MULTIPRONGED APPROACH TO IMPROVE HAND HYGIENE IN ACUTE CARE

NURSES

by

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Abstract

Purpose: This article outlines a quality improvement project to implement a multipronged approach for improvement of hand hygiene (HH) adherence during bedside patient care in an inpatient acute care setting.

Design: A pretest/posttest design was utilized. The project involved a pediatric acute inpatient unit at a community hospital located in the Northeast between March and May 2016. The sample included ten registered nurses. The Iowa Model provided a theoretical basis for the project.

Methods: Data collection occurred in three separate modes. Mode 1 focused on determining if knowledge, attitudes, and barriers to infection control from nursing staff changed post intervention using paired t-test analysis. Mode 2 focused on determining if product use changed following participation in the HH initiative. Mode 3 focused on covert peer HH observations.

Findings: Data showed knowledge, attitudes, and product use did not change significantly following participation in the HH initiative. Peer observation data showed that unit HH compliance increased by 2% in clean in, and increased by 8.3% in clean out during the pilot period.

Conclusions: The quality improvement project resulted in an improvement in overall unit HH compliance. Targeted education on HH, periodic assessment, and feedback on healthcare worker adherence to recommended HH practices should be continued.

Clinical Relevance: Hand hygiene is a necessary and mandatory standard of care to protect both patients and health care workers from infection, yet HH compliance rates are low and guidelines are not consistently followed. Instituting a multipronged approach to HH is one strategy that can be implemented across all practice settings to improve adherence to practice guidelines.

Keywords: Multimodal approach, hand hygiene, quality improvement, peer observation

Multipronged Approach to Improve Hand Hygiene in Acute Care Nurses

Health care associated infections (HAIs) are defined as infections acquired while a patient receives treatment in a health care setting for unrelated medical or surgical conditions (Landers et al., 2010). HAIs can occur in any type of health care setting and are among the leading causes of preventable death in the US (Healthy People, 2014). One in every twenty-five inpatient has an infection related to care they received in a hospital setting (Office of Disease Prevention and Health Promotion, 2014). Over a million HAIs occur across the U.S. health care system every year, leading to the loss of tens of thousands of lives and adding billions of dollars to health care costs (Landers et al., 2010). HAIs are the fifth leading cause of death in acute care settings (Septimus, et al., 2014). There are approximately 1.7 million HAIs and 99,000 deaths annually (Septimus et al., 2014). It is estimated that 20% of HAIs are preventable (Aziz, 2014).

Infection was once considered a possible consequence of hospitalization and is now viewed as an unacceptable outcome that significantly impacts patient outcomes (Siegel, Rhinehart, Jackson, Chiarello, & the Healthcare Infection Control Practices Advisory Committee, 2007). Reducing HAIs directly benefits patients through decreased length of stays, decreased morbidity and mortality, and improved quality of care (Siegel et al., 2007). Infection control practices in the health care setting are a necessary and mandatory standard of care to protect both patients and healthcare workers (HCW) from infection. Much time and energy is spent educating HCWs about infection control, yet compliance rates are low and guidelines are not consistently followed (Aziz, 2014; World Health Organization [WHO], 2009a). The purpose of this paper is to outline a quality improvement project to implement a multipronged approach for improvement of hand hygiene (HH) adherence during bedside patient care in an inpatient acute care setting.

Literature Review

The purpose of routine hand washing in patient care is to remove dirt, organic material, and microbial contamination acquired by contact with patients or the environment (WHO, 2009a). HH includes both hand washing with soap and water and use of alcohol-based products that do not require water (WHO, 2009a). HH is the single most important practice to reduce the transmission of infectious agents in health care settings and is an essential element of standard precautions (Siegel et al., 2007).

The WHO's Five Moments for HH (WHO, 2009a) are listed in multiple expert opinion pieces as a foundation for measuring HH compliance through observation. The Five Moments for HH include before touching a patient, before a clean or aseptic procedure, after body fluid exposure risk, after touching a patient, and after touching the patient surroundings (Eiamsitrakoon, Apisarnthanarak, Nuallaong, Khawcharoenporn, & Mundy, 2013). Two studies observed all five moments for HH and found the greatest compliance came with the first and last moment of HH (Cumbler et al., 2013; Eiamsitrakoon et al., 2011). Yin et al. (2014) also used the Five Moments for HH, but focused observations only on the first and last moments as HCWs entered and exited the patient's room. Although the Five Moments for HH were not mentioned, Kowitt, Jefferson, and Mermel (2013) based observations on entering and exiting the room as well. Chau, Thompson, Twinn, Lee, and Pang (2011) also conducted observational studies to identify omissions of HH during all aspects of patient care.

