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Table of Contents

Abstract

The Patient Protection and Affordable Care Act of 2010 ushered in a new era of fiscal accountability for healthcare organizations. Healthcare organizations and providers are now jointly held responsible for the improved quality of patient care and sustained reductions in patient care events termed *healthcare-acquired conditions*. To ensure compliance with this newly enacted legislation, the Centers for Medicare and Medicaid Services (CMS) began penalizing hospitals for targeted conditions leading to 30-day readmissions beginning in October 2012. Annually, CMS has focused attention on conditions that endanger patient health and welfare while secondarily attempting to reduce the excessive financial expenditures in care related to 30-day readmissions. CMS penalizes hospitals by decreasing reimbursement for inpatient Medicare rates or by withholding payment through several programs that comprise the Inpatient Prospective Payment System (IPPS). Beginning in fiscal year 2017, Healthcare-acquired *Clostridium difficile infection* 30-day readmission penalties will commence under CMS quality programs. The aim of this quality improvement project was to decrease 30-day readmissions of healthcare-acquired *Clostridium difficile* infection in hospitalized patients. Following a targeted discharge education intervention focused on nursing providers and patients, a decrease in 30-day readmissions of healthcare-acquired *Clostridium difficile infection* was identified at a sustained rate of 14% for 30-day readmissions.

Key Words: incidence of readmission Clostridium difficile, IPPS Clostridium difficile, case management Clostridium difficile discharge, CMS Clostridium difficile, and Clostridium difficile discharge teaching.

SECTION II: INTRODUCTION

Background Knowledge

The average length of stay for hospitalized patients has decreased annually to 4.5 days (Weis & Elixhauser, 2014). As lengths of stay decreased, nurses recognized gaps in continuity of care transitions that often resulted in readmissions because of failed processes of care. Nursing evidence has focused on the inability of patients to recall discharge education or instructions related to self-care activity when home. Research undertaken by the Centers for Medicare and Medicaid (CMS) explore inadequately prepared patients and families to continue ongoing patient procedures or care in the home setting (Li, Yong, Hakendorf, Ben-Tovin, & Thompson, 2015). In addition, a shortage of transitional services exists to ensure a seamless discharge process into the post-acute care setting (James, Hall, Joynt, & Lott, 2013).

Healthcare-associated infections have increased at an alarming rate in recent years, most notably *Clostridium difficile infection* (CDI; Sreeamoju, Montie, Ramirez, & Ayeni, 2010). The proportion of discharged patients diagnosed with CDI has more than doubled in less than nine years (Dubberke et al., 2014, p. 628). Increased hospital lengths of stay averaged greater than five days when patients acquired CDI, and costs per episode of care exceeding $15,000 increased during the same period (Dubberke et al., 2014, p. 629).

Clostridium difficile is a Gram-positive, rod-shaped spore-forming anaerobic bacterium (Nanwa et al., 2015, p. 511). CDI exposure is commonly associated with care received in the hospital setting; however, CDI has been documented in populations with no exposure to healthcare facilities and in populations at risk of CDI (Nanwa et al., 2015). CDI is commonly found in the environment and is now emerging as a pathogenic microorganism (Nanwa et al., 2015). CDI symptoms include fever, abdominal cramps, nausea, excessive diarrhea that can

progress to toxic megacolon, and death (Nanwa et al., 2015). Risk factors for CDI are lengthy hospitalizations, prolonged antibiotic exposure, multiple comorbidities, and age over 65 (Nanwa et al., 2015).

Healthcare-acquired CDI has been identified as a driving factor in hospital readmission rates, increasing from 11% in 2000 to over 21% in 2009 (O'Brien, Lahue, Caro, & Davidson, 2007, p. 1225). Hospital readmission within 30 days of discharge is disruptive to patient healing and healthcare costs exceed over $17 billion annually (Horwitz et al., 2011, p. 7). Multiple studies have implicated failed inpatient care quality and discharge care transitions, which lead to 30-day readmissions for various healthcare conditions (O'Brien et al., 2007, p. 8).

Landmark work undertaken by Jencks, Williams, and Coleman in 2009 became a catalyst for decreasing readmission rates. Using Medicare claims data from 2003 to 2004, the authors identified a 20% readmission rate within 30-days of discharge for all-cause readmissions (Jencks et al., 2009). Although readmission rates for other chronic conditions have remained relatively stable with limited variation, CDI readmission rates have surpassed these chronic conditions during the same period (Jencks et al., 2009).

Reported by the Kaiser Family foundation the Centers for Medicare and Medicaid Services (CMS) began penalizing hospitals for 30-day readmission rates beginning in October 2012 (Boccuti & Casillas, 2015). Annually, CMS has added chronic conditions that are financial outliers in the cost of care related to 30-day readmissions; these readmissions indicate failed quality of care. CMS penalizes hospitals by decreasing reimbursement for inpatient Medicare rates or by withholding payment through several programs in the Inpatient Prospective Payment System (IPPS). The IPPS includes (a) value-based purchasing (VBP), (b) hospital-acquired

conditions (HAC), (c) inpatient quality reporting (IQR), and (d) hospital readmissions reduction program (HRRP; Wetzel & Wheatley, 2014, p. 14).

Beginning in fiscal year 2017, healthcare-acquired CDI 30-day readmission penalties will commence under the IPPS program. This penalty system creates a "double-strike penalty" for healthcare institutions because penalties under VBP and the HAC programs combine to increase the overall penalty. Worst-case scenarios for healthcare facilities would be the combination of the "trifecta CMS penalties" with other quality of care programs (IQR and HRRP) within the IPPS. The penalties may decrease inpatient Medicare payments by up to 6% (Wetzel & Wheatley, 2014, p. 26).

Local Problem

The medical center selected for this project is part of a larger healthcare system (referred to throughout this paper as "the healthcare system") comprising four medical facilities with 1,155 licensed beds serving a diverse and medically complex patient population in San Francisco, California. The healthcare system is recognized regionally and nationally for leading-edge medical advancements in patient care (Fryer, 2015). For 2011, the California Department of Public Health (CDPH) indicated the healthcare system reported a total of 148 cases of healthcare-acquired *Clostridium difficile* and a rate of 9.5% per 10,000 patient days, which is statistically similar to the statewide reported average.

The healthcare system provides nearly 40% of all medical care delivered in San Francisco among its four medical centers and affiliated physician groups. Methods to reduce 30-day readmissions penalties within the system are priority goals (The Lewin Group, 2009, p. 32). According to publicly reported data from CMS in 2013, the healthcare system had a lower than average 30-day readmission rate (14.8%) compared to the statewide average (15.9%) for

currently selected 30-day readmit chronic conditions (U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services [CMS], 2015). The addition of healthcare-acquired CDI has created uncharted territory of 30-day readmission penalties related specifically to hospital-acquired infections (CMS, 2015).

In March 2014, the healthcare system implemented a two-year pilot program consisting of two transitional care coordinators, hired to reduce 30-day readmissions for conditions identified by CMS that qualified for readmission penalties. The healthcare system implemented the reengineered discharge coordination project (RED; Jack, Paasche-Orlow, & Mitchell, 2013). In the RED program, patients received focused education about their conditions, and as part of the overall discharge plan, specific educational interventions were continued in the patient-specific discharge binder along with self-management instructions if a problem was encountered in the outpatient setting (Boutwell, Griffin, Hwu, & Shannon, 2009, p. 3). At the time of this project, the healthcare system was evaluating the RED targeted intervention.

Following the advice of a nursing manager involved in this quality work, a discussion with the care coordinators occurred specific to this quality improvement project. However, no collaboration with the project RED care coordinators and this project could be undertaken due to organizational specificity of the project RED pilot program. Pending future outcome assessments of the RED program's effectiveness in spring 2016, a future consideration for sustainment of this quality improvement project could involve transitioning healthcare-acquired *Clostridium difficile* patients under the umbrella of this program.

Discharges typically occur after morning multidisciplinary medical team rounds. The DNP student observed morning rounds and noted nurses were occasionally unaware of the potential for patient discharges. When surveyed, nurses reported feeling pressured to complete

the necessary tasks involved with teaching discharged patients adequately in addition to managing their other patients. Additionally, nurses reported patients being focused on leaving than on engaging in a meaningful discharge education process to ensure a cohesive transfer into the post-acute care setting. Although at times, the healthcare facilities electronic healthcare record (EHR) may print discharge instructions for healthcare-acquired CDI, printing typically does not occur, (J. Cartagena, personal communication, May 5, 2015). Thus, nurses provide healthcare-acquired CDI patient discharge teaching through verbal instructions with no specific written content about healthcare-acquired CDI in the post-acute care setting.

The potential impact of readmission penalties related to *Clostridium difficile* is based on the average daily inpatient prevalence rate of 20% (13.1 per 1,000 patients) in acute-care settings (Jarvis, Schlosser, Jarvis, & Chinn, 2009, p. 268). Initial work within the healthcare system has focused on multifactorial infection control protocols aimed at preventing healthcare-acquired CDI. Despite targeted interventions to maintain and improve rates of healthcare-acquired CDI, new challenges emerged in the form of the CMS IPPS program. The healthcare system is currently engaged in identifying additional areas of improvement to reduce 30-day CDI readmissions.

Intended Improvement

The aim of this project was to improve care relating to two competing causes of hospital readmissions related to CDI. The first competing cause was the lack of patient understanding related to general patient self-care activity when infected with CDI. The second competing cause was the reoccurrence of CDI related to improper care transitions from the in-patient setting (hospital) to outside healthcare services. This project was intended to improve discharge education to prevent hospital readmissions by improving patient knowledge and reinforcing

nursing knowledge to enhance and improve patient care transitions into the post-acute care setting.

Unlike prior CMS payment reductions for healthcare-associated infections, the *Clostridium difficile* 30-day readmission penalties are a new addition to the CMS readmission penalty program, requiring a multifactorial organizational approach in terms of prevention. The Manager of Infection Control and the Director of Quality at the healthcare system approved such a multifactorial organizational approach through the formation of an ad hoc quality improvement team (QIT).

An ad hoc QIT was formed to identify and frame the project in the context of a process improvement program used by the organization. The QIT consisted of the DNP student, the Manager of Infection Control, the Director of Quality, a nurse manager, a pharmacist who specializes in antibiotic stewardship, an infectious disease physician, and a hospital epidemiologist. The QIT members reviewed the proposed penalty guidelines. After considering the literature, the team evaluated the need for improved discharge teaching. The QIT found discharge process failures related to medication reconciliation, lack of patient-specific knowledge about healthcare-acquired CDI, continued follow up with healthcare providers after discharge, and symptom monitoring in the post-acute care setting.

Most healthcare-acquired *Clostridium difficile* patients are discharged into the home environment or are followed loosely by transitional care services. Compared to other patients discharged to post-acute care settings, this group has a higher 30-day readmission rate (see Appendix A for readmission rates). Patients discharged into skilled nursing facilities or post-acute care healthcare facilities have lower readmissions because of continued nursing care and assessment (Li, Yong, Hakendorf, Ben-Tovin, & Thompson, 2015). A prevailing theme from

the literature is that CDI treatment failure or reoccurrence is more quickly recognized and treated in these post-acute care settings than it is in the home environment, thus preventing a majority of 30-day readmissions in this cohort (Li, Yong, Hakendorf, Ben-Tovin, & Thompson, 2015).

Review of the Evidence

A comprehensive review of the literature was conducted using keywords. The keywords included *readmissions,* Clostridium difficile *readmissions, value-based purchasing* C. difficile*, value-based purchasing* C. difficile *readmission, HAI payment reduction 2017, HAC CMS penalties, incidence of readmission* Clostridium difficile, *IPPS* Clostridium difficile*, case management* Clostridium difficile *discharge, CMS* Clostridium difficile*, and* Clostridium difficile *discharge teaching*. Dates of publications were limited to the last ten years because this range encompassed pre-CMS readmission penalty programs. Foundational articles greater than ten years are included as guideposts specific to changing dynamics of CDI. PubMed, CINAHL, and Cochrane were used as the primary resources. Only one experimental control study evaluating a targeted discharge program to improve (decrease) readmission rates was identified in the literature search (Jack, Paasche-Orlow, & Mitchell, 2013).

The Johns Hopkins Nursing Evidence-Based Practice Appraisal (JHNEBP) tools were used to guide the literature review and classify the selected works. Initial articles were chosen based on significance to 30-day readmissions related to *Clostridium difficile* and preventing readmissions. The remaining articles supported best-practice approaches to improving discharge education as a means to decrease 30-day readmissions. A detailed review of the evidence reviewed with the JHNEBP tool can be found in Appendix B.

Clostridium difficile has increased globally in incidence and virulence, as shown by regional outbreaks of highly toxigenic strains leading to higher than expected morbidity and

mortality (O'Brien et al., 2007, p. 1219). In prior studies using community rates of patients infected with CDI obtained during the 1970s, researchers reported hospital admission rates of 0.02% of all medical–surgical patients over a 10-month period nationally (O'Brien et al., 2007, p. 1225). During the 1980s, the hospitalization rate of CDI was 1.4 patients per 100,000 persons receiving antibiotic therapy. Data obtained during the 1990s in healthcare settings showed that over 20,000 cases of CDI were driving inpatient hospitalization readmissions (O'Brien et al., 2007, p. 1220).

Data gathered between 2003 and 2004 showed an annual increase of 25%, leading to 400,000 to 500,000 new cases annually (O'Brien et al., 2007, p. 1220). Between 2000 and 2010, not only did the incidence of CDI double in the acute-care setting, but patient deaths attributable to CDI also increased nearly 10-fold, and readmissions because of healthcare-acquired CDI increased to 4.1 per 1,000 admissions (Tabak, Johannes, Sun, Nunez, & McDonald, 2015). Further, in recent literature, researchers have described a changing epidemiological pattern in which rates of CDI have reached 94% compared to prior or current healthcare episodes of care (Gerding & Lessa, 2015). The growing prevalence of CDI directly affects potential readmission penalties because the increasing numbers of CDI affects not only the acute care setting but also community settings (Gerding & Lessa, 2015).

Chopra et al. (2015) found patients with *Clostridium difficile* were more frequently readmitted to the hospital for any reason (all chronic conditions); CDI was a primary driver of the readmission. All-cause readmissions (N = 7,379) for the study healthcare system indicated a 14.4% readmission rate, and CDI readmissions occurred twice as frequently (30.1%) among the study cohort (Chopra et al., 2015, p. 316). Chopra et al. (2015) found all-cause readmission patients had an average length of stay (LOS) of 5.6 days, compared to the CDI cohort of 10 to 12

days LOS. Copra et al. (2015) found CDI contributed annually to a higher-than-average number of 30-day readmissions. Thus, CDI readmissions created unintended consequences for healthcare facilities by decreasing bed turnover rates while driving up hospital costs of care.

Clostridium difficile 30-day readmissions were examined across 16 states. When Chopra et al. (2015) compared these rates to their study cohort, they identified nearly similar CDI readmission rates of 29.1%. Communities with a higher CDI disease burden placed healthcare systems at an increased risk of readmission penalties because of the larger at-risk population (Chopra et al., 2015).

Authors of a multisite cohort study reported that more than 25% of the surviving ICU patients who had CDI during their initial hospitalization had higher 30-day readmissions overall and higher rates of recurrent episodes of CDI causing multiple readmissions within 30-days (Zilberberg, Shorr, Micek, & Kollef, 2015, p. 277). When logistic regression was applied to the study cohort, the strongest predictor driving readmission within 30-days was CDI recurrence (treatment failure) (Zilberberg et al., 2015, p. 277). Considering the prevailing rates of readmissions related to *Clostridium difficile*, CMS would classify the quality of care delivered as poor, thus creating an urgent need to identify tangible methods to reduce readmission rates (Zilberberg et al., 2015, p. 277).

Findings from multiple studies directly implicate *Clostridium difficile* infection as a primary driver of 30-day readmissions (Elixhauser, Steiner, & Gould, 2012; Gerhardt et al., 2013; Whitaker, Brown, Vidal, & Calcaterra, 2007; Yanke et al., 2015). Olsen, Yan, Reske, Zilberberg, and Dubberke (2015) noted that recurrent CDIs occurred in more than 30% of their study population, driving their readmission rate to 85% or 2.5 times higher among the cohort (p. 320). Olsen et al. were the first to examine recurrent episodes of CDI specifically, including

its direct effect of creating an unrecognized cohort of high-risk patients at the time of discharge (Olsen et al., 2015). Argamany, Aitken, Lee, Boyd, and Reveles (2015) identified regional and seasonal variations within the United States related to CDIs in an examination of a decade of discharge coding data (ICD-9) specific to *Clostridium difficile.* Regional variation of incidence ranged from the Northeast U.S. region (8.0 CDI discharges/1,000 total discharges) to the Western U.S. region (4.8 CDI discharges/1,000 total discharges; Argamany et al., 2015, p. 436). Until recently, few well-known studies existed evaluating the actual impact of the *Clostridium difficile* disease burden on 30-day readmissions.

Literature about chronic conditions that are part of CMS readmission penalties was reviewed for relevant information regarding *Clostridium difficile* patients. Stevens (2015) proposed discarding prepackaged discharge instructions in favor of enhanced and individualized educational content. Emphasizing individualized discharge education at the time of care transition can prevent readmissions (Stevens, 2015). Stevens (2015) noted that 78% of patients discharged from an emergency department had difficulty understanding preprinted or computer-generated discharge instructions that were not individualized to their specific needs. Patients who were instructed to follow up with their primary care physician at the time of discharge were found to have higher readmission rates—they often failed to follow up because they could not recall the instructions (Stevens, 2015).

Considering the discharge process as a transfer in responsibility from inpatient care physicians and nursing staff to the patient and his or her primary care physicians may be a concept that is not entirely appreciated. For example, Kripalani, Jackson, Schnipper, and Coleman (2007) contended this critical point in care transition coincides with simultaneous medication regimen changes (e.g., stopping medications, altering doses, changing dosing

schedules, beginning new medications, or failing to fill discharged medications), which patients are expected to master immediately on discharge. Medication transitions have been an unrecognized critical breaking point for patients with *Clostridium difficile:* Any failure with medication compliance can lead to readmission well before 30 days (Kripalani et al., 2007).

Similarly, Jacelon, Macdonald, and Fitzgerald (2014) noted four interventions that successfully prevented readmissions: (a) enhanced care during the discharge (transition) process, (b) improved patient education and self-care activity training, (c) multidisciplinary team management, and (d) patient-centered care planning (Jacelon et al., 2014, p. 13). Others in the healthcare team—with the exception of the bedside nurse—have typically implemented these interventions (Jacelon et al., 2014, p. 13). Involving the primary care nurse in the first and second method was found to add value to the discharge process (Jacelon et al., 2014).

Rau (2014) found that hospitals providing care to higher numbers of low-income patients had higher readmission rates; in contrast, those facilities that had lower numbers of these patients had lower readmission rates (p. 4). One of the four hospitals in the system participating in this project was considered a "safety net" hospital by the city of San Francisco, serving the most vulnerable populations in the Mission District. A second hospital, although in a more affluent area of San Francisco (Castro), had a growing number of low-income and underserved patients because of its proximity to economically poorer areas of the city (Lower Haight, Tenderloin and the Market Street corridor). These patient populations are factored into the patient population at the selected facility due to the high volume of internal patient transfers necessitated by acuity.

