# THE MISSING CONCEPT TO IMPROVE THE NURSING PROCESS: A QUALITY MANAGEMENT SYSTEM

---

A Project

Presented

to the Faculty of

California State University Dominguez Hills

---

In Partial Fulfillment

of the Requirement for the Degree

Master of Science

in

Quality Assurance

---

by

Pilar Parker

Spring 2015

Copyright by

PILAR PARKER

2015

All Rights Reserved

This project is dedicated to my mother, Adelina, my husband, Clay, my daughters, Linda, Vanessa, and Nicole, and my grandson, Ricky.

# ACKNOWLEDGMENTS

I would like to take this opportunity to express my profound gratitude to my committee for their continued support and encouragement: Dr. Milt Krivokuca, my committee chair; and professors Bill Trappen and Pam Dunahay. I offer my sincere appreciation for the learning opportunities provided by my committee. My completion of this project also could not have been accomplished without the support of the cardiothoracic surgeons, Dr. Dominic Tedesco and Dr. Lamar Bushnell, who believe that nurses are crucial to improving patient outcomes.

I thank the Community Memorial Hospital in Ventura for permission to include its name in my project. I also thank the nurses for their support throughout this project.

TABLE OF CONTENTS

PAGE

CHAPTER PAGE

LIST OF TABLES

PAGE

LIST OF FIGURES

PAGE



This project is accompanied by a Compact Disk which is housed in the Special Collection Unit of the Library

# ABSTRACT

Quality in the healthcare industry has been gaining much importance in the last two decades. Every health professional is carefully trained to provide high quality service. Historically, healthcare providers have done their best in providing honorable service to the public. However, according to the Agency for Healthcare Research & Quality, the healthcare industry reports hospital stays of $375.9 billion in aggregate costs (2010). As a result, the healthcare crisis has demanded improvement in the quality of the healthcare industry. Because nurses are the largest group of healthcare providers in hospitals, they have become a major target for improving healthcare in the hospital setting. Applying Deming's 14 Points can provide a great resource for addressing this issue with a goal to upgrade the quality of the nursing profession. This project was guided by the need to improve the coronary care unit in order to benefit patient outcomes after cardiac surgery.

# CHAPTER 1

# INTRODUCTION

## Background

Healthcare is challenging because of the complexity of its primary customers: patients. All interested parties in healthcare–patients, families, health providers, third-party payers, health organizations, and government health agencies–present many variations in needs and expectations. Other industries have achieved higher quality products or services by applying superior tools and methodologies for their product (Swensen et al., 2010). This has not been the case in the healthcare industry. After several reports marking a new era of quality in healthcare, more improvement is still needed to this day (Swensen et al., 2010).

Effective nursing care is crucial for improving patient outcomes and subsequently is a key factor in decreasing healthcare expenditures. In the hospital setting, a nurse is the front-line health professional who spends extensive time at the bedside with patients. Many opportunities to improve patient outcomes fall within the scope of nursing and the effectiveness of the particular service provided. Examples include blood glucose monitoring in the postoperative cardiac surgery setting or decreasing the length of stay in the Intensive Care Unit (ICU). Nurses cannot control a customer's characteristics such as personalities, life style, and medical history; however, a consistent nursing service with constant improvement goals can provide efficient and effective nursing care (Swensen et al., 2010). Most hospitals use the Plan-Do-Check-Act (PDCA) method for the continual

improvement of its processes (Russell, 2012). However, reports issued by the Institute of Medicine (IOM) and Centers for Medicare & Medicaid Services (CMS) still identify the need for further improvement in healthcare outcomes. Many healthcare organizations recognize the importance of the nursing profession as a key factor in improving patient outcomes and decreasing healthcare expenditures.

A report from the IOM, *To Err is Human* (1999), set a landmark in healthcare by demanding quality care for the public. Eleven years later, the IOM emphasized another report, focusing on the nursing profession as one of the key forces in the healthcare system for improving medical services and stakeholders' expectations (Institute of Medicine [IOM], 2010). Every healthcare provider was given the responsibility to become more proactive in addressing the existing inconsistencies in medical services (Deming, 1986).

Nurses are on the front line of direct patient assistance in acute and long-term care facilities with great potential to reduce healthcare costs by improving quality patient care and preventing complications that may arise (The Joint Commission, 2010). The Joint Commission fully supports the recommendations developed by the IOM and focuses on three key areas of the nursing profession: (1) clinical nursing practice, (2) nursing education, and (3) research. Change through quality improvement is inevitable (Matthews, 2012). The Joint Commission recommends a standardized model focusing on identifying gaps in nursing, which can jeopardize the quality of patient care and safety (The Joint Commission, 2010). Currently, most hospital-associated adverse events are

correlated with the process of care rather than the patients' admitting diagnosis (Clancy, 2012).

For example, management of hyperglycemia is a nursing process following cardiac surgery, and it has been associated with higher morbidity and mortality rates in both diabetic and non-diabetic patients (Lazar, 2012). Surgeons order protocols for blood glucose management after cardiac surgery, and nurses are the operators following these protocols and, therefore, the first to observe patients' outcomes. Nursing interventions are part of the nursing process that implement patient care and assess patient outcomes, and there is s strong correlation between the nursing process and patient outcomes.