Adherence to recommended infection control guidelines decreases transmission of infection in health care settings. However, HCWs adhere to recommended HH procedures with rates ranging from 5% to 89%, representing an overall average of 38.7% (WHO, 2009a). Despite knowledge of infection control policies and benefits of use, compliance rates remain low (Jain, Dogra, Mishra, Thakur, & Loomba, 2013). Nurses are unaware of the discrepancy

between their own practice and the guidelines (Jackson, Lowton, & Griffiths, 2014). Nurses lack

self-awareness and insight that they are putting themselves and others at risk for infection by not

following policy and procedure surrounding infection control (Eiamsitrakoon et al, 2013;

Jackson et al., 2014).

Ellingson et al. (2014) recommends using a bundled, multipronged approach for

improving compliance with infection control practices. Ellis (2012) and Rosenthal et al. (2013)

both recommended a multipronged approach to HH initiatives. Another common theme in

research is the positive correlation of frequent feedback on HH compliance data and improved

HH compliance. Harne-Britner, Allen, and Fowler (2011) and Rosenthal et al. (2013) both

shared monthly HH reports with the HCWs involved in the studies through monthly meetings on

the involved units.

Multiple researchers looked at the knowledge of HCWs on HH and infection control

practices to prevent HAIs and found that education improved HH compliance (Ellis, 2012;

Fitzpatrick et al., 2011; Freeman, 2011; Harne-Britner et al., 2011). Research suggests HH

education reinforcement on regular bases will improve HH compliance (Chau et al., 2011;

Salaripour & Perl, 2013). Research shows that although teaching is one of the best ways to

educate nurses on infection control practices, this knowledge does not always translate into

practice (Ward, 2012).

Wyeth (2013) states that the biggest issues surrounding compliance with infection control

measures are changing attitudes and behaviors. Multiple studies involved collecting data on

knowledge, attitudes, and beliefs surrounding HH and HAI. Tan and Olivo (2015) utilized the

WHO perception survey, the survey utilized in this quality improvement project. Multiple

studies assessed knowledge, attitudes, and beliefs, but did not indicate what tool was utilized to

collect data (Efstathiou, Papastavrou, Raftopoulos, & Merkouris, 2011; Salaripour & Perl, 2013;

Tenna et al., 2013). Most of these studies reported that knowledge did not translate into practice (Salaripour & Perl, 2013; Tan & Olivio, 2015; Tenna et al., 2013).

Theoretical Framework

When contemplating a practice change, it is important to consider the application of a theoretical framework or model to facilitate the implementation of research into practice (Schaffer, Sandau, & Diedrick, 2012). Evidence based practice models can help simplify complex problems encountered during implementation of evidence into practice and alleviate some of the challenges nurse leaders face (Schaffer et al., 2012). The Iowa Model is a theoretical framework that assists nurse leaders in identifying, developing, implementing, and evaluating evidence based practice changes surrounding HH as a means of infection control.

The Iowa Model is a multistep process for incorporating evidence-based practice into clinical decision-making (Dang et al., 2015). The first step of the Iowa Model is to identify practice questions based on clinical problems or new knowledge (Dang et al., 2015). Other steps include identifying if the issue is of concern to the organization so that priorities can be established, forming a team to address the issue, determining if sufficient research surrounding the issue exists, analyzing existing evidence, and develop and implement a pilot program (Dang et al., 2015). The final step is to evaluate the practice change and disseminate the results (Dang et al., 2015). It is important to note that some authors report a seven-step model, while others utilize a six-step model where design and implementation of the pilot project are combined into one step. According to Dang et al. (2015), the Iowa Model has been used successfully to identify issues and change practice to promote quality care with regard to regulatory and reimbursement changes. The Iowa Model is an ideal choice for a project involving peer evaluation since it is an evidence based practice change involving a pilot program (Dang et al., 2015).

Methods

The purpose of this quality improvement pilot project was to improve infection control through HH adherence during bedside patient care. One overall PICOT question was formulated for this quality improvement project: "Does a multipronged HH initiative impact adherence rates to proper implementation and use of HH for infection control of registered nurses in acute care settings over a two-month period?" The pilot program included aspects of education, training, surveys, observations, and sharing data with unit staff over a two month period in a pediatric medical surgical acute inpatient unit at a community hospital located in the Northeast. Figure 1 outlines the multipronged approach utilized for this project. A pretest/posttest design was chosen to measure knowledge, attitudes, and beliefs about the HH intervention.

Data Collection Process

Following IRB review and approval, data were collected using a multipronged approach. Data collection occurred in three separate modes. Mode 1 focused on determining the knowledge, attitudes, and barriers to infection control from nursing staff within the acute care unit and if these changed following participation in the HH initiative. Mode 2 focused on determining if product use changed following participation in the HH initiative. Lastly, Mode 3 focused on peer observations of the implementation of infection control practices.