Preventable readmissions can be classified into four scenarios: (a) the initial hospitalization focused on quality of care but failed to deliver; (b) discharge planning was inadequate for the patient and the patient's needs; (c) the post-discharge follow-up was

inappropriate and involved impaired communication between care transitions; and (d) outpatient services were not dedicated or followed per discharge orders (Goldfield et al., 2008).

When patients and healthcare providers were interviewed, an identical pattern was noted (Taverner, 2013). Taverner (2013) reported four drivers of 30-day readmissions in certain populations: (a) patients had difficulty managing their medications; (b) patients' medical records were lacking, incomplete, or missing; (c) patients did not follow up with the primary care physician; and (d) patients lacked knowledge of self-assessment for symptoms indicative of a change in condition.

Li et al. (2015) contended patient cohorts with gastrointestinal, oncology, and infectious disease issues readmit more consistently across 30-day periods (p. 59). Collins, Ayturk, Anderson, and Santry (2015) reported the median time of readmission was 25 days, and more than 29% readmitted within two weeks; 56% readmitted within 30 days (p. 90). Regulations in the Patient Protection and Affordable Care Act (PPACA) attempt to reduce readmissions through improved patient discharge and care transitions (Collins et al., 2015).

Conceptual Framework

Two theoretical and conceptual frameworks underlie this project: self-care agency as theorized by Orem (2003) and Donabedian's model (Donabedian, 1988). Both frameworks support patient discharge teaching and education. Combined, both frameworks identify the patient (or family or caregivers if patient is not capable) as the responsible provider of care and hold the nurse accountable for ensuring the proper metrics of patient education and teaching are accomplished.

Orem, Renpenning, and Taylor (2003) contended that self-care is a learned human behavior, involving deliberate self-care actions performed by the individual person. Orem et al.

(2003) described three forms of nursing care: caring directly for the patient, helping the patient provide his or her own care, and educating (instructing) the patient and others to acquire knowledge and skill to undertake the necessary care (p. 8). The second and third forms of nursing care are foundational to ensuring this improvement project achieves its intended outcomes. Schneider et al. (1993) asserted that patients who undertake active roles in self-care activity once they return home are presumed to have fewer readmissions (p. 44).

Orem's theory incorporated internal and external forces that conceivably create barriers to successful self-care activity, including the patient's home environment, support systems, and available resources (Orem et al., 2003). Self-care deficiencies have correlated to greater emotional demands that can incapacitate the patient's ability to engage in successful aftercare instructions (Orem et al., 2003). Developing self-care agency early in the discharge process enhances patients' understanding of self-care activity and provides encouragement to overcome challenges encountered in self-care (Soderhamn, 2003).

Donabedian (1988) postulated quality of patient care extends outward in responsibility to encompass patients and family. The ability to maintain satisfactory interpersonal relationships with patients and family is central to influencing care transitions from the medical providers to the patients and families (Donabedian, 1988). The healthcare provider must ensure the provider–patient relationship remains collaborative and allows for a meaningful transition of quality care from provider to patient with a clear boundary (Donabedian, 1988, p. 1744). This concept is especially true for patients who receive inpatient treatment from their specialty primary care providers rather than from the healthcare systems' hospitalists.

SECTION III: METHODS

Ethical Issues

Nursing is built on the foundational science of caring and advocacy for health and dignity of patients, families, and communities (American Nurses Association, [ANA], 2015). A philosophy of social justice supports the work of nurses and drives influential practices addressing the healthcare needs of patients and their communities. Considering this framework, nurses have a duty to advocate for improving and ensuring a discharge process that ameliorates barriers while ensuring successful transitions into post-acute care settings (ANA, 2015).

Providing patient discharge education through nurse-driven discharge teaching designed to improve patients' knowledge and technical skills is one of the nursing profession's standards of professional care (ANA, 2015). The ANA (2015) defines ethical nursing in Provision 4 of its code of ethics as authority, accountability, and responsibility. Specifically delineated in the provision is nurses' responsibility for patient education. Further, Interpretative Statement 1.4 of Provision 1 of the code of ethics outlines the nurse's obligation to provide assessment and understanding of patient education in order to ensure patients' comprehension of the material and understanding of the implications to patients' health and welfare (ANA, 2015).

The intended aim of this project was to implement a targeted initiative to enhance nursing knowledge regarding discharge education for patients as a primary means to prevent readmissions caused by healthcare-acquired CDI. Since the focus was on quality improvement in discharge planning and education, this project did not require an Institutional Review Board (IRB) approval for implementation. The project was evaluated and approved as quality improvement work through the School of Nursing and Health Professions at the University of San Francisco (Appendix C). The IRB of the healthcare system involved in this project

approved this project as quality improvement work as well and exempted the need for IRB approval (see Appendix D).

Setting

The healthcare system in this project is part of a larger nonprofit healthcare corporation that provides healthcare for 1% of the entire population in the United States (Browner & Townsend, 2015). In 2009, the healthcare system provided the largest share of medical services in San Francisco, comprising 33% of medical care delivered (The Lewin Group, 2009, p. 20). The healthcare system is a complex, integrated system of four hospitals; two new replacement hospitals are currently under construction. Numerous associated physician clinics and outpatient settings serving a culturally diverse population in San Francisco, California, are the primary drivers of inpatient admissions. The healthcare facility is also a tertiary receiving institution, admitting a large number of critically ill patients from outlying facilities within the 25-facility healthcare system. The guiding organizational mission is the enhancement of the patients' well-being through a commitment to compassion and excellence in healthcare services (Sutter Health, 2015, p. 6).

The Lewin Group (2009) prepared a master plan focused on local population demographics using public data from the California Office of Statewide Health Planning. As of 2009, the healthcare system provided care to nearly 55% of persons over the age of 45 (The Lewin Group, 2009, p. 16). The healthcare system provided a larger share of services to Asians and Hispanics compared to other healthcare facilities within the city (The Lewin Group, 2009, p. 17). The top three payors comprised Medicare (46%), private coverage (34%), and Medi-Cal (16%; The Lewin Group, 2009).

In fiscal year 2014, the healthcare system publicly reported 112 healthcare-acquired *Clostridium difficile* cases, but no available readmission data. First quarter 2015 showed 42 patient discharges occurring from the acute-care inpatient setting. Of this cohort, 13 (30%) readmissions occurred within 30 days after discharge.

The healthcare system currently has a robust Medicare Fee for Service (FFS) and Transitions of Care program focused on reducing 30-day readmission penalties for myocardial infarctions, pneumonia, knee/hip arthroplasty, chronic obstructive pulmonary disease, and congestive heart failure. A targeted effort to enhance discharge education to prevent 30-day readmissions specifically targeting *Clostridium difficile* is not part of these programs. Presently the healthcare system utilizes only evidenced-based practices (enhanced cleaning, antimicrobial stewardship, early contact isolation, hand washing, and private rooms) as primary methods of preventing patients' exposures to CDI (see Appendix E for a CDI transmission prevention fishbone diagram).

Planning the Intervention

The improvement project occurred at a mixed-specialty medical/surgical nursing unit at one of the four medical facilities. The unit comprised three individually separate but contiguous patient-care areas (nodes). Each node had nine double patient rooms and a bed capacity of 18 patients per node for a total unit capacity of 54 in-patient beds. The institutional CDI policy required single occupancy rooms for actively infected patients and stipulated patients would maintain single occupancy rooms until discharge. The target unit led the facility with healthcare-acquired CDI because of its high mixed-acuity patient population (oncology, medical/surgical, and post-transplant). Nursing staff rotated through each node as directed by institutional

scheduling practices. This practice was ideal for the quality improvement project because nursing staff moved throughout the unit and thus were not restricted to one node.

The current practice of educating patients consists of nurses' verbal and written information related to *Clostridium difficile* given at the time of discharge. While prewritten patient education is available in different languages, nursing staff typically use verbal instructions as the primary driver of discharge education and the written instructions as reference material for the patient. In addition, nursing staff provide discharge education in the language designated by the patient.

The implementation of enhanced *Clostridium difficile* discharge education materials serve to improve the patient outcomes of this project by improving these areas of patient education:

1. Educating patients on self-care activity with greater specificity about implementing hygiene practices in the home environment
2. Educating patients to improve the patient's ability to identify symptoms that indicate CDI recurrence
3. Managing medications and promoting understanding of antibiotics used in the treatment of CDI
4. Assessing the patient proactively and communicating with the primary care team to manage recurrent episodes in the outpatient setting better.

Assessing patient *Clostridium difficile* discharge education. In the spring of 2015, the DNP student developed a 10-question survey to assess nursing discharge practices, specifically evaluating *Clostridium difficile* discharge education (see Appendix F for the preintervention

nursing assessment). Thirty-two nurses on the selected medical–surgical unit completed the surveys. Nursing staff comments on the survey forms included:

1. We don't discharge patients with *Clostridium difficile* infections.
2. I make sure the patients are told about hand washing and to finish all antibiotics.
3. I instruct patients to return to the emergency room if they have problems.
4. I don't give patients any printed *Clostridium difficile* instructions, only verbal instructions.
5. I don't focus on antibiotics specific to CDI and what to expect after discharge.
6. I figured antibiotics worked the first time to eradicate *Clostridium difficile.*
7. I don't do anything different for CDI education then I would for a regular infection elsewhere in the body.
8. I don't educate to CDI reoccurrence.
9. I don't use any other resources for CDI education other than verbal directions.
10. I don't educate to environmental issues at home, only hand washing and pericare.
11. Tapered antibiotics; How do I recognize these?
12. I try to educate using teach back methods but often times do not have the time to invest in this process.

Results obtained from the pre-intervention nursing surveys guided the development of healthcare-acquired CDI-specific nursing education to enhance discharge education.

The QIT undertook a high-level assessment of eight domains responsible for healthcare-acquired CDI transmission prevention (see Appendix E for the CDI transmission fishbone diagram). Initially, the Manager of Infection Control believed more work could be done on environmental cleaning as a means to reduce hospital-acquired CDI, which in turn would drive

down healthcare-acquired CDI 30-day readmissions (prevention). In contrast, the Hospital Epidemiologist and Pharmacist believed promoting antimicrobial stewardship to limit antibiotic exposure, applying antibiotic pressure to known agents (quinolones), and identifying unnecessary antibiotics were process measures that would help reduce 30-day readmissions. The QIT initially believed that areas within the acute-care setting represented the most potential as a means to reduce 30-day readmissions.

The DNP student presented to the QIT the identified gap in nursing practice related to CDI education for the targeted unit using hospital-acquired CDI data, as well as the first-quarter 30-day readmission data, followed by a discussion of the implications of the data given current CMS regulations. The QIT evaluated estimated monetary loss figures specific to CMS readmission penalties made available by the corporate office; this data is protected information and unable to be elucidated further. The QIT discussed the implications of the evidence and concluded that CDI transmission is multifactorial with no one direct causative source. Given the findings from the nursing survey, the gap analysis (Appendix K), the projected 30-day CDI penalty impact, and current supporting literature, the QIT agreed to move forward with the proposed intervention.

Teach-back discharge education. Presently the healthcare system uses the teach-back method to provide patient discharge education. The survey of nursing practices conducted to assess the present discharge education of *Clostridium difficile* patients revealed a gap in practice. Nurses were providing discharge education related to CDI, but because of the identified gap in nursing knowledge related to the evolving pathology of CDI, patients were unprepared to manage CDI in the post-acute care setting. The DNP student collaborated with bedside nursing staff to bridge this identified gap in practice through the targeted use of a printed educational

handout guiding patients post-discharge to continue self-care activities related to CDI (see Appendix G for the patient education materials).

Cost-benefit. Nonprofit healthcare institutions are held to high standards of ethical and fiscal accountability by regulatory agencies and consumer advocacy groups. For example, the healthcare system in this project is expected to provide quality care economically and consistently, thereby producing sustainable and measurable quality outcomes through the inclusion in federal reimbursement programs. Fleming (1994) contended the value of quality improvement work within the organization provides benefits that exceed the costs of implementing quality improvement work. As the organization initiates quality improvement work, the concept that quality improvement has intangible aspects that are hard to measure was explored by the QIT. Thus, managers must estimate explicit quantifiable financial gains based on the proposed effects of the quality improvement intervention.

Direct costs for the purpose of this project included one full-time equivalent (FTE) nurse at a cost of $135,000 (inclusive of benefits at 20%). A single episode of healthcare-acquired CDI is estimated to cost $33,055 (in 2012 U.S. dollars; Kwon, Olsen, & Dubberke, 2015, p. 130). This figure provides the framework to determine the organizational cost of healthcare-acquired CDI. The single facility in this project is estimated to have 70 healthcare-acquired *Clostridium difficile* 30-day readmissions in 2015 (based on first-quarter 2015 findings and multiplied by four quarters); therefore, the estimated direct cost to the healthcare system is $2,313,850 ($33,055 x 70 = $2,313,850). Estimating the annual economic impact of 125 (70 from the project hospital and 55 from the 3 other campuses totals 125 cases) patients with 30-day healthcare-acquired CDI readmission across the four hospitals in the healthcare system in 2015 produces a worrisome total cost of $4,131,857 ($33,055 x 125 = $4,131,857). Assuming this

quality improvement initiative could initially achieve a 10% reduction (10% of 70 = 7 patients) in 30-day healthcare-acquired CDI patients, a savings of $231,385 ($33,055 x 7 = $231,385) would be gained (see Appendix I for a description of the financials).

Timeframe. In January 2015, the DNP student recognized an opportunity for organizational improvement and received approval to begin immediate implementation of the quality improvement intervention. A Gantt chart (see Appendix J) was prepared to define the necessary processes required for implementation of this quality improvement initiative. This tool provided the DNP student with a visual layout of the intervention and allowed simultaneous steps to be carried out seamlessly.

The proposal was evidence-based using current literature and provided a financial plan and budget, including a cost-benefit analysis. The planning phase focused on identifying current discharge processes and bridging identified gaps related to content specific to the identified intervention. The execution phase consisted of targeting nursing education and working with nurses to ensure proper implementation of the discharge process for healthcare-acquired *Clostridium difficile* patients. The DNP student tracked the log of patients and discharge education during a control period in which data trends regarding sustainability and continuing gaps were identified and monitored during and after the intervention, so that practices could be monitored and corrected simultaneously. The DNP student provided monthly updates on 30-day readmission rate's which were presented to key stakeholders to provide information about trends in intervention success and to gain approval to continue interventions needed to maintain reductions in 30-day readmissions.

Responsibility and communication plan. The procedures for maintaining accountability and communication align with the system's current organizational structure.

Quality improvement team (QIT) members, physicians, nursing leaders, bedside nurses, and patients and their families are all key stakeholders in ensuring a successful discharge. Key stakeholders included the DNP student and the bedside nurses, who worked together to ensure enhanced patient discharge education was occurring as planned.

The DNP student maintained oversight of the project and reported the progress of the improvement interventions through regularly scheduled meetings or bi-weekly e-mails to members of the QIT. The DNP student communicated with bedside nurses when a healthcare-acquired CDI was identified to ensure that discharge education occurred. Communication with bedside nurses occurred through phone or face-to-face conversations in the nursing units.

Reporting of this improvement project's findings and results to executive quality committees, medical executive committees, and the board occurred at the discretion of the Director of Quality and was therefore beyond the organizational purview of the DNP student. The DNP student did, however, report the findings of the project monthly at the Infection Control Committee (ICC) and nursing leadership meetings.

Implementation of the Project

Quality improvement team members, in conjunction with bedside nurses, were key stakeholders in implementing the quality improvement intervention. The most accessible CDI cohort were patients who could read, write, and speak English. Patients whose primary language was not English received verbal instructions via a translator phone or a healthcare-certified translator. Preprinted educational material in each patient's language of preference was already used by the healthcare organization. For this project, the healthcare translating service did not have time to modify written instructions specific to the improvement intervention, which would

have allowed the printing of project-specific educational materials for the non-English-speaking cohort of patients.

Evaluation and implementation of nursing education. The DNP student created and delivered an educational in-service to nursing staff entitled *Clostridium difficile: Advancing Nursing Knowledge to Avoid 30-day Readmissions* (see Appendix H for the nurse training PowerPoint). Education focused on the high rate of treatment failure and recurrence following initial antimicrobial treatment of CDI as noted in current literature. Improper patient engagement and education (identified in the gap analysis) were discussed as the primary drivers of post-acute care failures leading to readmissions. This educational content was designed to close an identified gap in nursing understanding specific to healthcare-acquired CDI.

The educational sessions covered a two-day period, including both morning and afternoon/evening nursing shifts. Twenty-eight registered nurses (RNs) attended the educational session. After the nursing in-service, the DNP student performed random observations of nurses who used the enhanced *Clostridium difficile* discharge educational handout at the time of patient discharge teaching. Only four random observations of different nurses were observed because of competing workflow patterns of the patient discharge process that occurred when the DNP student was on the floor.

All observations were conducted using the established nursing policy specific to discharge teaching (a pre/post education assessment using teach back methods of questioning), and all occurred without deviation from the policy (e.g.. “Mister XYZ, can you please tell me how you would take your antibiotics that treat your C.diff infection? How would you know when to call the doctor/nurse? Who would you call if you have diarrhea, nausea, abdominal pain or vomiting that gets worse after you finish your antibiotics?”). The nurse applied all concepts

covered in the educational in-service during the patient discharge education teaching sessions, in addition to correctly utilizing and combining verbal instructions with the written discharge education information. All the patients were engaged, asked appropriate questions and restated concepts of CDI to the nurse when follow-up questions were asked of them.

Communication of the intervention occurred through informational flyers posted in staff areas and through one-on-one informational discussion with nursing staff. Nurses were apprised of the specific date of implementation and nursing managers ensured unit charge nurses were rounding with staff on the date of implementation. The DNP student followed up with the unit charge nurse on the date of project implementation to address any outstanding issues and to answer questions related to project resources.

Additionally, infection control nurses monitored daily microbiologic cultures specifically for *Clostridium difficile* and e-mailed the nursing managers and charge nurses in these units regarding the identified infection. These informational e-mails additionally contained the facility's enhanced contact precautions sign, information on CDI, a brief summary of the expectations related to this quality improvement project and enhanced discharge patient education information sheets for ease of accessibility.

When patients were identified with healthcare-acquired CDI, the infection control nurse responsible for rounding on the unit would follow up directly with the primary nurse to inquire if pre-discharge CDI education was occurring. If nursing education was not occurring specific to CDI that was consistent with this quality improvement project, a gentle reminder was provided to the bedside nurse to ensure discharge education was provided and assist with any questions, concerns or identified issues. Nurses were reminded to use the enhanced patient-education sheet as a guide when providing teach-back discharge education. In addition, nurses were asked to

apply the three aims that all patients need to know specific to their illness and of this patient-education methodology as specified by the institution's nursing policy: (a) What is my main problem? (b) What do I need to do? and (c) Why is it important that I do this?

Planning the Study of the Intervention

CMS designated 2015 as the inaugural year to begin collecting and tabulating appropriate readmission penalties for healthcare-acquired *Clostridium difficile* 30-day readmissions. Data collected this year (2015) will affect CMS payments beginning with the 2017 budgetary cycle. First-quarter (January, February, and March) 2015 healthcare-acquired CDI 30-day readmission rates measured 36%, which negatively affects prior progress in other CMS programs. A targeted 30-day readmission intervention will proactively prepare the healthcare system to prevent cumulative penalties and help the healthcare system avoid a reactionary organizational stance after a combined significant payment reduction and readmission penalty.

