Always decontaminate reusable equipment between patients and discard single use items. “Decontamination is a process intended to make the environment and equipment safe for their intended purposes” (Gould, 2004, p. 40). Careful handling of bed linens is important, linens should not touch the skin, mucous membranes or clothing of the person handling them. “Universal precautions should be enforced when nursing patients who have MRSA infections” (Banning, 2005, p. 554).

Patient education is another part of infection control. Nurses are the part of the healthcare team who are responsible for providing patient education. The consequences of an MRSA infection to patients “include pain, discomfort, distress, and risk of death”
(Ott, Shen, & Sherwood, 2005, p. 361). Teaching patients and their family members about the methods of transmission of infections is imperative. Myatt & Langley (2003) conducted a study regarding change in infection control practices that found that education of patients colonized with MRSA was a priority. “Leaflets were available about their infection and hospital stay, and a specific discharge advice leaflet was also devised” (Myatt & Langley, 2003, p. 677). Although this facility provides pamphlets about MRSA, emphasis in patient teaching should be placed on frequent handwashing, instructions to avoid touching lesions, to keep dressings clean and dry, frequent washing of bedding/linens, no sharing of personal items like towels, razors, etc., and disinfection of shared athletic equipment.

References