Mode 1: Knowledge, attitudes, and beliefs survey. The project manager began this mode by asking nurses in the pilot unit to complete a survey on their knowledge, attitudes, and beliefs on HH practices, particularly with regard to HH. An email containing a link to the Survey Monkey site for the project was sent to all nurses employed in the pilot unit. The nurses were asked to complete the survey, data were analyzed, and results were used as the guide to design the education program on the HH initiative. Within two weeks of administering the baseline survey, the project manager provided educational sessions on the HH initiative with all

nurses on the unit. The importance of HH was reinforced verbally during shift huddles and

visually using posters in the report room. Six weeks after the session, the project manager sent

out another email to the nurses on the pilot unit requesting them to complete the follow up

survey. This served as the posttest data for the project and was used to determine whether there

were changes in the nurses' knowledge, attitudes, and barriers to infection control after

undergoing the HH initiative.

To preserve participant confidentiality, the project manager assigned a random

identification number to each nurse. The email about the survey provided nurses with their

individual identification numbers. Nurses were instructed to input this number at both instances

of data collection (pretest and posttest) to facilitate the matching of pretest and posttest data for

comparison. Aside from the random identification number, no names, or any form of

identification were collected from the nurses.

Mode 2: Product use. To collect data on product use, the project manager collaborated

with the central purchasing unit of the hospital. The analysis of product use included both hand

rub and soap used on the pilot unit. Data were collected prior to the implementation of the HH

initiative as the baseline or pretest data. Two months after the start of the HH initiative, the

project manager once again collected data from the central purchasing unit regarding the

consumption of hand rub and soap for the pilot unit.

Mode 3: Implementation of infection control practices. To collect data on the

implementation of infection control practices, the project manager implemented peer evaluation

over a two-month period on the three shifts of the hospital (day shift, evening shift, and night

shift). The project manager asked for volunteers who expressed interest in being peer auditors of

HH practices. Recruitment methods were utilized to ensure that there was equal representation

from all shifts. The project manager trained peer observers on all shifts to secretly observe the

HH practices of all disciplines on the unit as they entered (clean in) and exited (clean out) patient

rooms. Peer auditor training occurred over a two-week period and included training nurses on

the peer evaluation process and audit tool. Peer evaluation occurred over a two-month period for

all shifts after peer observer training was complete. Observation data were analyzed at the one-

month and two-month mark. The project manager analyzed the monthly HH observation data

gathered by peer observers and shared the data with nurses on the unit at monthly staff meetings.

The project manager also met with the peer observers to gather informal feedback on the audit

tool and answered any questions that the observers may have had. In addition, baseline/pretest

and posttest infection rates were obtained from the Infection Control Department of the hospital

as part of the data analysis.

Instruments

Mode 1: Knowledge, attitudes, and beliefs toward HH. To measure the nurses'

knowledge, attitudes, and beliefs toward HH, the project manager utilized the Perception Survey

for Health Care Workers and the HH Knowledge Questionnaire for Health Care Workers. These

two instruments were adapted from the WHO Guidelines on HH in Healthcare (2009a). The

Perception Survey was used to measure healthcare workers' opinion on healthcare-associated

infections and HH. Likewise, the HH Knowledge Questionnaire was used to measure healthcare

workers' knowledge on HH. The twenty-four question baseline survey assessed formal HH

training, routine use of alcohol based hand rub, the average percentage who will develop

infection, the impact of HAI on clinical outcome, effectiveness of HH, importance of HH to the

institution, average in hospital who perform HH, how effective actions would be to reduce

infection, routes and prevention of cross transmission, true/false statements about HH, situations

for HH, and HH actions to be avoided. For the posttest, eight additional items were included to

determine the participants' opinion of the strategies and tools their institution provided them to promote HH. These instruments were administered electronically.

Mode 2: Soap and hand rub consumption survey. This instrument measured the consumption of products, such as soap or alcohol-based hand rubs that were used in HH improvement strategies. The measurement of these products was an alternate method to monitor HH performance. Only data on the consumption of the inpatient pediatric medical surgical floor for both soap and alcohol-based hand rubs was included in this project.

Mode 3: Peer observation form. To monitor HH practices of pilot unit staff, the project manager and peer observers used the Peer Observation Form. The form was used to collect data on positive HH actions (hand washing or using hand rubs) or negative HH actions (missed hand rubs or hand washing) of nurses, licensed nursing assistants, environmental services (ENV), students, medical doctors (MD), respiratory therapists, and nurse practitioners/physician assistants. Using this form, peer auditors collected data on HH actions of peers as they entered (clean in) and exited (clean out) the patient room. All disciplines on the pilot unit were observed to gain insight on overall unit compliance to HH guidelines.

The WHO has the most extensively referenced and comprehensive guidelines for HH available to date (WHO, 2009a). It should be noted that while the instruments used in this project have been extensively used in other studies, actual validity and reliability statistics for these WHO tools have yet to be determined. The tools were constructed based on expert consensus, but the validation process for these tools was not clearly described in the literature. Thus, the psychometric properties of the instruments used in this project remained undetermined (the Joint Commission [TJC], 2009; WHO, 2009a).