In the initial assessment and planning of this quality improvement project, gaps in current practice were identified that led to readmission of patients with healthcare-acquired *Clostridium difficile*. Using data on the current cohort of CMS 30-day readmission penalty conditions (congestive heart failure, acute myocardial infarction, chronic obstructive pulmonary disease, and pneumonia), correlations were made with healthcare-acquired *Clostridium difficile*. A retrospective chart review of first-quarter 2015 patients (N = 13) who readmitted within 30-days after their initial hospitalization and were diagnosed with healthcare-acquired CDI revealed several commonalities (see Appendix K for a gap analysis).

Patients who were readmitted within 30 days from their initial discharge were placed into five general categories using the retrospective chart review (see Appendix L). The categories (n = 42) are listed in numerical order, large to small: (a) medication adherence/side effects (n = 5);

(b) *Clostridium difficile* complications (e.g., dehydration, nausea, increased abdominal pain, fevers, increasing diarrhea; $n = 4$); (c) severe sepsis/sepsis ($n = 3$); (d) prescribed antibiotic for *other* infection that caused *Clostridium difficile* reoccurrence ($n = 2$); and (e) treatment failure ($n = 2$). These cases did not include those patients seen in the emergency department only.

The findings were consistent with current literature related to the causes of 30-day readmissions driven by *Clostridium difficile* (Elixhauser, Steiner, & Gould, 2012). Medication management and side effects led the causes identified in this initial group of patients who readmitted. This was a logical finding considering several patients were diagnosed later in their initial hospital stay. The use of antibiotics (self-care activity) in the home environment would likely continue for up to a week and a half depending on the date of discharge. Other categories of causes were identified as symptom recognition, self-care activity, and healthcare provider interaction when following up with primary care providers.

The assessment of the nurses prior to the intervention identified knowledge deficits among the nurses as well as gaps in patient teaching. The knowledge deficits were in relation specifically to healthcare-acquired CDI. Nursing staff were teaching a small core of topics (hand washing, antibiotic use, post-acute care follow-up, and family needs) without understanding that other concepts were missing in the discharge education process. Nursing staff reported using the teach-back method but were often concerned about the patient's ability to recall the information specific to *Clostridium difficile* and not preventive measures to inhibit infection.

Having identified a knowledge deficit specific to nursing understanding related to healthcare-acquired CDI, a targeted educational program aimed at ameliorating these gaps in knowledge was undertaken. The educational content built upon previous foundational common

knowledge related to CDI with the incorporation of new content specific to CDI reoccurrence and causes of hospital readmission specific to CDI.

Methods of Evaluation

The study of anticipated outcomes of this project focused on three specific outcome measures to identify the decrease in numbers of readmissions related to healthcare-acquired CDI. The first outcome measure was identifying nursing compliance with documenting usage of the improved written patient discharge educational sheet from the nursing documentation notes, thus confirming that the nurses provided the improved patient education intervention. The electronic healthcare record would provide verification that the nurses delivered the healthcare-acquired CDI-specific education and the compliance rate would be ascertained by comparing the number of times patient education was given by the nurses to the number of patients with healthcare-acquired CDI who were discharged.

The second outcome measure was the number of patients from the intervention unit who returned to the emergency department (ED) within 30-days from discharge with a diagnosis of healthcare-acquired CDI that were evaluated, treated and discharged from the ED without being readmitted. A systematic ED chart review would provide the information related to these return visits, specifically a diagnosis code of CDI and documentation in the ED history and physical indicating symptomology consistent with healthcare-acquired CDI.

Finally, the third outcome measure similarly focused on the number of patients who were evaluated and readmitted from the ED within 30-days from discharge from the intervention unit with a diagnosis of healthcare-acquired CDI. These patients were readmitted directly from the ED into the appropriate patient care unit necessitated by their acuity and comorbidities. No patients were readmitted directly into the in-patient units from primary care MD offices. Again, a

systematic review of patients discharged within the previous 30-days would provide this identifying information obtained through a subsequent chart review and diagnosis code of CDI. A comparison of readmissions from the ED and intervention unit three months prior to the education intervention would be compared to the post-intervention readmissions from the selected areas to identify any change in rate of readmissions.

Using the facility's electronic medical record, the DNP student collected and quantified the percentage of patients who had the enhanced healthcare-acquired CDI education as documented by a specific nursing note. The note contained a brief description of the patients appropriate ability to engage in teach back methodologies, key content covered in the education (CDI pathogen, self-care activity, medications and symptom tracking to identify reoccurrence). This note was consistent with the nursing requirements of the healthcare facility as detailed in the nursing policies specific to patient education and required documentation.

Daily rounding by the DNP student on the unit allowed for an informal "patient education progress measure" specific to achieving the goals of enhanced discharge patient education for healthcare-acquired CDI education. Findings obtained from daily discussions with primary care nurses were documented and then discussed with the QIT at regularly scheduled meetings or via e-mail if it was an urgent matter. Outcomes and barriers to achieving the defined measures were reported at scheduled meetings with members of the QIT.

Analysis

Microsoft Excel was the primary application used for data collection and analysis. Medical records determined patient activity within the 30 days after discharge as shown in the global medical record. De-identified data was extracted from patient medical records and

entered into the spreadsheet. Nursing education compliance was documented on the master tracking tool under a specific checkbox on the excel data collection spreadsheet.

SECTION IV: RESULTS

Program Evaluation

The quality improvement objective was a 10% reduction of 30-day readmissions related to healthcare-acquired *Clostridium difficile* in the 90-day assessment period specific to the selected intervention unit. The first quarter baseline rate representing the prevalence of 30-day healthcare-acquired CDI readmissions for the selected unit prior to the quality improvement intervention was a total of 42 patients discharged with 13 readmitting for a readmission rate of 36%. The ED 30-day evaluation rate for the mixed medical/surgical unit before the educational intervention noted 2 patients out of 42 for a rate of 5%.

Following the 90-day quality improvement intervention, the 30-day readmission rate of healthcare-acquired CDI for the mixed medical/surgical unit had fallen from 36% to 14% (9 readmits out of 66 discharges) for a decrease of 61%. However, the 30-day return rate for ED evaluations of healthcare-acquired CDI increased to 7 ED patients out of 66 discharges for an intervention rate of 11%, which is an increase of 250% from the first quarter baseline rate. This finding requires further evaluation.

Initial results of the project showed demonstrable evidence of decreased 30-day healthcare-acquired CDI readmissions following the enhanced discharge education for the 30-day inpatient readmissions. Considering the observed results of reduced 30-day CDI readmissions, it is plausible that a sustained trend of decreased CDI readmissions would

continue. Given that no data explicit to this intervention were previously gathered, the full extent of cost effectiveness remains to be seen.

Patient's medical records were audited for compliance with the proposed enhanced patient discharge teaching. The electronic medical record (EMR) contains a check-box type indicator that is selected by the nurse after completing patient discharge teaching/education. This method revealed a compliance rate of 88% (37 completed out of 42 patients) before the intervention and 97% (64 completed out of 66 patients) after the enhanced discharge education. Specific nursing notes in the EMR detailing enhanced healthcare-acquired CDI patient education measures reached a compliance rate of 90% (60 out of 66 total patients) throughout the proposed intervention period (90-days).

The mixed-specialty medical/surgical unit had an observed rate decrease specific to healthcare-acquired 30-day readmissions of 61%. The quality improvement project had an initial aim of reducing 30-day healthcare-acquired CDI readmissions by 10% as previously noted. A higher than expected decrease in 30-day healthcare-acquired CDI readmissions was achieved in the assessment period following the intervention with the enhanced discharge material (see Appendix N). The pre and post-intervention data in appendix N highlights discharge dispositions into the post acute care settings with a focus on 30-day readmissions and 30-day ER return visits.

The quality improvement project consisted of implementation of evidence-based enhanced patient-discharge education material with the objective of preventing 30-day readmissions, 30-day ER return rates and improving the overall content knowledge of nursing and healthcare-acquired *Clostridium difficile* patients. The inpatient medical/surgical unit selected for this project was appropriate for the intervention implementation because the selected

unit had the highest numbers of healthcare-acquired *Clostridium difficile* patients in the healthcare system. The organization supported this improvement work: Maintaining low 30-day readmission rates is a strategic goal of the healthcare system.

SECTION V: DISCUSSION

Summary

Analysis of data collected in the 90 days following the intervention period showed positive measurable results in preventing 30-day readmissions of the healthcare-acquired *Clostridium difficile* patient cohort. Nurses reported greater awareness of the local epidemiology of CDI and the implications of healthcare-acquired CDI for patient readmissions. Nurses additionally indicated they were better prepared to provide CDI patient-discharge education following the educational intervention and use of targeted discharge material. Additionally, patients and their caregivers expressed satisfaction with the increased content in the patient-specific handout, compared to the content in the previous generic handout provided before the targeted intervention.

Additional findings showed nursing staff proactively initiated the discharge instructions before the day of discharge—nurses considered the content applicable during the inpatient setting. Nursing staff reported through post-intervention surveys that patients were asking more pertinent questions related to self-care activity and reported greater satisfaction with the enhanced discharge education content compared to the standard healthcare-acquired *Clostridium difficile* patient handout.

Nursing staff reported via post-assessment survey (see Appendix O) that the quality improvement project increased nurses' understanding of healthcare-acquired *Clostridium difficile,* provided a clearer understanding of what material to focus on during the discharge

process, and ensured patients were better prepared before leaving the healthcare setting. Nursing staff reported via written commentary on the post-assessment survey that the enhanced CDI nursing education and increased daily interactions with the infection control nurses allowed for greater understanding of healthcare-acquired CDI, thus effectively closing the identified gap in nursing understanding and knowledge. Nursing staff additionally reported greater understanding of the importance of the teach-back method and its applicability to ensuring patients were better informed about their infections.

A best practice was identified from the intervention: When a new patient with healthcare-acquired *Clostridium difficile* was identified on the unit, nursing staff used the enhanced discharge education sheet in conjunction with the generic CDI information sheet to educate the patient earlier in the hospitalization process about the infection and the next steps to take in the home environment. Nurses reported the patient and family were more engaged because more time was available for questions and for the patient to develop a better understanding of the reasons behind the importance of the educational material. Nurses additionally reported on the survey that direct caregivers were better prepared to assist the patient in the post-acute care setting regarding *Clostridium difficile.*

One finding that requires further investigation is the observed increase in healthcare-acquired CDI patients seeking evaluation in the emergency department within 30-days from the date of discharge from the intervention unit. The medical record revealed that an increased patient census occurred during the intervention period, which may reflect a normal 30-day ED return rate for the given volume of patients. However, the 30-day ED return rate may be due to various factors such as (a) patients self identifying healthcare-acquired CDI reoccurrence symptomology in the home setting and seeking care earlier or (b) patients without access to

primary-care providers comprised greater numbers in this evaluation cohort and thus returned to the ED for follow up as directed per the enhanced healthcare-acquired CDI discharge education. While positive, these findings are multifactorial and require further investigation that is beyond this improvement intervention. Continued data collection and monitoring of this result will require further evaluation to determine if the observed increase of patients returning to the ED within 30-days is a direct result of this quality improvement intervention or is a normal variation indicative of healthcare-acquired CDI patients.

The innovative quality improvement project undertaken by the DNP student proactively advanced the healthcare facility ahead of the CMS healthcare-acquired *Clostridium difficile* 30-day readmission penalties. The quality improvement project solidified the benefits of organizations supporting doctorally prepared nurses in the acute care settings. The DNP student was able to utilize evidenced-based literature specific to the intervention, thus effectively changing nursing practice to bring about positive, measurable results that have implications within and beyond the healthcare system.

SWOT analysis. The well-known strengths, weaknesses, opportunities, and threats (SWOT) analysis tool utilized post-intervention for this quality improvement project (see Appendix M). The main strength of this quality improvement project was that no additional financial support or hiring of staff members was required to implement the identified intervention. The intervention was intended to improve patient health and wellness while improving nursing knowledge specific to healthcare-acquired CDI discharge education.

A weakness of the intervention was the fact that the patient population comprised a majority of homeless or underserved who were at risk of 30-day readmissions despite the tailored discharge education. This population may lack stable post-discharge housing and access to

communications and often have comorbidities that interfere with cognition or comprehension of material once self-care activity transitioned to their sole responsibility. Patients in this population may be discharged with medications but these are often stolen, lost, or compromised (ruined) because of patients' living conditions. Multiple demands placed on nurses at the time of discharge have the potential to disrupt the intervention by reducing the discharge education teaching time.

Opportunities provided by the intervention included those related to increasing RN knowledge about healthcare-acquired *Clostridium difficile* and increasing patient knowledge to prevent 30-day readmissions as evidenced in post-intervention assessment findings and associated data. Threats included (a) a lack of buy-in to the project by nurses, (b) patients not adequately assessed for education readiness prior to providing discharge education, (c) patients leaving against medical advice before receiving the appropriate discharge education, and (d) a high-risk patient population (homeless, lack of primary care access, multiple co-morbidities, and advanced age) that despite targeted discharge education will likely readmit within 30-days after discharge or return to the ED within 30-days as identified in the post-intervention period.

Return on investment. In order to influence key stakeholders' decision to invest in this particular quality improvement program, communicating the organizational benefits of the return on investment (ROI) and economic savings was vital to the success of the intervention. Present estimations of value can be used to identify the absolute value of costs related to an improvement program (Waxman, 2012).

Costs are classified into two categories: development costs and implementation costs. Development costs are incurred once in the life of a project and comprise the initial start-up funds. Implementation costs are commonly associated with the steps necessary to effect a

quality improvement project. Development costs included the DNP student's time spent researching literature and evaluating the current state of the problem, consulting with key stakeholders in the organization, consulting with physician leaders and experts in their respective fields for input, getting project approval, obtaining office supplies and associated materials, and printing surveys and project literature. Implementation costs included photocopying nursing surveys, implementing the quality improvement project, spending time on the selected inpatient care unit with nursing staff, and meeting repeatedly with stakeholders.

This quality improvement project contained process goals consisting of improved patient discharge education and 10% reduction of 30-day readmissions. The ROI analysis included the costs associated with the improvement intervention, the intervention outcomes, estimates of the value of the intervention outcomes, and data collection. The actual ROI numbers were based on an estimate of potential numbers of infected patients and potential readmissions using first-quarter 2015 data that were projected for an entire year (four quarters). The post-discharge planning of the project included patients who readmitted specifically within 30 days from the initial date of discharge. The ROI was then calculated using the estimated avoided costs of care associated with patient readmissions. Considerations for payment reductions related to healthcare-acquired infections and the 3% penalties imposed by CMS were not included in the ROI assumptions, because current data was unavailable (see Appendix I for the budget and ROI).

Relation to Other Evidence

Numerous researchers have evaluated the cause-and-effect relationships between patients and 30-day readmission rates post-acute care discharge. Patient readiness for discharge is influenced by many factors; however, the quality of discharge education is the strongest predictor of ensuring successful patient discharge and preventing 30-day readmissions (Knier,

Stichler, Ferber, & Catterall, 2015). In addition, decreased lengths of stay and increased complexity of patient care has created a more intricate and challenging patient discharge process (Knier et al., 2015).

Miller and Schaper (2015) found that uncoordinated transitions from the inpatient setting to the home environment created hardships for patients and families when a readmission occurred as a result of failed inpatient discharge processes. Miller and Schaper (2015) noted that complications that arose post-discharge were often preventable based on appropriate discharge education during the initial hospitalization (p. 64). Patients' inability to follow and adhere to post-discharge self-care instructions was the direct result of a lack of knowledge related to their level of understanding about their diagnosis and associated medications for the treatment of their conditions (Miller & Schaper, 2015).

Patients who received targeted discharge education about their conditions before the day of discharge fared better than did those patients whose discharge education occurred the day of discharge (Koehler et al., 2009). Koehler et al. (2009) reported an additional risk factor for 30-day readmission was a patient having five or more medications at the time of discharge. Additionally, interventions that maintained lower rates of 30-day readmissions used targeted discharge education for specific conditions, thus allowing greater patient self-care and family participation (Koehler et al., 2009).

A common theme in the literature focused on patient anxiety as a barrier to learning and participating fully in the discharge education (Koehler et al., 2009). Patients' anxiety was reduced when nurses spent more time educating patients and appeared engaged and present in the process of patient education (Koehler et al., 2009). Thus, being *engaged and present* is a critical educational component for nurses to master, despite their work in a busy medical/surgical

inpatient care unit. Patients' perceptions of nurses being rushed for time can lead to disengagement from the discharge teaching process (Koehler et al., 2009). Current literature specific to CDI and nursing considerations has shown improved patient care outcomes when nurses provide targeted CDI education (Mitchell, 2014).

Barrier to Implementation and Limitations

Several barriers were encountered during the quality improvement intervention. The DNP student was initially skeptical of obtaining nurses' buy-in to the improvement intervention because five back-to-back competing organizational quality projects rolling out system-wide were projected to continue through the remainder of 2015. Nursing managers reported these high-reliability quality programs created competing challenges in implementation and sustainability, requiring education and successive implementation of the programs. In addition, staff championing was expected to influence nurses' buy-in.

Barriers to discharge education initially were identified related to the use of computer-generated, disease-specific, patient-discharge education for healthcare-acquired *Clostridium difficile* patients. Multiple sources existed by which nursing staff could obtain discharge education materials in different formats. Several contained only written content, lacking graphics that could emphasize pertinent educational content and potentially alert patients to the importance of some instructions. Other educational content had graphics but because of the inability to print in color, the color-coded graphics were unusable.

Nurses identified premature patient discharges as a barrier to implementation, noting that in an effort to create available inpatient beds, some healthcare-acquired CDI patients were discharged earlier than planned. Continued communication breakdowns between rounding medical staff (residents and attending physicians) and nurses represented an additional barrier in

providing discharge education for patients. Nursing staff stated that despite team rounds, they were often unavailable for participation because of competing patient care priorities. Thus, they often missed pertinent information specific to a patient's clinical progression to discharge. The barriers impeding an effective discharge process identified by nursing staff were similar to barriers reported in the literature (Wong et al., 2011).

Several nurses indicated on the post-assessment survey that the length of patient discharge specific to healthcare-acquired CDI was exceeding 30 to 45 minutes in duration. Patients were engaging more actively and asking more probing questions of nurses related to self-care activity in the post-acute care setting. One overarching theme identified from surveyed nurses' data involved patients who were visibly concerned about CDI reemergence following the completion of initial antibiotic therapy. Further, nurses indicated several patients had difficulty understanding the pathology of CDI; antibiotic therapy to these patients meant the infection was cured.

To ease patient anxiety as reported in the literature and close the gap between written instructions and patient understanding, a color-coded symptom indicator was designed (see Appendix P). This color-coded symptom indicator tool was presented to five patients for feedback. Patients reported easier understanding of CDI discharge self-care activity, greater understanding of CDI symptoms, and greater knowledge of the elements needed to communicate with healthcare providers after discharge. As of this writing, the tool had not been approved for use in the local system, and thus was submitted for approval for future inclusion into the current master educational patient education handouts.

Interpretation

This quality improvement project--constructed from and implemented based on foundational evidence from the literature--was found to positively affect (decrease) 30-day healthcare-acquired CDI readmissions on the selected mixed-specialty medical/surgical unit. This project is expected to expand throughout the test facility. After full implementation at the test facility, a coordinated rollout to the other three healthcare facilities in the system will follow. In addition, findings from this project will be shared with the larger corporate organization for potential implementation across the 25 affiliated hospitals. This project not only aligned with the local healthcare system's goals related to reducing 30-day readmissions, but it also aligned with the goals of the corporate office. Decreasing 30-day readmissions specific to healthcare-acquired CDI provides protection against lost revenue from payment reductions attributable to healthcare-acquired infections, 30-day readmission penalties, and patients unnecessarily filling inpatient beds for extended lengths of stay because of complication-related readmissions. Moreover, patients will avoid unnecessary financial expenditures related to repeat hospitalizations.