Findings and Discussion

According to TJC (2009), the three main methods of measuring infection control through HH performance are direct observations, measuring product use, and surveying nursing staff. Covert direct observation of HH practice is the gold standard for measuring compliance in acute care settings (Ellingson et al., 2014; Yin et al., 2014). Direct observation does not allow individual nurses' knowledge, attitudes, and beliefs surrounding infection control practices to be assessed (Williams & Carnahan, 2013). Hence, a questionnaire to collect specific data about nurses' knowledge, attitudes, and beliefs surrounding HH practices was utilized in conjunction with the direct peer observations. Using more than one method of data collection is more likely to yield reliable results than using a single data collection method (TJC, 2009).

Mode 1 – Knowledge, attitudes, and beliefs survey. To determine if there was a significant difference in responses after the HH initiative, paired *t*-tests were used for survey questions with continuous responses, and McNemar's Test of Association was used for categorical responses. This project contained survey responses for 10 registered nurses employed on the pilot unit. All off these 10 registered nurses were female (100%, $n = 10$). Demographic information on participants is located in Table 1.

The Knowledge, Attitudes, and Beliefs Survey did not have significantly different responses from the baseline. Only two knowledge areas changed from baseline. The first area (question 3) involved the percentage of hospitalized patients who develop a health care-associated infection increased from 26.2% ($SD = 19.7$) to 41.1% ($SD = 27.8$). Results of the statistical test showed that the average percentage at post was significantly higher than baseline ($Z = -2.31$, $p = 0.021$). The second area (question 21) involved the knowledge that unclean hands are the main source of cross-transmission (70%, $n = 7$) to (100%, $n = 10$).

Mode 2 – Product use. To observe product use, data were collected from the central purchasing unit regarding the consumption of hand rub and soap for the pilot unit. Data were collected prior to the implementation of the HH initiative as the baseline or pretest data. Two months after the HH initiative, the researcher once again collected this data (posttest). Data showed that the central purchasing placed orders for HH products monthly and that no change in product consumption was noted.

Mode 3 – Implementation of infection control practices. To explore multidisciplinary implementation of Infection Control Practices, a Peer Observation Form was used. Peer Observation data are located in Table 2. When observing Registered Nurses (RNs), there was a 14% increase in clean in, and a 5.1% increase in clean out. For Licensed Nursing Assistants, there was a 2.5% increase in clean in, and a 64.7% increase in clean out. The March/April numbers stayed at 100% for ENVs and Students. There was a 30% decrease in clean in seen in MDs, along with a 16.7% decrease in clean out. For Respiratory Therapists and Nurse Practitioner/Physician Assistants, there were no baseline numbers to compare. When comparing baseline to May, for RNs, there was a 9.3% increase in clean in, and a 0.6% increase in clean out. For Licensed Nursing Assistants, there was a 14.3% decrease in clean in, and a 54.7% increase in clean out. The March/April numbers stayed at 100% for ENVs and Students. There was a 35% decrease in clean in seen in MDs, along with a 16.7% increase in clean out. For Respiratory Therapists and Nurse Practitioner/Physician Assistants, there were no baseline numbers for comparison. Observations were limited to the disciplines present on the unit at the time observations were conducted.

An overall compliance rate was calculated for observed HH amongst all disciplines. In March, over all disciplines, the clean in compliance rate was 76.2% ($n = 42$), and the clean out compliance rate was 72.3% ($n = 47$). In April, over all disciplines, the clean in compliance rate

was 84.7% ($n = 98$), and the clean out compliance rate was 85.2% ($n = 88$). This corresponds to

an 8.2% increase in clean in, and 12.9% increase in clean out, from March to April. In May,

over all disciplines, the clean in compliance rate was 78.2% ($n = 101$), and the clean out

compliance rate was 80.6% ($n = 72$). This corresponds to a 2% increase in clean in, and 8.3%

increase in clean out, from March to May.

In addition to peer observation, HAI rates on the unit were measured at baseline and

during the pilot period. The Infection Control Department did not report any HAI prior to or

during the pilot period for the pilot unit. Therefore, there was no improvement in the infection

rate during the pilot project.

Limitations

There were several limitations to this quality improvement project. Firstly, the project

occurred on a pilot inpatient unit with a small sample size of only ten registered nurses. Results

may not be generalizable to other geographic areas or practice settings. The second limitation of

this project is the use of peer auditors to collect data. The project manager was not present for all

peer observations. To reduce observer bias, all peer auditors were trained to observe practice in

a neutral and non-judgmental manner and practice sessions were offered to the peer auditors

before the data collection occurred in the hospital. Despite the training provided to the peer

auditors, the possibility of human error could affect the validity and reliability of the data

collected. Third, the scope of the project only included one unit within a large hospital. It is

suggested that the project be replicated on a hospital-wide basis to lend support to the findings of

the quality improvement project. Fourth, as stated earlier, the reliability and validity of the

WHO tools used for the project are not clearly documented. Lastly, the collection of data on

product use was limited only to the amount of products consumed within the period of the pilot

project. The number of patients served during this time was not included in the analysis.