Conclusions

The success of this quality improvement project, which achieved a reduction in 30-day readmissions for healthcare-acquired *Clostridium difficile* patients, occurred because of the direct support from bedside nursing staff who considered this project meaningful to patients' health and well-being. These nurses viewed this project as a value-added component of the nurses' discharge teaching process. In keeping with the mission of the healthcare organization, this quality improvement project directly supports the organizational pillars of quality, safety, reliable care, and cost-effective care. By reducing 30-day readmission penalties, the healthcare

system has more capital available to reinvest. Most important, this project helps drive the organizational mission of providing high quality, safe patient care.

The DNP student's work on the reduction of 30-day hospital readmissions is the capstone of a decades-long journey in nursing education. This project required the ability to draw upon a complex and vast array of resources involving patient-care improvement, a focus on the work environment of nursing professionals, and the establishment of fiscal responsibility in one of the largest healthcare systems in the city of San Francisco, California. Most important, this intervention enhanced the spiritual, physical, and holistic well-being of patients and their families. This DNP capstone project epitomizes the University Of San Francisco's motto, *Change the world from here.*

SECTION VI: OTHER INFORMATION

Funding

There was no identified need for funding of this quality improvement project. The healthcare facility selected core goals based on the economic impact on the healthcare institution. The costs of this program were folded into current organizational positions held by people whose focus was on reducing 30-day readmissions in the following year's annual budget.

SECTION VII: REFERENCES

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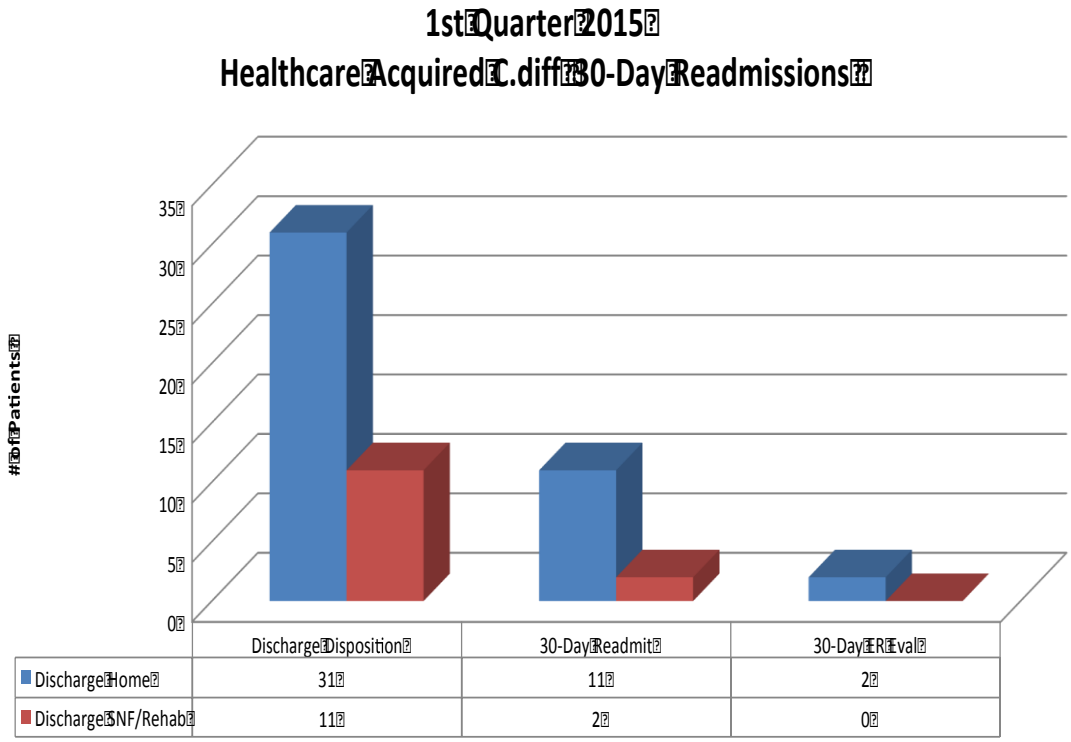
Appendix A – *Clostridium difficile* 30-Day Readmissions



Appendix B – Evidence Table

Evidence Table

Number:	Author / Date:	Evidence Type:	Sample Size	Findings:	Evidence Level:
1	Dubberke et al. (2014)	Clinical Practice Guidelines	N/A	ICD-9 classification revealed rates of hospital acquired CDI more than doubled between 2000 and 2009, reaching all time historic levels. Numerous reports of increasing CDI severity and incidence of severe disease. HA-CDI patients are more than twice as likely to be discharged to SNF or long term care due to debilitating disease process. Provision of education materials for patients, family and healthcare personnel that include explanations of CDI and importance of transitional care follow up.	4B
2	O'Brien (2007)	Non-Experimental	3,692 patients	Epidemiologic surveillance demonstrates a 0.5% - 1.5% CDI rate of infection of all patients admitted to hospitals. Rate of hospitalization for CDI in 1980 was 1.4 patients per 1000,000 persons. Between 2003 and 2004 the rate of CDI increased by 25% of between 4000,000 - 500,000 new cases of infection. C.Difficle carries a reoccurrence rate of between 20%- 66% after initial antibiotic treatment. This cohort had a 14% readmission rate (455 patients) readmitted within two years. 424 patients had a first year readmission rate of 13%.	3A
3	Paranvi et al. (2010)	Non-Experimental	N=669 patients	90 day observational study evaluating the number of patients readmitted with any healthcare acquired infection. The authors found that 114 (14.8%) of patients readmitted had a healthcare acquired infection as primary cause of admission. Medicine was the main discharging specialty with a return rate of their population of 35.1%. The median readmission time was 8.4 days after discharge with an average secondary hospital stay of 7.35 days. C.Difficle was the primary driver for 5 patient admissions compromising a 8.1% readmission rate for the observation period.	3B

4	Jarvis et al. (2009)	Non-Experimental	N=648 persons surveyed. Patient population of 7,000+	Overall C.Difficle prevalence in the US healthcare facilities on a daily basis is 20% of the entire population (13.1 per 1,000 patients). This was found to be 6.5 to 20 times higher than previous incidence estimates. Out of 12.5% of all US hospitals the authors noted 7,178 CDI cases present on any 1 day and 301 would die out of this cohort daily. Focus on comprehensive controls to prevent CDI acquisition in the healthcare setting.	3A
5	Murphy (2012)	Non-Experimental	170,995 patient Readmissions	Authors noted that readmission HAI has not been well studied compared to other readmission conditions. HO-CDI may bot be apparent until weeks after the initial hospitalization based on an average inpatient stay of 3-5 days. Patients remain at risk for 90 days post discharge form the index hospitalization. Of those patient s who developed CDI within 100 days post discharge, 89% developed CDI within 60 days and 85% occurred within 30 days. This study found that the risk of readmission was highest for the initial four weeks post discharge.	3A
6	McHugh (2013)	Non-Experimental	70,000 patients	This study evaluated readmissions using Medicare data in current readmission conditions (CHF, Pneumonia, and MI) form California, New Jersey, and Pennsylvania. This study found that improving nurses working environments improved readmission rates by allowing proper discharge teaching and provided the ability to better manage patients care transitions into the post acute care environment.	3A

7	Dubberke et al. (2014)	Non-Experimental	3,958 Patients	This retrospective cohort study examined the attributable costs to recurrent CDI. This study found that reoccurrence occurred within 42 days post last day of initial treatment. HA- CDI patients who had a recurrent episode were 12.5 times more likely to acquire readmission costs due to being readmitted than those whom did not have a recurrent episode of care. the attributable inpatient cost was $15,000, not accounting for the indirect costs patients are subjected to in terms of after care and continued costs for treating CDI in the post acute care setting.	3B
8	Gerhardt et al. (2013)	Non-Experimental	700,000 patient admissions	This study used unadjusted publically reported Medicare data to CMS to evaluate readmission rates of all chronic conditions not including healthcare associated infections. The authors noted using 2012 data that all cause readmission rates remain stable at 19%. The authors caution however that admissions during this time also decreased, which has been occurring since 2007. The authors indicate that lower readmission rates since 2012 may be tied to improved initiatives aimed at reducing 30-day readmissions.	3A
9	Argamany (2015)	Non-Experimental	2.3 million patient discharges	This study examined retrospective cohort data on all discharged patients from US hospitals between 2001 - 2010. The study found regional variations in C.Difficle which occurred across the US. The study found that older adults had on average a 3x incidence rate compared to younger adult rates. C.Difficle incidence was found to be highest in the Northeast and lowest in the West. The authors believe regional differences may be tied to antibiotic prescribing patterns that coincide with seasonal changes in these regions. Northeast regions had longer average lengths of stay at 5.5 compared to the West at 4.4 days. It was noted that C.Difficle peaks in the spring time and is lowest during the fall months.	3A

10	Whitaker (2007)	Case Study	25 Patients	This case study looked at the the DNA of positive C.Difficle cases in a 469-bed tertiary facility to identify if the strains were identically same using bacterial DNA sequencing. The case study found that horizontal control methods helped reduce environmental transmission. The authors developed an enhanced patient education tool for use in the healthcare facility to guide patient/family teaching regarding CDI and found this intervention of value.	5B
11	Jack et al. (2009)	Experimental Study	749 Patients	This randomized trial of patient groups was undertaken to identify if patients receiving targeted discharge education faired better than those using traditional discharge methods on 30-day readmission rates. Participants in the intervention group (n=340) had a lower rate of post discharge healthcare utilization than those patients who received regular discharge teaching (n=368) (0.314 vs. 0.451 visit per person per month; incidence rate ratio, 0.695 [95% CI, 0.515 to 0.937]; *P*=0.009). A statistically significant findings was noted on those patients whom had enhanced discharge education reported seeing their PCP within the 30-day discharge window for follow up care compared to the control group. The implications of this is that those patients whom had follow up had lower rates of readmission. However, there are variables to this as lack of PCP, etc., to account for.	1A
12	Collins (2015)	Non-Experimental	7,564 patients	This study evaluated a random sampling of 5% of Medicare data on hospitalized patients. This study looked at the different classifications of CDI. Those patient whom survived their initial hospitalization were considered at risk for hospitalization related to CDI. Of the 3,032, 546 records, 864,904 met eligibility criteria for Medicare coverage. 8,465 patients were hospitalized with CDI of which 7,564 survived to discharge. 718 patients were readmitted with CD within the study period. The study found 29% of patients were readmitted within 14 days of discharge.	3A

13	Chopra et al. (2015)	Non-Experimental	51,353 discharged patients.	The authors of this study attempted to identify the burden of CDI on 30-day hospital readmissions at a tertiary healthcare-system. The authors noted 615 patients were discharged with CDI (1%). Thirty-day readmissions were more common among CDI discharges (30.1%) than non-CDI discharges (14.4%). Average length of stay was noted to be longer at 6 days than non CDI patients. Time to readmission was shorter and is reflective of other studies looking at this cohort.	3B
14	Zilberberg (2015)	Meta-Analysis of RCT	287 Patients	This study evaluated prior literature and considered only those patients whom had an ICU stay with certain defining factors. Those patients whom had antibiotic exposure were more likely to be readmitted than those with limited antibiotic treatment (84.2% vs. 94.8%, *P*=.004). CDI was found to be the strongest predictor of readmissions within 30-days. More than 25% of ICU patients with CDI were readmitted within 30-days of discharge.	3B
15	Olsen (2015)	Non-Experimental	3,950 patients with CDI including 413 patients whom were readmitted.	Retrospective cohort study using EMR data retrospectively. Patients were followed for 180 days post discharge to determine the patients whom were readmitted. The study found that patients whom had recurrent CDI on the index hospitalization were more likely to have at least 1 readmission within the study time period (85% vs. 41%; *P*=.001) for those patients whom had recurrent CDI.	3B
16	Yanke et al. (2015)	Quasi- Experimental	288 Patient/Healthcare worker observations	This prospective cohort study evaluating healthcare providers actions between two hospitals in the care of CDI patients. The authors found low compliance with horizontal infection control measures that are the current standard of care nationally. Compliance was 7% at hospital A and 22% at hospital B (*P*=.004). This study highlights the risk of patients contracting HA-CDI due to multiple failures in the healthcare environment.	2B

17	Zander (2014)	Expert Opinion	N/A	Readmission penalties are increasing annually up to 6% for selected conditions by CMS. The author advocates for acting proactively on CMS readmissions to be ahead of the curve to bette prepare the organization. Enhancing patient discharge education to provide a smoother care transition. Identify high risk patients that will require further care services in the discharge environment.	5B
18	Elliott (2014)	Systematic Review	N/A	The authors undertook an extensive literature review to identify readmissions into the ICU. This study noted that Sepsis was the second most common cause of ICU readmission. Considering the constellation of CDI, sepsis is a defining characteristic of the disease process and has not traditionally been evaluated in terms of readmission causes. The authors Implicated C.Difficle as a potential factor of ICU readmissions.	4A
19	Elixhauser (2012)	Organizational	N/A	This review of of 30 and 90 day readmission noted that 30-day readmissions was highest amongst Medicare patients at (14.1%) compared to uninsured at 7%. The authors noted that on average those patients with more severe of complicated causes of CDI were discharged into long term care facilities on average of 45% more frequently, and these patients had higher readmission rates of 49% compared to other cohorts. This belief is that due to severity, the more sever the CDI, the greater risk of incurring a 30-day readmission despite continuing healthcare.	5A

20	KripLni (2007)	Qualitative		This study looked at patient perceptions of care transitions during their hospital discharge. The authors found on average patients expressed difficulty with understanding discharge education when considering medications, follow up appointment with providers, self care activities and how to complete these activities. Most importantly was medications that were changed at time of discharge. Patients had difficulty recalling the medications they were to take and at what times, what medications had been discontinued and which medications had been adjusted in terms of dosage when two of the same medications were present.	5A

Appendix C – USF Project Approval

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DNP Project Approval Form: Statement of Determination

Student Name: Keith Howard

Title of Project:

Preventing 30-day readmissions of Clostridium difficile patients utilizing targeted discharge instructions.

Brief Description of Project:

Clostridium difficile is now the most prevalent healthcare associated infection reported to the Centers for Disease Control and Prevention (CDC) by acute care hospitals in the United States. Beginning fiscal year 2015, Centers for Medicare and Medicaid Services implemented the Hospital-Acquired Condition (HAC) Payment Reduction Program, penalizing low performing hospitals with a 1% penalty on inpatient Medicare reimbursement.

Beginning fiscal year 2017, *Clostridium difficile* will be added to the payment reduction program. This creates a "Double Strike Penalty" for healthcare institutions as penalties under the value based readmission program (VBP) and the HAC program combine to increase the overall penalty. Worst-case scenarios for healthcare facilities are the "trifecta CMS penalties" with the addition of the in-patient prospective payment program (IPPS) increasing Inpatient Medicare payment reductions from 1% up to 6%.

Traditional discharge education for high risk patients has typically focused on quality core measures aimed at reducing readmissions in relation to these publically reported metrics (CHF, AMI, etc.). Patients who develop *Clostridium difficile* hospital-acquired infections receive generalized discharge education related to aspects of self-care, limited antibiotic medication adherence, home environment cleaning and no other pathogen specific nuances of self care related to *Clostridium difficile*.

Clostridium difficile discharge education primarily begins the day of discharge and concurrently competes with additional educational components, prescribed medications for home and follow up instructions. Delivery of aftercare instructions often fails to assess the patient's true understanding of the material in addition to comprehension of what was educated too.

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A) Aim Statement:

Two competing causes of hospital readmissions related to *Clostridium difficile* are 1) lack of understanding related to general self care activity when infected with *Clostridium difficile*, and 2) Reoccurrence of *Clostridium difficile* related to disease process or improper care transitions into outside healthcare services. This project seeks to improve discharge education to prevent hospital readmissions.

B) Description of Intervention:

Two groups of patients will be educated prior to discharge and tracked for 30 days from the date of discharge. The first group will be educated using the current education instructions generated at the time of discharge. The second group will receive enhanced educational material prior to discharge. Both groups will be tracked post discharge to identify which patients are evaluated in the emergency department for *Clostridium difficile specifically* or are readmitted to an inpatient unit within the 30 day time period.

C) How will this intervention change practice?

By enhancing discharge education material related to healthcare onset *Clostridium difficile* the goal is have no 30 day readmissions amongst this cohort.

D) Outcome measurements:

Tracking of 30-day readmission and 30-day ER return rate by diagnosis.

Tracking 30-day readmission and 30-day return rate by timeframe.

Pre and Post nursing knowledge assessment of enhanced *Clostridium difficile* discharge education intervention.

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used:
(http://answers.hhs.gov/ohrp/categories/1569)

☑ This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Student may proceed with implementation.

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☐This project involves research with human subjects and must be submitted for IRB approval before project activity can commence.

Comments:

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

Instructions: Answer YES or NO to each of the following statements:

Project Title: *Preventing 30-day readmissions of Clostridium difficile patients utilizing targeted discharge instructions*	**YES**	**NO**
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	X	
The specific aim is to improve performance on a specific service or program and is **a part of usual care**. ALL participants will receive standard of care.	X	
The project is **NOT** designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does **NOT** follow a protocol that overrides clinical decision-making.	X	
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does **NOT** develop paradigms or untested methods or new untested standards.	X	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does **NOT** seek to test an intervention that is beyond current science and experience.	X	
The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.	X	
The project has **NO** funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	X	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., **not** a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	X	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: *"This project was undertaken as an Evidence-based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board."*	X	

ANSWER KEY: If the answer to **ALL** of these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research.

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IRB review is not required. Keep a copy of this checklist in your files. If the answer to ANY of these questions is **NO**, you must submit for IRB approval.

*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.

STUDENT NAME: Keith Howard

Signature of Student: _____ **DATE** 5--

SUPERVISING FACULTY MEMBER: Dr. Tim Godfrey

Signature of Supervising Faculty: _____ **DATE** 5/19/15

Appendix D – Sutter IRB Exemption Approval

Sutter Health Institutional Review Board
2200 Webster Ave., 5th Floor
San Francisco, CA 94115
415.600.3686 Tel 415.600.1753 Fax

DATE:	June 13, 2015
TO:	Keith Howard, DNPc, MSN, Principal Investigator
FROM:	Sutter Health Expedited Review Panel
PROJECT TITLE:	[754412-2] Preventing 30-day readmissions of Clostridium difficile patients utilizing targeted discharge instructions.
SHIRB #:	2015.049EXEMPT CPMC (KHow)
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF NOT RESEARCH

On June 13, 2015, the Sutter Health IRB determined this project does not meet the definition of research at 45 CFR 46.102(d) or clinical investigation at 21 CFR 56.102(c).

Further IRB review of this project is therefore not required.

Please be advised that this determination is based on the submitted documents. Changes to the project may bring it under the definition of research. You are therefore advised to check with the IRB office prior to implementing any such changes.

The IRB will retain a copy of this correspondence.

If you have any questions, please contact the IRB Office at (415)600-3686 or email SH-IRB@sutterhealth.org. Please include your project title and SHIRB reference number in all correspondence with the IRB Office.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Sutter Health Expedited Review Panel's records.