Implication for Nursing Practice and Research

Despite worldwide attention and widespread efforts towards improved infection prevention, risk of infection is still an issue in health care. The challenge of overcoming poor compliance rates for infection control revolves around fully understanding the barriers nurses have to following the existing HH guidelines. Understanding the barriers to HH guideline adherence can be simplified by incorporating multipronged training and audit packages into quality improvement efforts. Health care organizations must constantly seek ways to engage staff to improve compliance with infection control measures (Wyeth, 2013). Involving nurses in the audit process will increase buy in and a sense of ownership in the success of the project. In addition, this project utilized monthly unit staff meetings as a means to distribute data obtained from surveys on the knowledge, beliefs, and attitude towards HH guidelines as well as peer observation audits.

The quality improvement project resulted in an improvement in overall unit HH compliance. However, there were no significant changes in knowledge, attitudes, or beliefs; product consumption use; or infection rates for the pilot unit. Although formal HH education was aimed at nurses, all disciplines were present during in-services and could view educational posters and HH data posted in the report areas. Data supported the use of a multipronged approach for improvement with adherence to infection control guidelines, therefore aspects of the project will be utilized during the hospital-wide initiative. Continued examination on HH throughout the hospital-wide initiative will bring administrators one-step closer to fully understanding the barriers to following the existing infection control guidelines.

Conclusions

The pilot project included aspects of education, training, surveys, and observations. The tools used in this project were based on the "WHO Guidelines on HH in Healthcare" (WHO,

2009a) and included staff surveys on attitudes, beliefs, and knowledge on HH; evaluation tools;

and resources for statistical analysis (TJC, 2009; WHO, 2009b). The WHO toolkit includes all

of the essential pieces for completion of the project in a multipronged bundle. Using a

multipronged, bundled approach to HH is one strategy that can be implemented across all

practice settings to improve adherence to practice guidelines. Healthcare organizations may find

a multimodal approach useful to improve HH compliance and improve patient outcomes.

References

Aziz, A. (2014). Hand hygiene compliance for patient safety. *British Journal of Healthcare*

    Management, 20(9), 428-34. doi: 10.12968/bjhc.2014.20.9.428

Chau, J. P., Thompson, D. R., Twinn, S., Lee, D. T., & Pang, S. W. (2011). An evaluation of

    hospital hand hygiene practice and glove use in Hong Kong. *Journal of Clinical Nursing,*

    20(9/10), 1319-28. doi: 10.1111/j.1365-2702.2010.03586.x

Cumbler, E., Castillo, L., Satorie, L., Ford, D., Hagman, J., Hodge, T., …Wald, H. (2013).

    Culture change in infection control: Applying psychological principles to improve hand

    hygiene. *Journal of Nursing Care Quality, 28*(4), 304-11. doi:

    10.1097/NCQ.0b013e31829786be

Dang, D., Melnyk, B. M., Fineout-Overholt, E., Ciliska, D., DiCenso, A., Cullen, L., …Stevens,

    K. R. (2015). Models to guide implementation and sustainability of evidence-based

    practice. In B. Melnyk & E. Fineout-Overholt (Eds.). *Evidence-based practice in nursing*

    and health care: A guide to best practice (pp. 274-315). Philadelphia, PA: Lippincott

    Williams & Wilkins.

Efstathiou, G., Papastavrou, E., Raftopoulos, V., & Merkouris, A. (2011). Factors influencing

    nurses' compliance with standard precautions in order to avoid occupational exposure to

    microorganisms: A focus group study. *BioMed Central Nursing, 10*(1), 1-12. doi:

    10.1186/1472-6955-10-1

Eiamsitrakoon, T., Apisarnthanarak, A., Nuallaong, W., Khawcharoenporn, T., & Mundy, L. M.

    (2013). Hand hygiene behavior: Translating behavioral research into infection control

    practice. *Infection Control and Hospital Epidemiology, 34*(11), 1137-1145. doi:

    10.1086/673446

Ellingson, K., Haas, J. P., Aiello, A. E., Kusek, L., Maragakis, L. L., Olmsted, R. N., ...Yokoe,

    D. S. (2014). Strategies to prevent healthcare-associated infections through hand hygiene.

    Infection Control and Hospital Epidemiology, 35(8), 937-960. doi: 10.1086/677145

Ellis, S. (2012). Role of emergency nurses in controlling infection. *Emergency Nurse, 20*(8), 16-

    21. doi: 10.7748/en2012.12.20.8.16.c9479

Fitzpatrick, M., Everett-Thomas, R., Nevo, I., Shekhter, I., Rosen, L. F., …Birnbach, D. J.