CPMC
Sutter Health

California Campus
3700 California Street

Pacific Campus
2333 Buchanan Street

Mailing Address
P.O. Box 7999
San Francisco, CA 94120
(415) 600.6000

Davies Campus
Castro & Duboce Streets

St. Luke's Campus
3555 Cesar Chavez Street

May 6, 2015

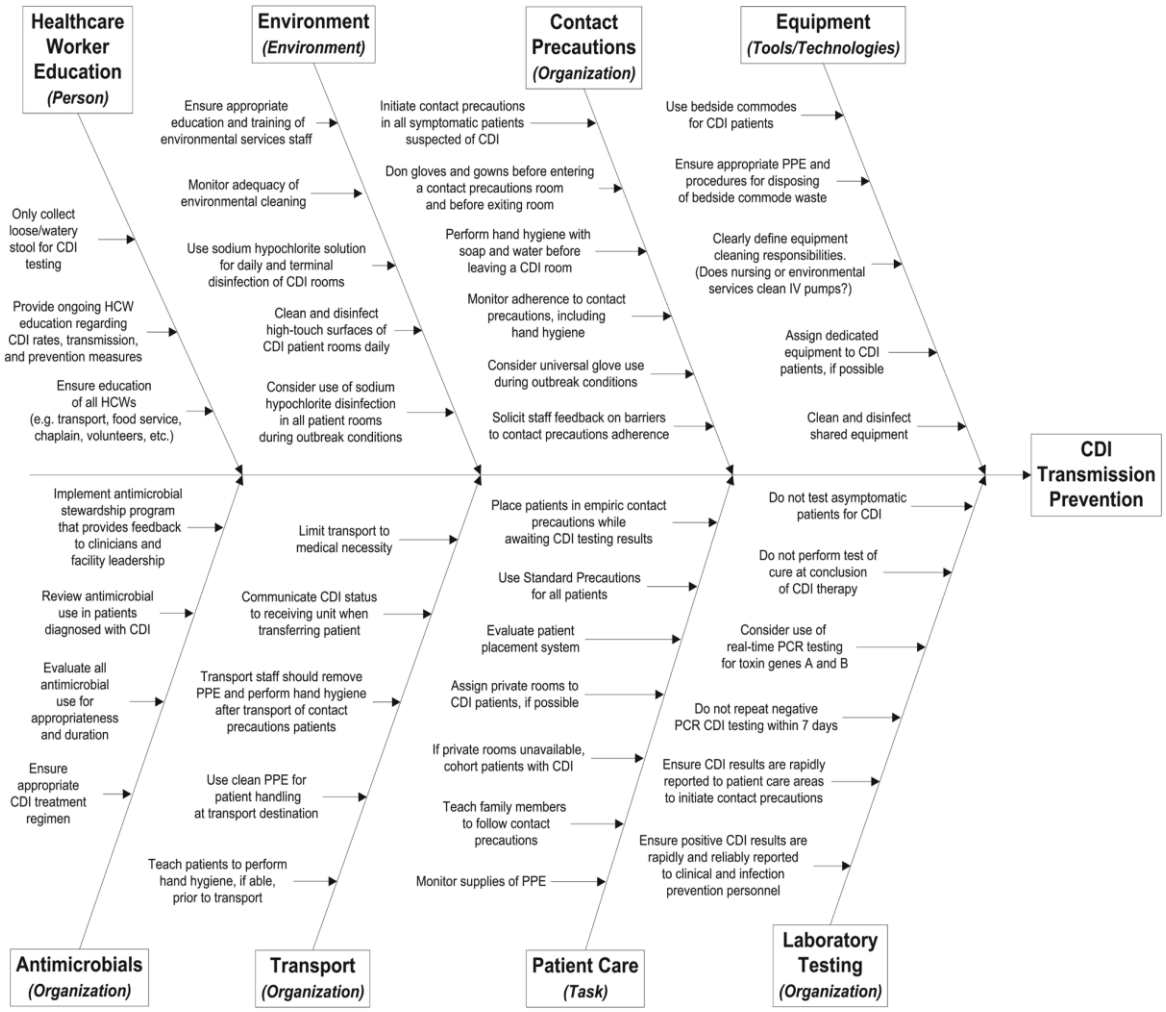
To Whom It May Concern:

This letter is in support of Keith Howard's graduate course work at California Pacific Medical Center. The proposed project entitled ***Preventing 30-day readmissions of Clostridium Difficile patients utilizing targeted discharge instructions*** has been reviewed. It has been approved for implementation within the system. If you have any questions, please contact me at the number below.

Respectfully,

Karen Anderson, MT, MPH
Manager, Infection Control

Appendix E – CDI Transmission Prevention Fishbone



Appendix F – Nursing Pre-Assessment

Nursing Questionnaire
C.diff Discharge Education

1. Do you feel that current discharge instructions are sufficient for patients with C.diff?

2. Can you recognize when a patient is on tapered antibiotic treatment for reoccur C.diff infection?

3. What patient discharge education do you provide at discharge for patients with C.diff?

4. Do you use the teach back method of assessment when providing C.diff education?

5. Are there any resources you use to enhance C.diff education during discharge?

6. What specific concepts of self care are discussed (i.e. bathing, HH, etc)?

7. How do you educate to antibiotics on discharge for C.diff?

8. Do you talk about what to do post discharge practices related to sharing bathrooms or how to clean?

9. What if any information do you tell the patient regarding follow up or when diarrhea begins?

10. How do you teach the patient to recognize C.diff recurrence?

Appendix G – Patient Education Material

FAQs
(frequently asked questions)

about

"Clostridium Difficile"

What is Clostridium difficile infection?

Clostridium difficile [pronounced Klo-STRID-ee-um dif-uh-SEEL], also known as "*C. diff*" [See-dif], is a germ that can cause diarrhea. Most cases of *C. diff* infection occur in patients taking antibiotics. The most common symptoms of a *C. diff* infection include:

- Watery diarrhea
- Fever
- Loss of appetite
- Nausea
- Belly pain and tenderness

Who is most likely to get C. diff infection?

The elderly and people with certain medical problems have the greatest chance of getting *C. diff*. *C. diff* spores can live outside the human body for a very long time and may be found on things in the environment such as bed linens, bed rails, bathroom fixtures, and medical equipment. *C. diff* infection can spread from person-to-person on contaminated equipment and on the hands of doctors, nurses, other healthcare providers and visitors.

Can C diff infection be treated?

Yes, there are antibiotics that can be used to treat *C. diff.* In some severe cases, a person might have to have surgery to remove the infected part of the intestines. This surgery is needed in only 1 or 2 out of every 100 persons with *C. diff.*

What are some of the things that hospitals are doing to prevent C. diff infections?

To prevent *C. diff.* infections, doctors, nurses, and other healthcare providers:

- Clean their hands with soap and water or an alcohol-based hand rub before and after caring for every patient. This can prevent *C. diff* and other germs from being passed from one patient to another on their hands.
- Carefully clean hospital rooms and medical equipment that have been used for patients with *C. diff*.
- Use Contact Precautions to prevent *C. diff* from spreading to other patients. Contact Precautions mean:
  - Whenever possible, patients with *C. diff* will have a single room or share a room only with someone else who also has *C. diff*.
  - Healthcare providers will put on gloves and wear a gown over their clothing while taking care of patients with *C. diff*.
  - Visitors may also be asked to wear a gown and gloves.
  - When leaving the room, hospital providers and visitors remove their gown and gloves and clean their hands.
  - Patients on Contact Precautions are asked to stay in their hospital rooms as much as possible. They should not go to common areas, such as the gift shop or cafeteria. They can go to other areas of the hospital for treatments and tests.
- Only give patients antibiotics when it is necessary.

What can I do to help prevent C. diff infections?

- Make sure that all doctors, nurses, and other healthcare providers clean their hands with soap and water or an alcohol-based hand rub before and after caring for you.

  If you do not see your providers clean their hands, please ask them to do so.

- Only take antibiotics as prescribed by your doctor.
- Be sure to clean your own hands often, especially after using the bathroom and before eating.

Can my friends and family get C. diff when they visit me?

C. diff infection usually does not occur in persons who are not taking antibiotics. Visitors are not likely to get *C. diff.* Still, to make it safer for visitors, they should:

- Clean their hands before they enter your room and as they leave your room
- Ask the nurse if they need to wear protective gowns and gloves when they visit you.

What do I need to do when I go home from the hospital?

Once you are back at home, you can return to your normal routine. Often, the diarrhea will be better or completely gone before you go home. This makes giving *C. diff* to other people much less likely. There are a few things you should do, however, to lower the chances of developing *C. diff* infection again or of spreading it to others.

- If you are given a prescription to treat *C. diff,* take the medicine exactly as prescribed by your doctor and pharmacist. Do not take half-doses or stop before you run out.
- Wash your hands often, especially after going to the bathroom and before preparing food.
- People who live with you should wash their hands often as well.
- If you develop more diarrhea after you get home, tell your doctor immediately.
- Your doctor may give you additional instructions.

If you have questions, please ask your doctor or nurse.

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SHEA The Society for Healthcare Epidemiology of America · IDSA · American Hospital Association · APIC Spreading knowledge. Preventing infection.™ · CDC Centers for Disease Control and Prevention · The Joint Commission

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Frequently asked questions about *Clostridium difficile* Infection (CDI)

What is *Clostridium difficile?*

Clostridium difficile [klo-STRID-ee-um dif-uh-SEEL] is a bacterium that causes diarrhea as well as more serious intestinal conditions such as colitis, an inflammation of the bowel.

What is *Clostridium difficile* infection?

Clostridium difficile is the most common cause of infectious diarrhea in healthcare facilities. The main symptoms include watery diarrhea, fever, and abdominal pain or tenderness. *Clostridium difficile* infection may occur as an undesirable consequence when antibiotics are taken to treat an infection. When treating that infection, some of your good bowel bacteria are also killed thereby allowing the bacteria that are not killed by the antibiotics to grow. One of these bacteria that are resistant to many antibiotics is *Clostridium difficile*. When *Clostridium difficile* multiplies, it produces toxins or substances that can damage the bowel and cause diarrhea. *Clostridium difficile* infection results in diarrhea requiring specific treatment and it can sometimes be quite severe. In severe cases, surgery resulting in removal of a portion of the intestines may be needed.

Who can develop *Clostridium difficile* infection?

Clostridium difficile infection, also known as CDI, usually occurs during or after the use of antibiotics. Those individuals having serious illness, the elderly, or those in poor general health are at increased risk of developing CDI.

How is *Clostridium difficile* infection diagnosed?

If you are on antibiotics, or have recently taken antibiotics, and you develop watery diarrhea and fever, your doctor may suspect *Clostridium difficile* as a cause of those symptoms. A sample of your stool (feces) will be collected and sent to the laboratory for analysis. The laboratory will test the stool to see if *Clostridium difficile* toxins are present. One or more stool samples may be collected.

How is *Clostridium difficile* infection treated?

Your doctor may prescribe a specific type of antibiotic that targets and kills *Clostridium difficile*. Treatment usually consists of antibiotics taken for about 10 days.

How do people get *Clostridium difficile* infection?

People in good health usually don't get *Clostridium difficile* infection. People who have other illnesses or conditions requiring prolonged use of antibiotics and the elderly are at greater risk of acquiring this disease. When a person has *Clostridium difficile* infection the germs in the stool can soil surfaces such as toilets, handles, bedpans, or commode chairs. When touching these items, the hands of the patient as well as the hands of the healthcare workers and family members can become soiled with *Clostridium difficile*. Those soiled items and hands can be involved in moving the organisms to other surfaces and other

people. This is why an individual with *Clostridium difficile* infection is placed in isolation when in a healthcare setting.

What type of isolation is used for *Clostridium difficile* infection?

If you have a *Clostridium difficile* diarrhea, you may be moved to a private room until you are free from diarrhea. Your activities outside the room will be restricted. Staff entering your room may wear a gown and gloves. Everyone **MUST** clean their hands after providing care to you or touching your environment. You should also pay attention to cleaning your hands regularly and showering or bathing to reduce the amount of bacteria on your skin. Your room will also be cleaned regularly and all equipment disinfected before it is removed from your room.

What should I do to prevent the spread of *Clostridium difficile* to others?

If you are infected you can spread to others. For safety precautions you may do the following to reduce the chance of spread to others:

- Wash hands with soap and water, especially after using the restroom and before eating.
- Clean surfaces in bathrooms, kitchens and other areas on a regular basis with household detergent/disinfectants

Should special practices be done when I go home?

Healthy people like your family and friends who are not taking antibiotics are at very low risk developing *Clostridium difficile* infection. However, it is prudent for everyone to clean their hands regularly and maintain a hygienic environment, especially the bathroom area. Cleaning of the environment can be done using your regular germicide or you can use a solution of chlorine bleach and water. If you use this solution, mix 1 part of chlorine bleach (unscented) with 9 parts tap water. Change the solution daily and be sure to protect yourself from splashes or sprays of the solution into your face and eyes. You might want to wear protective gloves to so the bleach solution does not come into contact with your skin.

What else should I know about cleaning the house environment?

Use clean cloth and saturate it with the germicide or bleach solution. Use friction when cleaning surfaces then allow the surface to air dry. If there is soil on the surface, remove it then use a new cloth saturated with germicide in order to disinfect the surface. Pay special attention to areas that may have come into contact with feces such as the commode and sink. When laundering items, rinse clothing or fabric that has been soiled with stool, and then use your regular laundry processes. Use the hot water cycle and detergent. If you want add some chlorine bleach that will assist with killing of the germs. Dry the items in the dryer. There is no need to initiate special precautions with dishes and eating utensils.

What about cleaning of hands?

Having clean hands is the most important thing any of us can do to prevent illness. When performing hand hygiene (another term for cleaning hands), it can be done using traditional soap and water

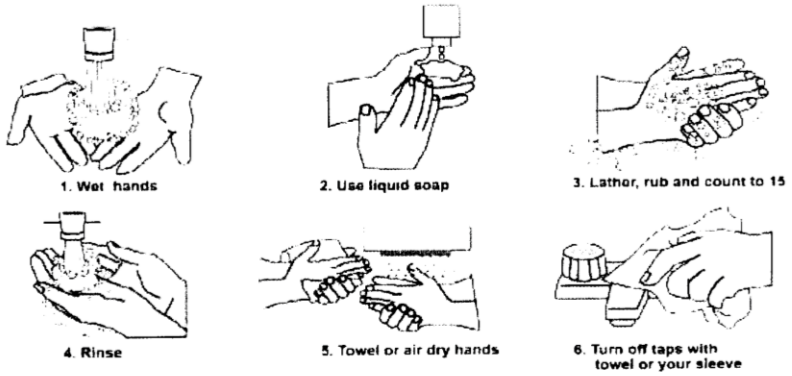
handwashing or using alcohol-based solution. Since *Clostridium difficile* is an organism found in feces, use of traditional handwashing is preferred. When washing your hands, first wet you hands with water then apply soap in the palm. Rub hands together taking care to cover all surfaces of the hands as well as between the fingers. Rub vigorously for at least 15 seconds, then rinse with water. Pat hands dry instead of rubbing as this may prevent damage to the skin of the hands and chapping. If alcohol-based hand rubs are used, put a small amount of the solution (about the size of a nickel) in the palm of one hand then rub the solution over both hands and between fingers until the solution dries. There is no need to rinse hands afterward. Perform hand hygiene after using the toilet, after touching dirty surfaces or items, before eating, before preparing meals, and anytime your hands are visibly soiled or "feel dirty". Teach this important practice to others including children.

What other information is important for me to know?

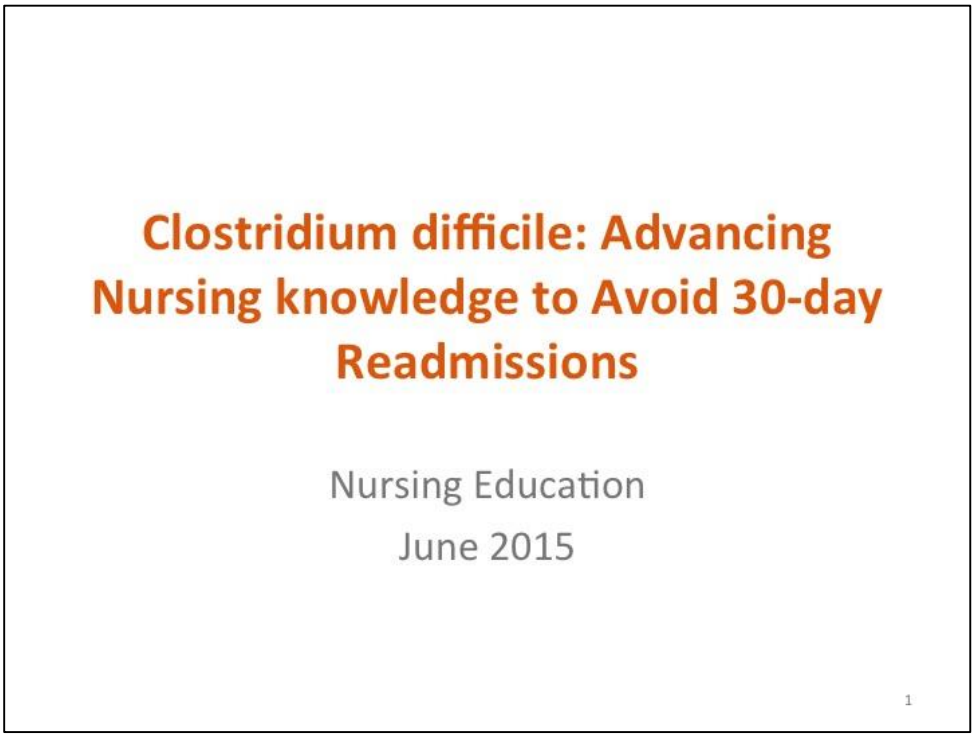
It is very important that you take all your medication as prescribed by your doctor. You should not use any drugs from the drugstore that will stop your diarrhea (e.g. Imodium) as this may result in the *Clostridium difficile* toxins staying inside your colon and causing more severe illness. If your diarrhea persist or comes back, contact your doctor.

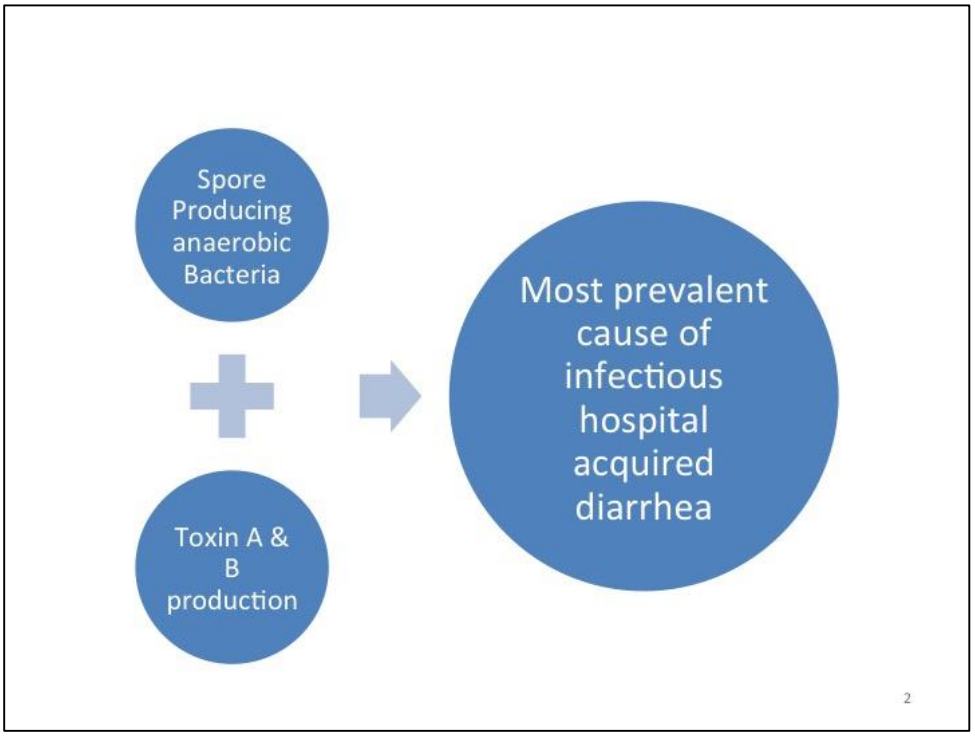
For more information on *Clostridium difficile* infection, go to the Centers for Disease Control and Prevention (CDC) website:

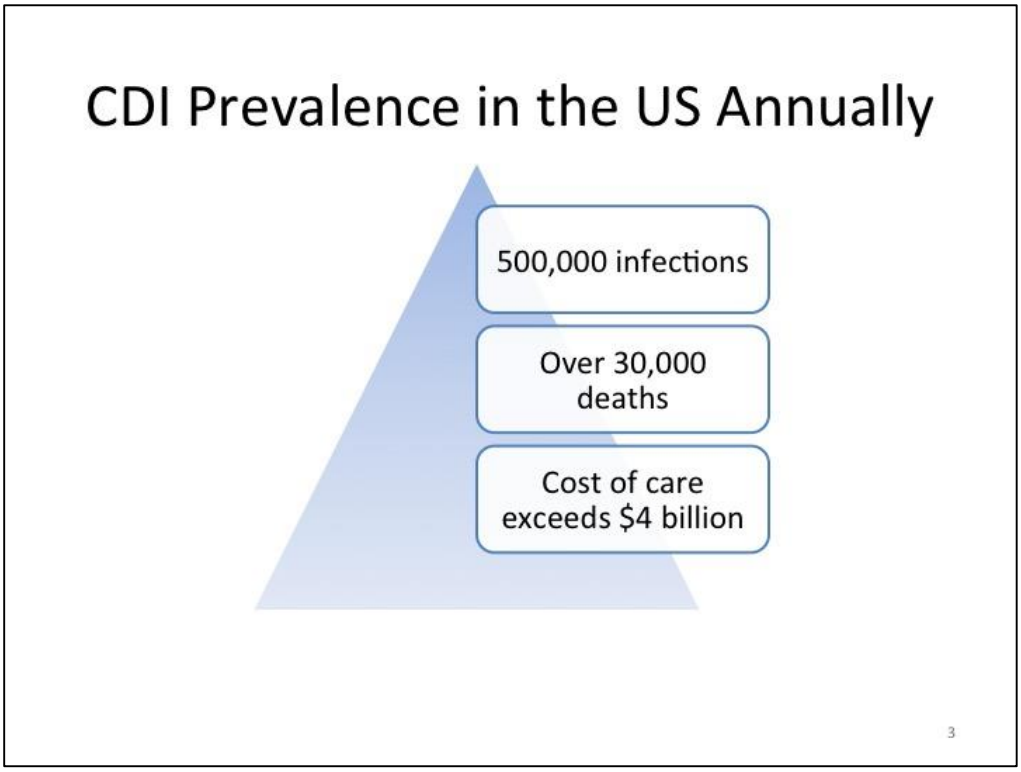
http://www.cdc.gov/ncidod/dhqp/id_CdiffFAQ_general.html

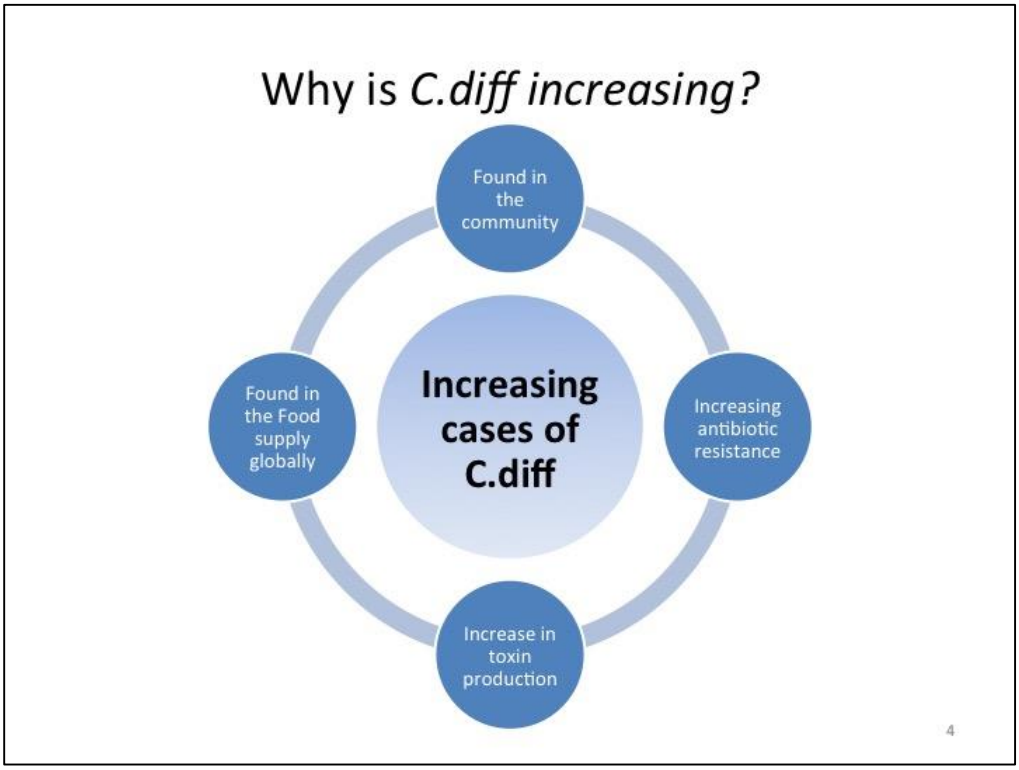


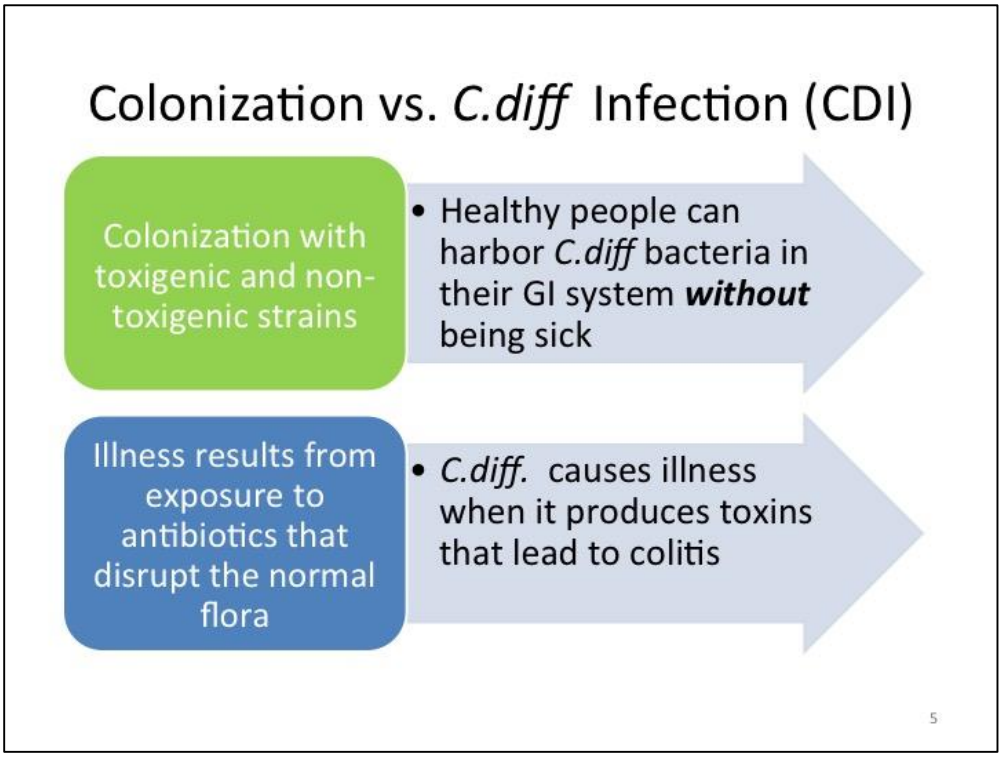
Appendix H – RN Education PowerPoint

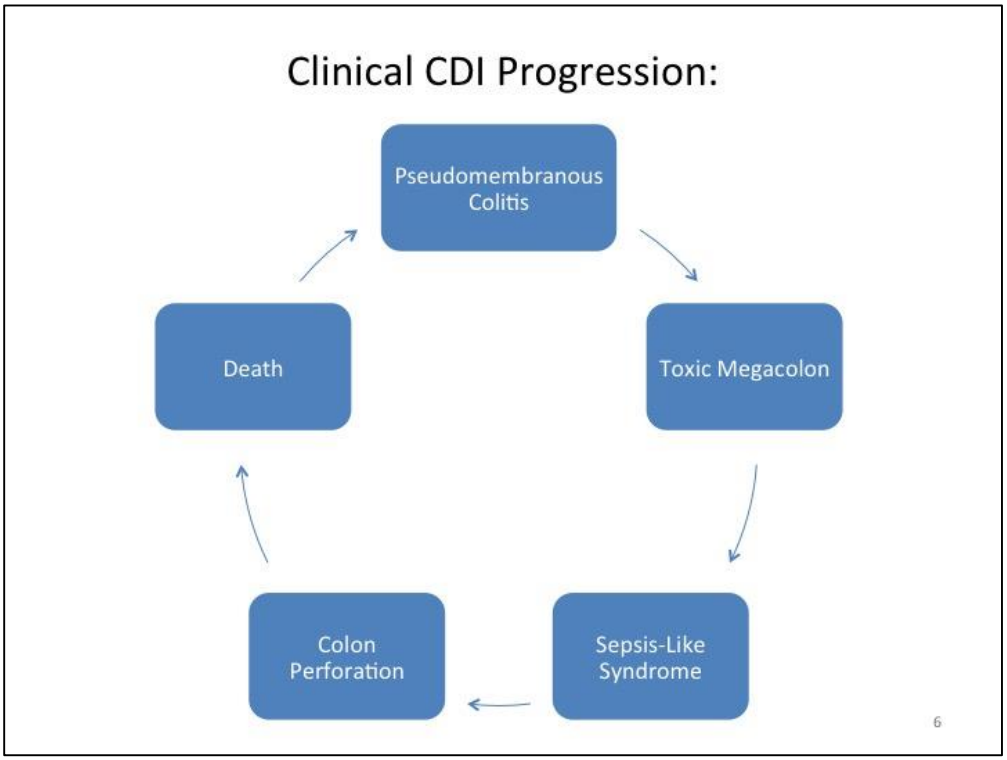


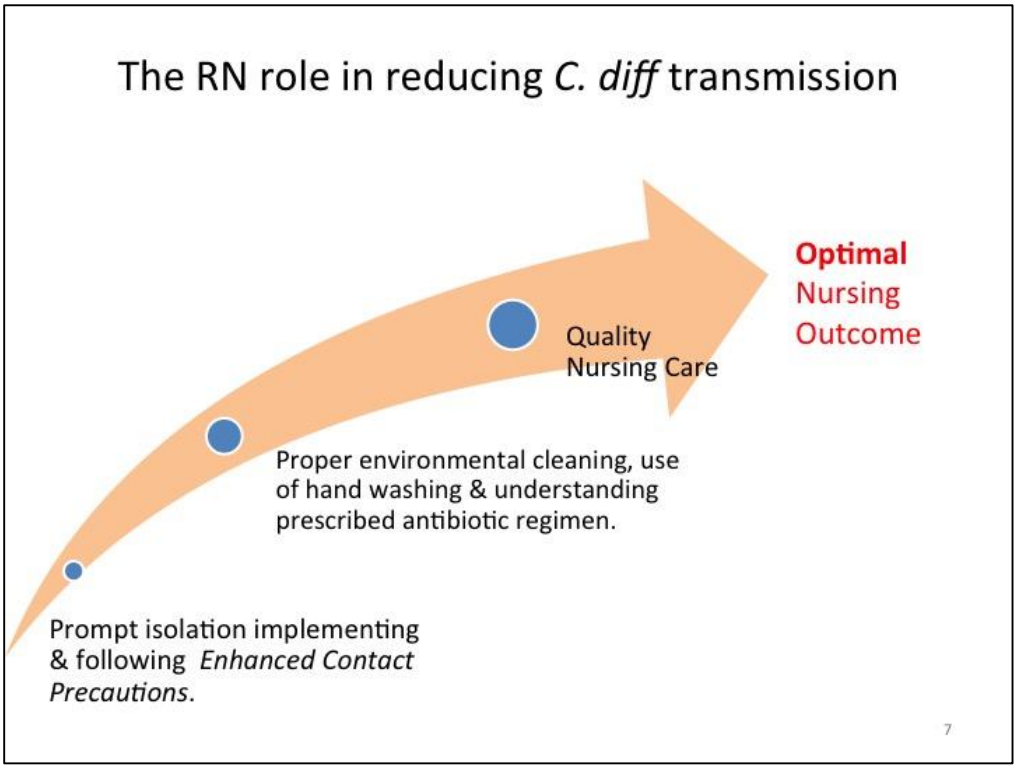


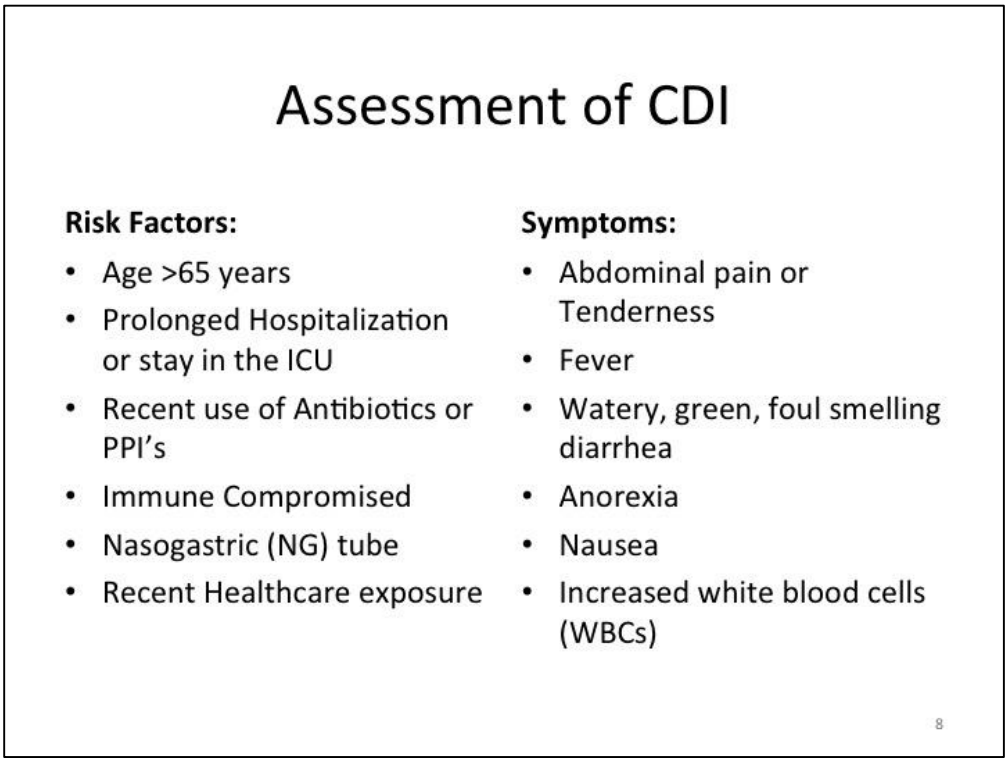

CDI Prevalence in the US Annually
500,000 infections
Over 30,000 deaths
Cost of care exceeds $4 billion
3


Why is C.diff increasing?
Found in the community
Increasing antibiotic resistance
Increase in toxin production
Found in the Food supply globally
Increasing cases of C.diff
4


Colonization vs. C.diff Infection (CDI)
Colonization with toxigenic and non-toxigenic strains
• Healthy people can harbor C.diff bacteria in their GI system without being sick
Illness results from exposure to antibiotics that disrupt the normal flora
• C.diff. causes illness when it produces toxins that lead to colitis
5


Clinical CDI Progression:
Pseudomembranous Colitis
Toxic Megacolon
Sepsis-Like Syndrome
Colon Perforation
Death
6


The RN role in reducing C. diff transmission
Optimal
Nursing
Outcome
Quality
Nursing Care
Proper environmental cleaning, use of hand washing & understanding prescribed antibiotic regimen.
Prompt isolation implementing & following Enhanced Contact Precautions.
7


Assessment of CDI
Risk Factors:
Age >65 years
Prolonged Hospitalization or stay in the ICU
Recent use of Antibiotics or PPI's
Immune Compromised
Nasogastric (NG) tube
Recent Healthcare exposure
Symptoms:
Abdominal pain or Tenderness
Fever
Watery, green, foul smelling diarrhea
Anorexia
Nausea
Increased white blood cells (WBCs)
8

Grading of CDI: An important nursing assessment

Clinical Case Definition	Lab Data and Clinical Findings	Recommended Treatment
Mild or Moderate	WBC ≤ 15 Serum creatinine <1.5x premorbid baseline	Metronidazole (*Flagyl*)
Severe	WBC ≥ 15 Serum creatinine > 1.5x premorbid baseline	Vancomycin
Severe, Complicated	Hypotension Shock Ileus Megacolon	Vancomycin **and consider adding** Metronidazole. For Ileus consider rectal Vancomycin. Consider surgical consultation