    (2011). A novel educational programme to improve knowledge regarding health care-

    associated infection and hand hygiene. *International Journal of Nursing Practice, 17*(3),

    269-274. doi:10.1111/j.1440-172X.2011.01934.x

Freeman, S. (2011). Charge nurses' perceptions of infection control. *Mental Health Practice,

    14*(9), 26-9. doi:10.7748/mhp2011.06.14.9.26.c8525

Harne-Britner, S., Allen, M., & Fowler, K. A. (2011). Improving hand hygiene adherence among

    nursing staff. *Journal of Nursing Care Quality, 26*(1), 39-48. doi:

    0.1097/ncq.0b013e3181e0575f

Healthy People. (2014). *Healthcare-associated infections.* Retrieved from

    http://www.healthypeople.gov/2020/topics-objectives/topic/healthcare-associated-

    infections

Jackson, C., Lowton, K., & Griffiths, P. (2014). Infection prevention as a show: A qualitative

    study of nurses' infection prevention behaviours. *International Journal of Nursing

    Studies, 5*(3), 400-408. doi: 10.1016/j.ijnurstu.2013.07.002

Jain, M., Dogra, V., Mishra, B., Thakur, A., & Loomba, P. S. (2013). Factors limiting the usage

    of personal protective equipment in a tertiary-care hospital. *Canadian Journal of

    Infection Control, 28*(2), 105-10. Retrieved from http://www.ipac-

    canada.org/inside_cjic_past_issues.php

Kowitt, B., Jefferson, J., & Mermel, L. A. (2013). Factors associated with hand hygiene

compliance at a tertiary care teaching hospital. *Infection Control Hospital Epidemiology,*

34(11), 1146-1152. doi: 10.1086/673465

Landers, T., McWalters, J., Behta, M., Bufe, G., Ross, B., Vawdrey, D. K., & Larson, E. (2010).

Terms used for isolation practices by nurses at an academic medical center. *Journal of*

Advanced Nursing, 66(10), 2309-19. doi: 10.1111/j.1365-2648.2010.05398.x

Office of Disease Prevention and Health Promotion. (2014). *National action plan to prevent*

health care-associated infections: Road map to elimination. Retrieved from

http://www.health.gov/hai/prevent_hai.asp

Rosenthal, V. D., Pawar, M., Leblebicioglu, H., Navoa-Ng, Villamil-Gomez, W., Armas-Ruiz,

A., …Kubler, A. (2013). Impact of the international nosocomial infection control

consortium (INICC) multidimensional hand hygiene approach over 13 Years in 51 Cities

of 19 limited-resource countries from Latin America, Asia, the Middle East, and Europe.

Infection Control & Hospital Epidemiology, 34(4), 415-23. doi: 10.1086/669860

Salaripour, M. M., & Perl, T. (2013). The effectiveness and the retention level of the

competency-based training for infection prevention and control practices. *Canadian*

Journal of Infection Control, 28(1), 13-7. Retrieved from http://www.ipac-

canada.org/inside_cjic_past_issues.php

Schaffer, M. A., Sandau, K. E., & Diedrick, L. (2013). Evidence-based practice models for

organizational change: Overview and practical applications. *Journal of Advanced*

Nursing, 69(5), 1197-209. doi: 10.1111/j.1365-2648.2012.06122.x

Septimus, E., Yokoe, D. S., Weinstein, R. A., Perl, T. M., Maragakis, L. L., & Berenholtz, S. M.

(2014). Maintaining the momentum of change: The role of the 2014 updates to the

compendium in preventing healthcare-associated infections. *Infection Control & Hospital Epidemiology, 35*(5), 460-3. doi: 10.1086/675820

Siegel, J. D., Rhinehart, E., Jackson, M., & Chiarello, L., & the Healthcare Infection Control Practices Advisory Committee. (2007). *Guideline for isolation precautions: Preventing transmission of infectious agents in healthcare settings.* Retrieved from http://www.cdc.gov/ncidod/dhqp/pdf/isolation2007.pdf

Tan, A. K., & Olivo, J. (2015). Assessing healthcare associated infections and hand hygiene perceptions amongst healthcare professionals. *International Journal of Caring Sciences, 8*(1), 108-14. Retrieved from http://www.internationaljournalofcaringsciences.org/Issue.aspx?issueID=37

Tenna, A., Stenehjem, E. A., Margoles, L., Kacha, E., Blumberg, H. M., & Kempker, R. R. (2014). Infection control knowledge, attitudes, and practices among healthcare workers in Addis Ababa, Ethiopia. *Infection Control Hospital Epidemiology, 34*(12), 1289–1296. doi: 10.1086/673979.