9

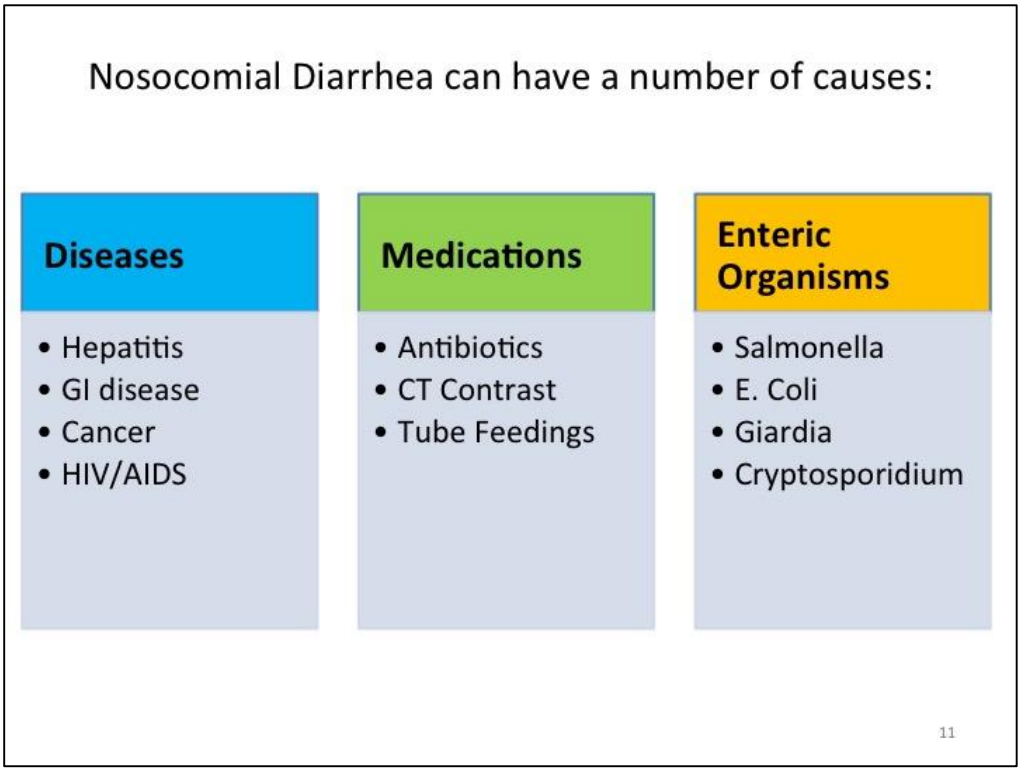
Next steps when suspecting CDI

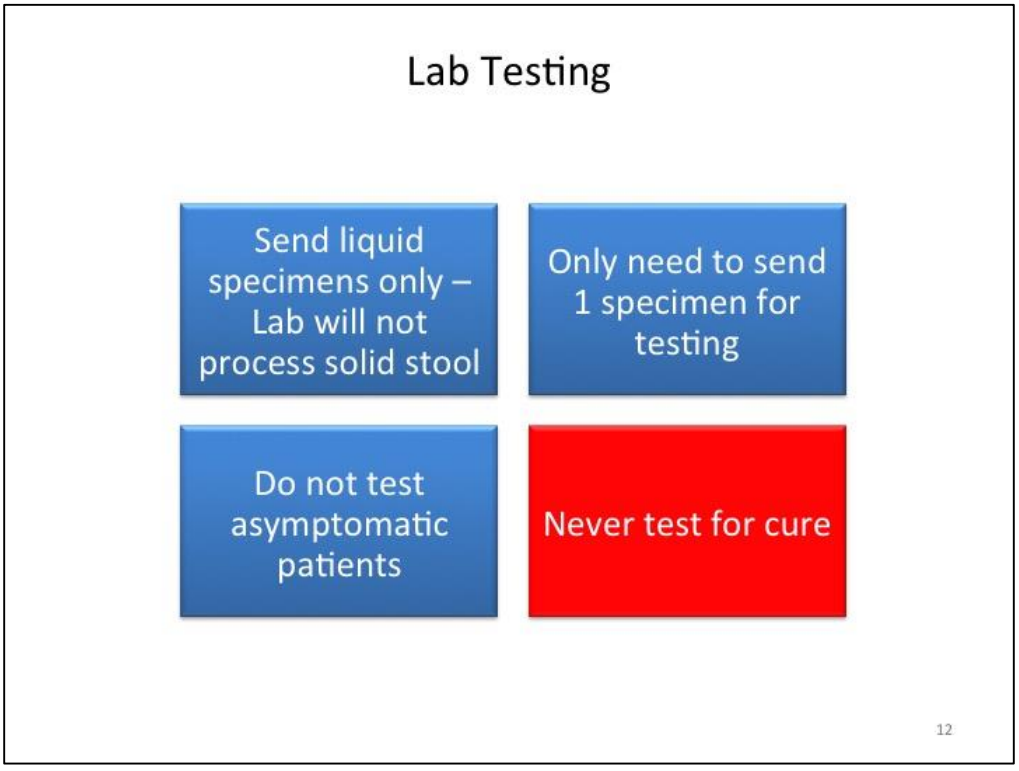
- Notify physician and charge nurse
- Isolate patient immediately with contact precautions per policy
- Send liquid stool specimen for testing
- Use soap and water *after* each patient contact.

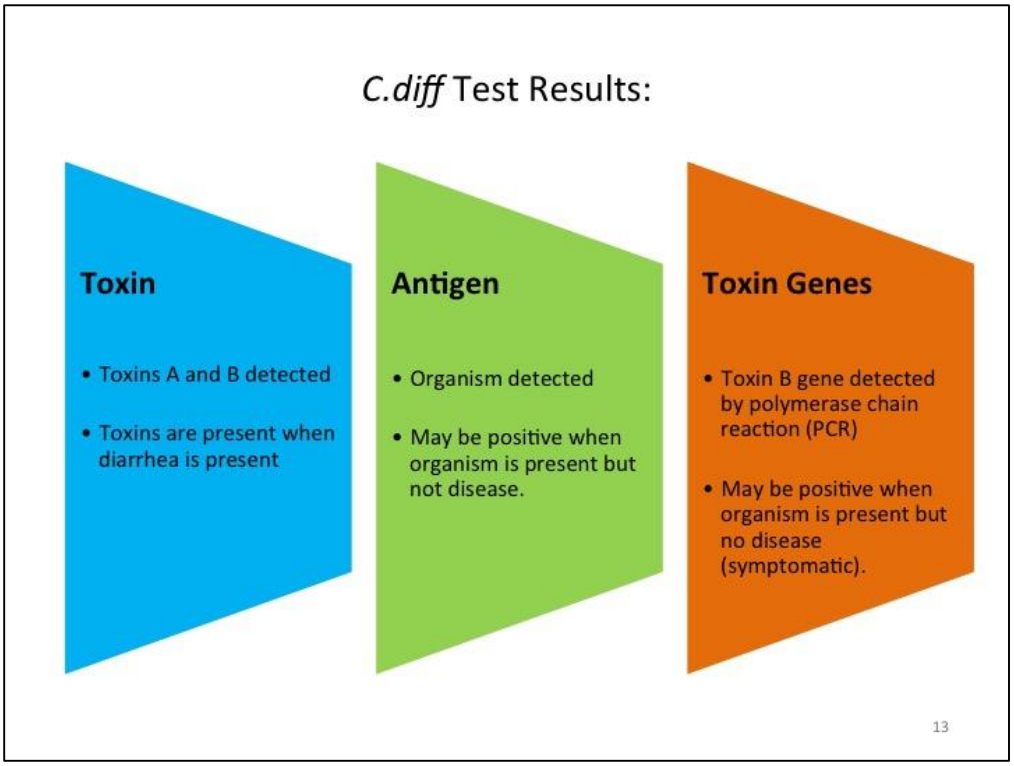
Monitor Patient for potential nursing issues such as:

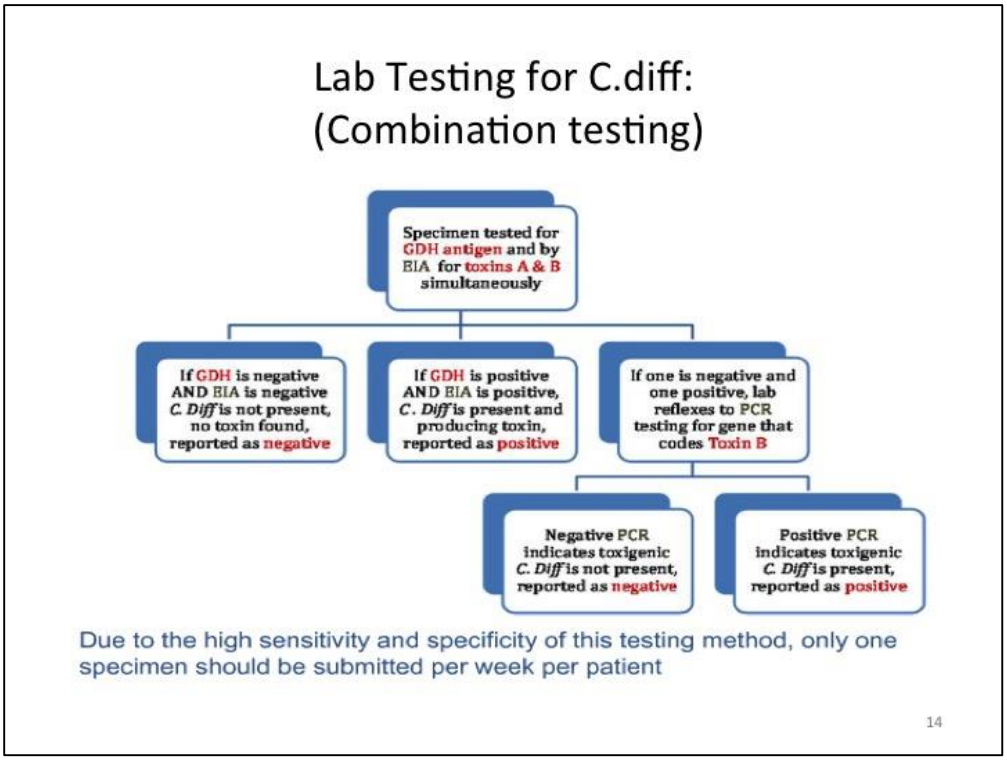
- Fluid Imbalance
- Skin Integrity Issues
- Potential for social/loneliness
- Anxiety
- Altered intake
- Knowledge deficit (CDI)
- Altered learning related to condition

10


Nosocomial Diarrhea can have a number of causes:
Diseases
• Hepatitis
• GI disease
• Cancer
• HIV/AIDS
Medications
• Antibiotics
• CT Contrast
• Tube Feedings
Enteric Organisms
• Salmonella
• E. Coli
• Giardia
• Cryptosporidium
11


Lab Testing
Send liquid specimens only – Lab will not process solid stool
Only need to send 1 specimen for testing
Do not test asymptomatic patients
Never test for cure
12


C.diff Test Results:
Toxin
• Toxins A and B detected
• Toxins are present when diarrhea is present
Antigen
• Organism detected
• May be positive when organism is present but not disease.
Toxin Genes
• Toxin B gene detected by polymerase chain reaction (PCR)
• May be positive when organism is present but no disease (symptomatic).
13


Lab Testing for C.diff:
(Combination testing)
Specimen tested for GDH antigen and by EIA for toxins A & B simultaneously
If GDH is negative AND EIA is negative C. Diff is not present, no toxin found, reported as negative
If GDH is positive AND EIA is positive, C. Diff is present and producing toxin, reported as positive
If one is negative and one positive, lab reflexes to PCR testing for gene that codes Toxin B
Negative PCR indicates toxigenic C. Diff is not present, reported as negative
Positive PCR indicates toxigenic C. Diff is present, reported as positive
Due to the high sensitivity and specificity of this testing method, only one specimen should be submitted per week per patient
14

Treatment of CDI

Drugs to Discontinue

- Consider discontinuation of all unnecessary antibiotics

Drugs to Treat Illness

- Metronidazole (Flagyl) – for mild-moderate disease
- Vancomycin for more severe disease

Successful Treatment Indicators

- Treatment eliminates symptoms, not organism!

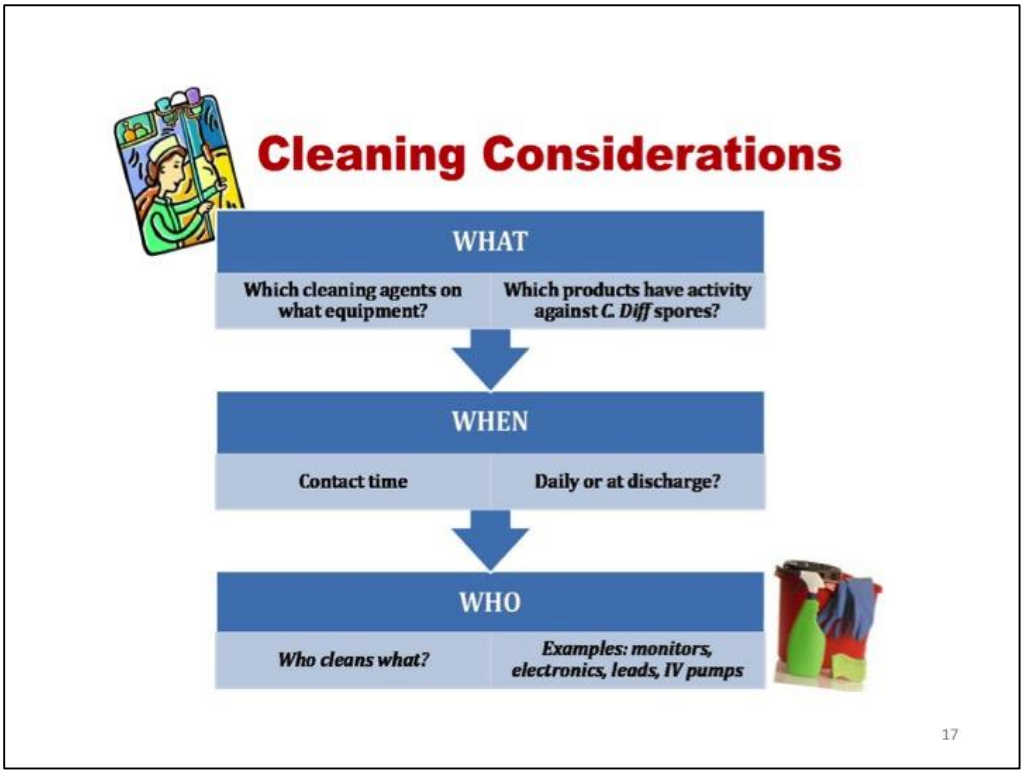
15

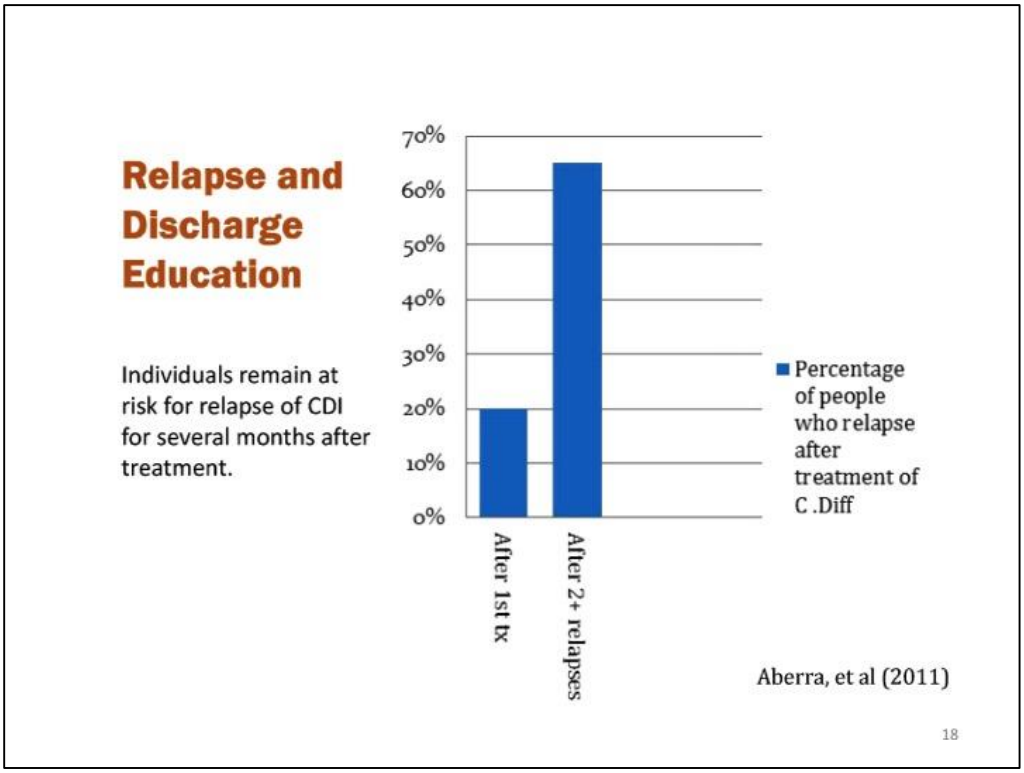
Proper Hand Hygiene *After* contact with patients with CDI or Their Environment

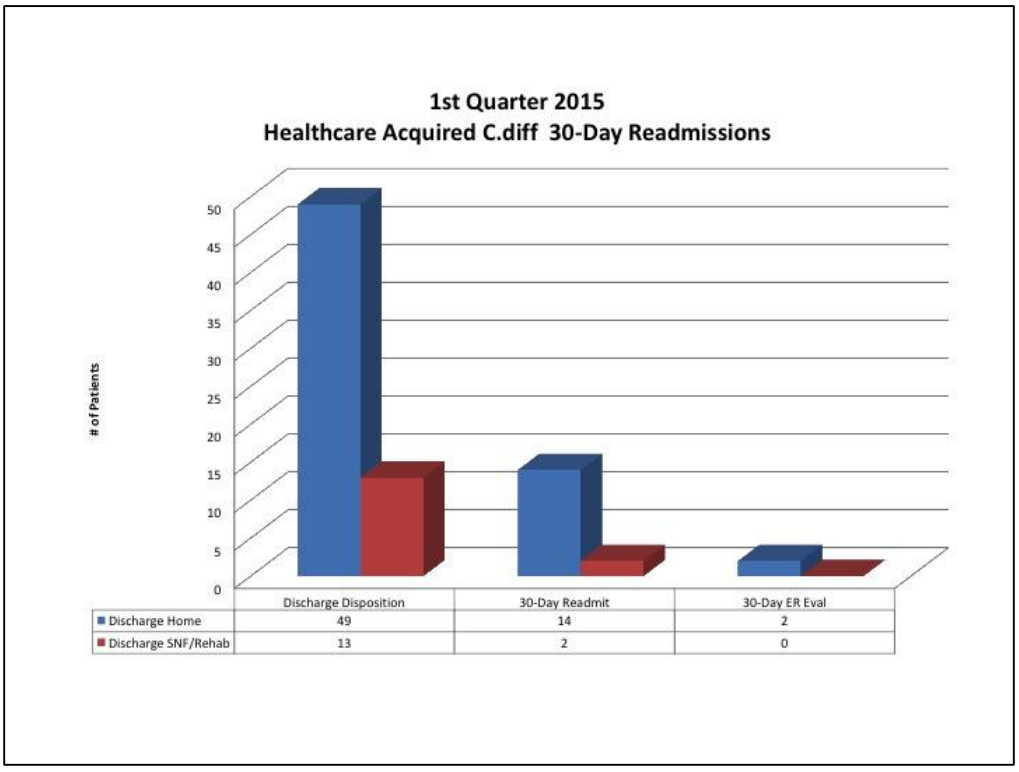
Do not use alcohol-based hand sanitizers!