The Joint Commission. (2009). *Measuring hand hygiene adherence: Overcoming the challenges.* Retrieved from http://www.jointcommission.org/topics/hai_hand_hygiene.aspx

Ward, D. J. (2012). Attitudes towards the infection prevention and control nurse: An interview study. *Journal of Nursing Management, 20*(5), 648-58. doi: 10.1111/j.1365-2834.2012.01354.x

World Health Organization. (2009a). *WHO guidelines on hand hygiene in health care: First global patient safety challenge.* Retrieved from http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf?ua=1

World Health Organization. (2009b). *Guide to implementation: A guide to the implementation of the WHO multipronged hand hygiene improvement strategy.* Retrieved from http://www.who.int/gpsc/5may/Guide_to_Implementation.pdf

Williams, C. K., & Carnahan, H. (2013). Development and validation of tools for assessing use of personal protective equipment in healthcare. *Canadian Journal of Infection Control, 28*(2), 97-102. doi: 10.1016/j.ajic.2012.01.027

Wyeth, J. (2013). Hand hygiene and the use of personal protective equipment. *British Journal of Nursing, 22*(16), 920-925. doi: 10.12968/bjon.2013.22.16.920

Yin, J., Reisinger, H. S., Weg, M. V., Schweizer, M. L., Jesson, A., Morgan, D. J.,…Perencevich, E. N., (2014). Establishing evidence-based criteria for directly observed hand hygiene compliance monitoring programs: A prospective, multicenter cohort study. *Infection Control & Hospital Epidemiology, 35(*9), 1163-8. doi: 10.1086/677629

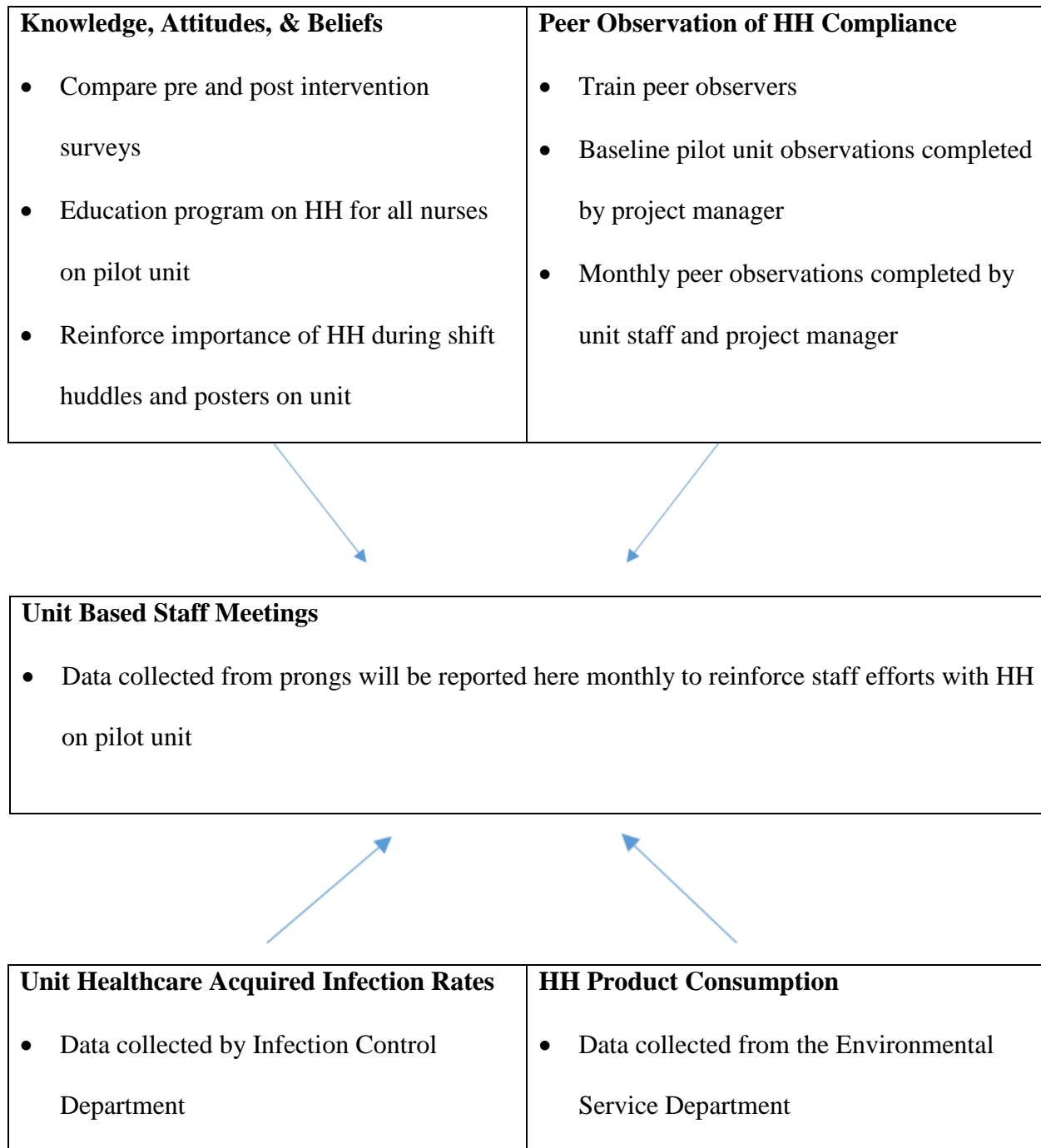**Figure 1.** Flow Chart of Multipronged Hand Hygiene Approach