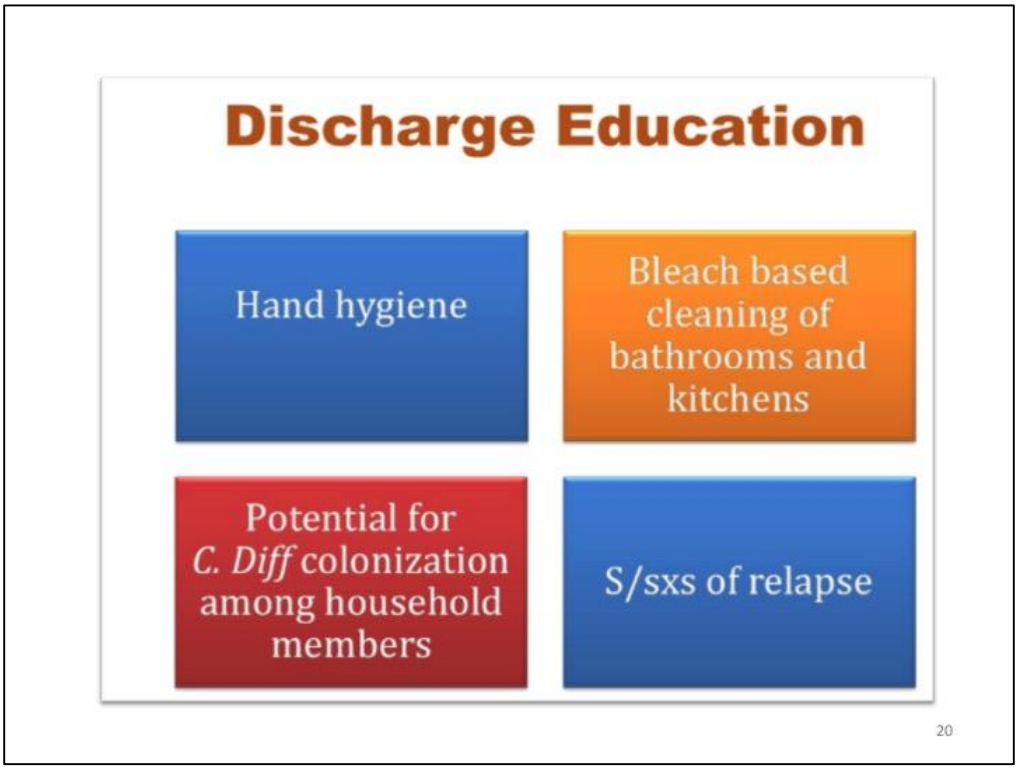
Hand washing with soap and water is best.

16


Cleaning Considerations
WHAT
Which cleaning agents on what equipment?
Which products have activity against C. Diff spores?
WHEN
Contact time
Daily or at discharge?
WHO
Who cleans what?
Examples: monitors, electronics, leads, IV pumps
17


Relapse and Discharge Education
Individuals remain at risk for relapse of CDI for several months after treatment.
70%
60%
50%
40%
30%
20%
10%
0%
After 1st tx
After 2+ relapses
Percentage of people who relapse after treatment of C .Diff
Aberra, et al (2011)
18


1st Quarter 2015
Healthcare Acquired C.diff 30-Day Readmissions
# of Patients
50
45
40
35
30
25
20
15
10
5
0
Discharge Disposition
30-Day Readmit
30-Day ER Eval
Discharge Home
49
14
2
Discharge SNF/Rehab
13
2
0


Discharge Education
Hand hygiene
Bleach based cleaning of bathrooms and kitchens
Potential for C. Diff colonization among household members
S/sxs of relapse
20

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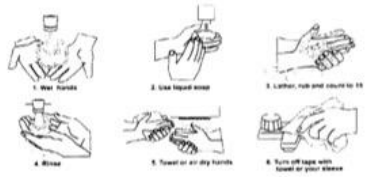
For more information on *Clostridium difficile* infection, go to the Centers for Disease Control and Prevention (CDC) website:

http://www.cdc.gov/ncidod/dhqp/id_CdiffFAQ_general.html



Page 3 of 3

23

THANK YOU!

Special thanks to the New Mexico CDI Prevention Project (CDIPP) & the New Mexico Hospital Association (NMHA) for the content of this educational module.

24

Appendix I – Financials (Budget & ROI)

Budget:

Sutter Healthcare Budget Request

Cost Center#/Name	**Quality - Infection Control**
Request Name	**Bing Tschai, Karen Anderson, Keith Howard**
Request Description	**Program for 30-day clostridium difficile readmission prevention**
Justification	**Project resources for implementation**

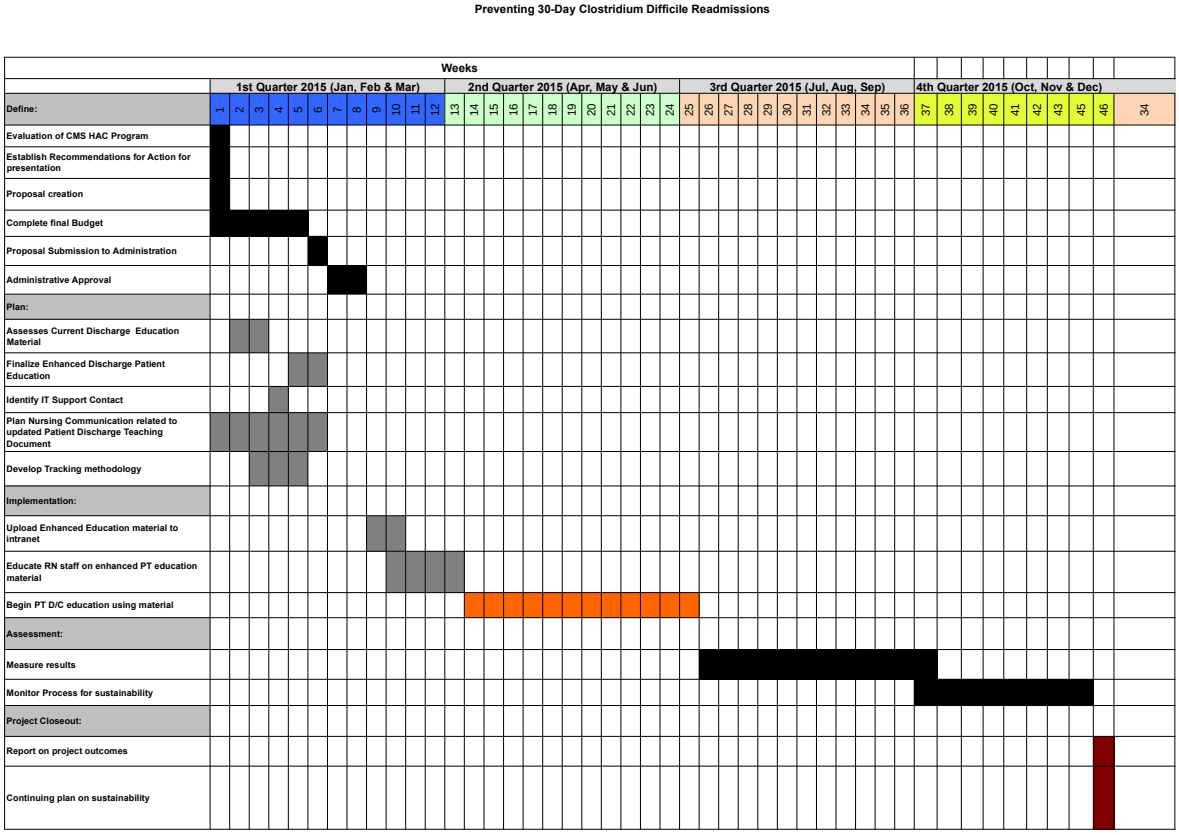
Cost Summary:

Unit Cost		
	Computer	$1,250.00
	Printer	$500.00
	Printer Ink	$250.00
	Paper	$175.00
	3 Ring Binders	$46.00
	Office Supplies	$75.00
Subtotal:		$2,296.00
Sales Tax (8.75%) & Shipping total @ 14.5%		$321.44
Total:		$2,617.44
Additional Costs:		
Capital:		
IT Build outs/Additional Work		
Workspace Design/Construction		
Other		
Trade in:		
Total Capital Request:		**$2,617.44**

Financials / Return on investment

		2015 10% 30 Day Reduction	2016 20% 30 Day Reduction
Medicare inpatient rate as of 2009 data		$20,858	$20,858
Volume:	# of patients	70 total HACDI (10% reduction of 70 HO-CDI total patients is 7)	70 total HACDI (20% reduction of 70 HO-CDI total patients is 14)
Cost per HACDI episode:		$33,055	$33,055
Total Intervention Savings		$231,385	$462,770
Deductions		$0	$0
Net Patient Medicare Revenue (70x$20,858)		$1,460,060.00	$1,460,060.00
HACDI lost Operating Revenue		$2,280,795	$1,851,055
Total Operating Revenue		($589,350.00)	$71,750
Salaries			
FTE-RN		135,000	138,500
Rate:	20%		
Benefits		27,000	27,610
Contract Labor		$0	$0
Professional Fees		$0	$0
Contract Labor Expenses		$0	$0
Total Labor Expenses		162,000	166,110
Depreciation: Useful life	7 Months		
Interest		$0	$0
Bad Debt		$0	$0
Other Expense		$0	$0
Service Contract		$0	$0
Rent		$0	$0
Supplies		$2,700	$2,700
Marketing		$0	$0
Total Expenses		$2,700	$2,700
Excess Revenue over Expense		$0	$0

Appendix J – GANTT Chart



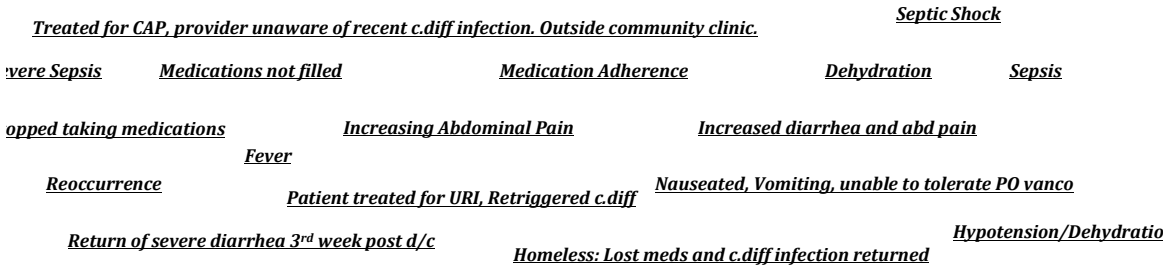
Appendix K – Gap Analysis

Gap Analysis

Best practice to reduce 30-day Readmissions	Current Practice
Consistent use of "Teach Back Patient Education Methodology" to ensure patient learning.	Inconsistent use of teach back education per nursing policy as related to healthcare acquired CDI.
Healthcare provider education and recognition related to changing epidemics of CDI and antimicrobial prescribing practices for CDI across the spectrum of disease.	Inconsistent nursing awareness related to the identification and recognition of patients whom exhibit or present with antibiotic treatment failure for CDI.
Patient adherence to medication regimen as prescribed.	Inconsistent patient education related to antibiotic regimen compliance and patient understanding of implications related to antibiotic therapy in the setting of CDI.
Timely patient follow up with primary care providers following in-patient discharge.	Inconsistent patient follow up with healthcare providers following hospitalization due to failed discharge handoffs.
Patient understanding of CDI and indications of antibiotic treatment failure recognition in the post acute care setting.	Inconsistent patient education specific to recognition of antibiotic treatment failure, signs and symptoms of reemerging CDI and need for immediate primary care notification.
Annual continuing education related to CDI, changing local epidemiology, emerging therapeutics for treatment and related nursing implications of current practice specific to CDI	Inconsistent annual education specific to changing epidemiology, importance of nursing process of care specific to CDI and emerging therapeutics for CDI.
Specialized discharge programs for patients identified as high risk due to lack of post discharge resources.	CDI patients are yet to be considered (institutionally) high risk patients upon discharge to receive specialized services.

Appendix L – Five Categories of 30-Day Readmissions

Retrospective Chart Review of 30-day healthcare acquired Clostridium difficile patients (1st Quarter 2015). (With numerical listing)

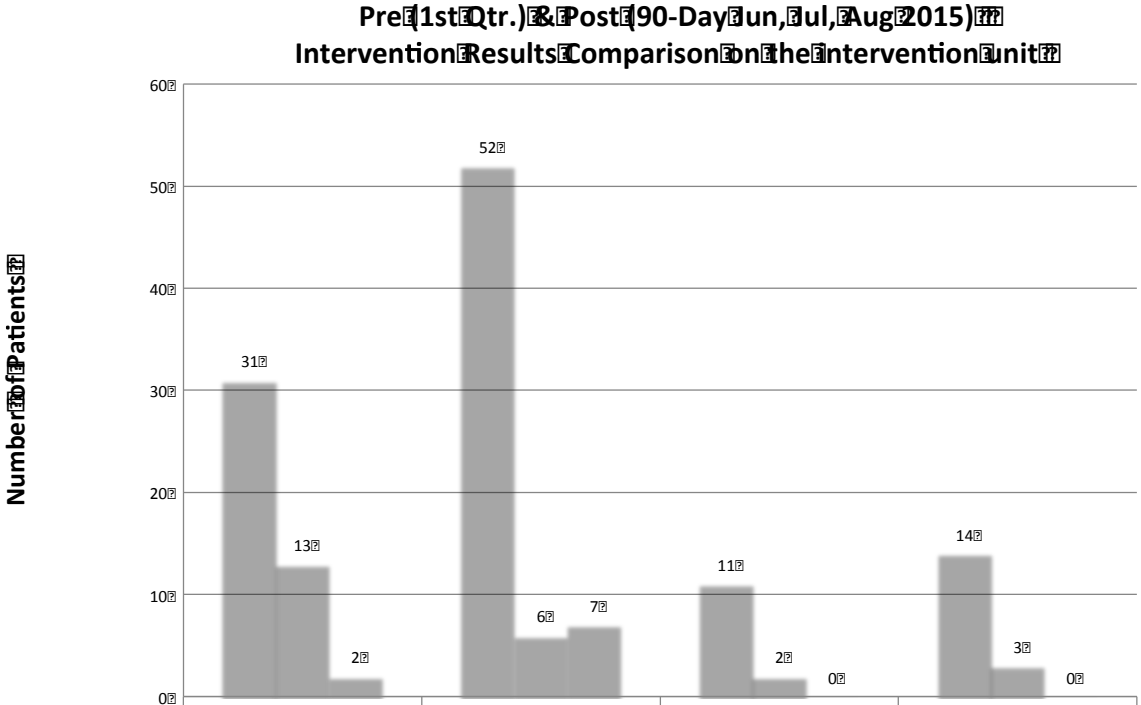


1	Medication Adherence / Side Effects (n=5)
2	Clostridium difficile Complications (n=4)
3	Sepsis (n=3)
4	Provider unaware of recent c.diff infection (n=2)
5	Reoccurrence (n=2)

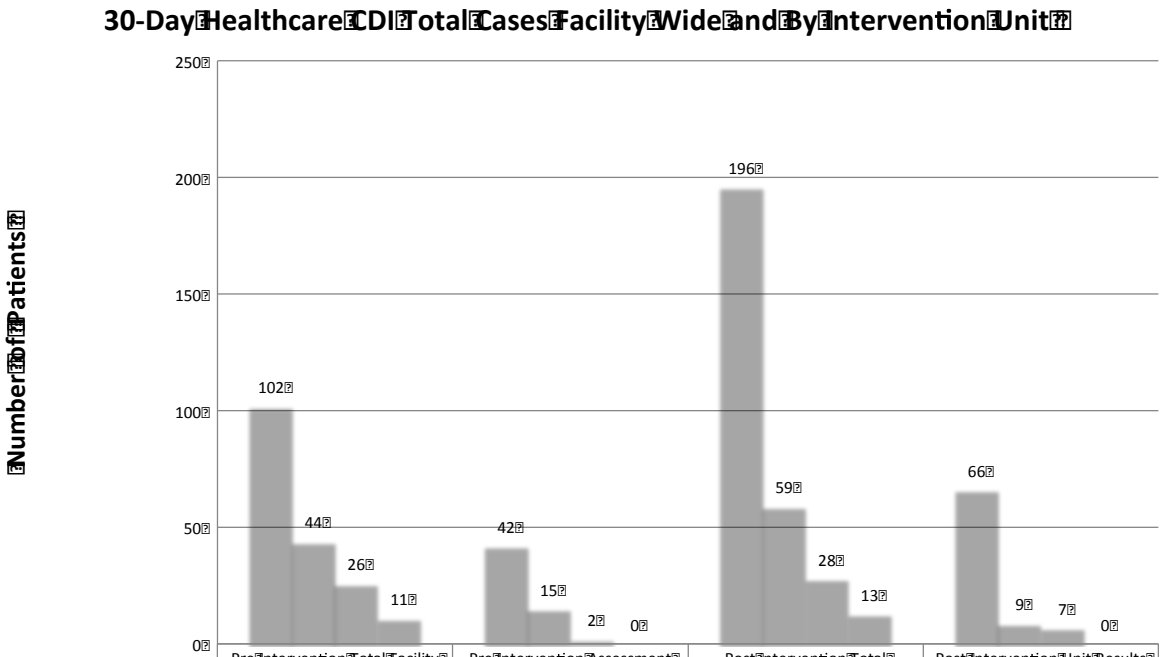
Appendix M – SWOT Analysis

SWOT ANALYSIS – 30-Day C.Difficle Admission

Appendix N – Post Intervention Data



	Pre Intervention Discharge Home	Post Intervention Discharge Home	Pre Intervention Discharge SNF/Rehab	Post Intervention Discahrge SNF/Rehab
Discharge	31	52	11	14
30-Day Readmit	13	6	2	3
30-Day ER Evaluation	2	7	0	0



	Pre Intervention Total Facility Cases	Pre Intervention Assessment Unit (Home & SNF Combined)	Post Intervention Total Facility Cases	Post Intervention Unit Results (Home & SNF Combined)
Total Discharged Patients	102	42	196	66
Total Readmits	44	15	59	9
Total ER 30-Day	26	2	28	7
Total SNF	11	0	13	0

Appendix O – Post Nursing Assessment

Nursing Questionnaire – Post Education Evaluation
C.diff Discharge Education

1. Do you feel that current discharge instructions are sufficient for patients with C.diff?
2. Can you recognize when a patient is on tapered antibiotic treatment for reoccur C.diff infection?
3. What patient discharge education do you provide at discharge for patients with C.diff?
4. Do you use the teach back method of assessment when providing C.diff education?
5. Are there any resources you use to enhance C.diff education during discharge?
6. What specific concepts of self care are discussed (i.e. bathing, HH, etc)?
7. How do you educate to antibiotics on discharge for C.diff?
8. Post discharge which of practices related to sharing bathrooms or how to clean is discussed?
9. What if any information do you tell the patient regarding follow up or when diarrhea begins?
10. How do you teach the patient to recognize C.diff recurrence?
11. What are your suggestions for improving this process?
12. Please provide any feedback:

Appendix P – Patient Education Color Map

Clostridium difficile: Know your Zone Symptom Guide	
Green Zone: All Clear • You are able to drink liquids and eat normally • You are feeling better • No Temperature • Regular stools (formed)	**Green Zone Means:** • Your infection is being treated • The medications are working that helps fight the infection • Increase your activity slowly; it may take several weeks before you feel normal • Make sure to go to your doctor as directed
Yellow Zone: Caution • You are not feeling good • Nauseated and/or vomiting after taking medication • You have a loss of appetite and/or or not taking in liquids • Abdominal cramping and/or pain • Frequent loose stools • Fever/chills	**Yellow Zone Means: WARNING** • You may need to adjust your medications • Call your doctor to discuss your symptoms Doctor:_____ Phone:_____ Call your Home Care Nurse 24 hour number;_____
RED ZONE: MEDICAL ALERT • You have severe abdominal pain • You are unable to eat or drink and/or Vomiting that does not stop • You are short of breath • You have chest pain • Feeling confused or having trouble thinking	**RED ZONE Means: Emergency** • You need to be seen by a doctor NOW! • Call 911 or go to the nearest Emergency room.