Knowledge, Attitudes, & Beliefs	**Peer Observation of HH Compliance**
• Compare pre and post intervention surveys • Education program on HH for all nurses on pilot unit • Reinforce importance of HH during shift huddles and posters on unit	• Train peer observers • Baseline pilot unit observations completed by project manager • Monthly peer observations completed by unit staff and project manager

Unit Based Staff Meetings

• Data collected from prongs will be reported here monthly to reinforce staff efforts with HH on pilot unit

Unit Healthcare Acquired Infection Rates	**HH Product Consumption**
• Data collected by Infection Control Department	• Data collected from the Environmental Service Department

Table 1

Demographic Data on Survey Participants

	n (%)
18 – 26 years old	2 (20%)
27 – 34 years old	2 (20%)
35 – 42 years old	2 (20%)
43 – 50 years old	2 (20%)
51 – 58 years old	1 (10%)
>59 years old	1 (10%)

Table 2

Peer Observation Compliance (Positive Hand Hygiene Actions)

	March *n (%)*	*April* *n (%)*	*May* *n (%)*
Registered Nurses			
Clean In	19 (70.4)	54 (84.4)	63 (79.7%)
Clean Out	28 (82.4)	49 (87.5)	44 (83.0%)
Licensed Nursing Assistant			
Clean In	6 (85.7)	15 (88.2)	10 (71.4%)
Clean Out	2 (28.6)	14 (93.3)	10 (83.3%)
Environmental Services			
Clean In	4 (100%)	2 (100%)	3 (100%)
Clean Out	2 (100%)	2 (100%)	1 (100%)
Respiratory Therapy			
Clean In	0 (0%)	--	0 (0%)
Clean Out	0 (0%)	--	0 (0%)
MD			
Clean In	1 (100%)	7 (70%)	3 (75%)
Clean Out	1 (100%)	2 (33.3%)	2 (66.7%)
Student			
Clean In	2 (100%)	1 (100%)	0 (0%)
Clean Out	1 (100%)	4 (100%)	1 (33.3%)
Nurse Practitioner/Physician Assistant			
Clean In	--	4 (100%)	--
Clean Out	--	4 (80%)	--
Overall Compliance (All disciplines)			
Clean In	42 (76.2)	98 (84.7)	101 (78.2%)
Clean Out	47 (72.3)	88 (85.2)	72 (80.6%)

APPENDIX

STATEMENT OF ORIGINAL WORK

Academic Honesty Policy

Capella University's Academic Honesty Policy (3.01.01) holds learners accountable for the integrity of work they submit, which includes but is not limited to discussion postings, assignments, comprehensive exams, and the dissertation or capstone project.

Established in the Policy are the expectations for original work, rationale for the policy, definition of terms that pertain to academic honesty and original work, and disciplinary consequences of academic dishonesty. Also stated in the Policy is the expectation that learners will follow APA rules for citing another person's ideas or works.

The following standards for original work and definition of *plagiarism* are discussed in the Policy:

> Learners are expected to be the sole authors of their work and to acknowledge the authorship of others' work through proper citation and reference. Use of another person's ideas, including another learner's, without proper reference or citation constitutes plagiarism and academic dishonesty and is prohibited conduct. (p. 1)

> Plagiarism is one example of academic dishonesty. Plagiarism is presenting someone else's ideas or work as your own. Plagiarism also includes copying verbatim or rephrasing ideas without properly acknowledging the source by author, date, and publication medium. (p. 2)

Capella University's Research Misconduct Policy (3.03.06) holds learners accountable for research integrity. What constitutes research misconduct is discussed in the Policy:

> Research misconduct includes but is not limited to falsification, fabrication, plagiarism, misappropriation, or other practices that seriously deviate from those that are commonly accepted within the academic community for proposing, conducting, or reviewing research, or in reporting research results. (p. 1)

Learners failing to abide by these policies are subject to consequences, including but not limited to dismissal or revocation of the degree.

Statement of Original Work and Signature

I have read, understood, and abided by Capella University's Academic Honesty Policy (3.01.01) and Research Misconduct Policy (3.03.06), including the Policy Statements, Rationale, and Definitions.

I attest that this dissertation or capstone project is my own work. Where I have used the ideas or words of others, I have paraphrased, summarized, or used direct quotes following the guidelines set forth in the APA *Publication Manual*.

Learner name and date	Karen Britt 7/15/16
Mentor name and school	Debbie Nogueras Capella University