In the case of hyperglycemia management after cardiac surgery, there are long-term studies that suggest diabetic cardiac surgical patients are at higher risk of re-operation for graft closure as well as progressive complications. In the short term, reports show a 24% higher risk of readmission for cardiac-related complications and a 44% higher risk of hospital readmission for any cause (Lazar, 2012). The Department of Cardiothoracic Surgery has reported the need to control blood glucose in order to achieve improved patient outcomes after cardiac surgery (Lazar, 2012). Complications are varied, and include renal compromise or failure, sternal wound infections, pneumonia, stroke, early graft closure, and an increased stay in ICU, which can jeopardize patient outcomes and increase hospitalization costs (Lazar, 2012).

It is important to understand the detrimental effects of hyperglycemia to the body and understand the benefits of hyperglycemia control. The hyperglycemic state impairs glucose metabolism, which is the preferred myocardial state during cardiac-ischemia.

Controlled blood glucose improves myocardial glucose uptake, decreasing the negative effects of hyperglycemia. It is estimated that 30 to 40% of patients having cardiac surgery develop this metabolic syndrome, hyperglycemia (Lazar, 2012). One of the recommendations from the Department of Cardio-thoracic Surgery is to control hyperglycemia for at least the first 48 hours after cardiac surgery. A critical care nurse is the health professional who continuously observes and manages patient care and, therefore, has the opportunity to initiate innovative solutions for hyperglycemia control after cardiac surgery (Lazar, 2012). Having sound communications and collaboration with the medical staff enables critical care nurses to find better solutions to improve patient outcomes by finding the root cause of poor results, which can help improve the nursing process. Hospital-acquired complications can impact patient outcomes, affecting all stakeholders: patients, families, communities, health professionals, third-party payers, and health organizations.

An archive from the Society of Thoracic Surgeons reported that a Virginia statewide data repository with clinical and billing data was used to measure outcomes from 2004 to 2007. The baseline cost of isolated coronary artery bypass grafting cases with no complications during the study period was $26,056. Isolated atrial fibrillation was the most frequently cited complication and had the lowest additive cost at $2,574. Additive costs per patient for isolated coronary artery bypass grafting patients were greatest for those cases involving prolonged ventilation, $40,704; renal failure, $49,128; mediastinitis $62,773, and operative mortality, $49,242 (Society of Thoracic Surgeons, 2009). Mediastinitis is an infection of the mediastinum, which is between the lungs. This

area contains vital organs such as the heart and blood vessels, and infection of the mediastinum is the most costly complication after cardiac surgery.

Risnes, Abdelnoor, Almdahl, and Svennevig (2010) report high blood glucose as the main and most predictable factor causing a severe infection after cardiac surgery. The infection, known as mediastinitis, is related to increased morbidity, mortality, and cost (Risnes et al., 2010).

Another study by Birkmeyer et al. (2012) used 100 % of the national claims files to identify all United States (U.S.) hospitals performing coronary artery bypass grafts (CABGs) between 2005 and 2007. The researchers found a strong, positive correlation between hospital outcomes and healthcare costs. For example, with a CABG, hospitals with the highest complication rate rank had an average cost increase of $5,353 per patient, causing higher healthcare expenditures (Birkmeyer et al., 2012).

## Statement of the Problem

Lagoe, Johnson, and Murphy (2011) described a study comparing two nine-month periods, which showed a relationship between hospital-acquired complications and increased hospital length of stay. In one observation, they noted that patients who developed a urinary tract infection, also considered a Potentially Preventable Complication (PPC), stayed hospitalized a mean of 8.9 to 11.9 hospital days longer, which resulted in an added cost of $2,020 to $ 2,427 per patient. Patients with a hospital-acquired pneumonia (also a PPC) generated increased costs between $2,626 and $3,456 per patient due to extended hospital stays. Similar results were found with median lengths

of stays. The additional expenses for these two complications were calculated at $2,000,000 to $3,000,000 for a three-month period in three general hospitals.

The relationship between patient outcomes and the increased use of resources to treat hospital-acquired complications has become a national forum. Clearly, the primary focus in reducing hospital complications is to improve patient outcomes and quality of life. However, the added benefit of appreciating a measurable reduction of healthcare costs cannot be overstated (Lagoe et al., 2011).

Based on the information listed above, the problem statement for this project was guided by the need to improve the nursing process in the coronary care unit in order to benefit patient outcomes after cardiac surgery. This focus was in compliance with the cardiac surgery core measure to prevent hospital-acquired complications, sponsored by the Department of Cardiothoracic Surgeons (DCS) and Centers of Medicare and Medicaid Services (CMS) to ultimately decrease healthcare expenditures.

The Surgical Care Improvement Project (SCIP) is a quality measure that focuses on preventing surgical complications (The Joint Commission, 2013). The SCIP measure outcome at Community Memorial Hospital in Ventura, which is the focus of this project, is below the state and national average. Non-compliance with the core measure as expected can affect patient outcomes and hospital reimbursement.

## Purpose of the Study

This study focused on investigating and implementing a superior management quality philosophy for the nursing profession in order to improve customer service and patient outcomes and decrease hospitalization time and healthcare expenditures in the

Ventura hospital. Results were compared to California's state and national average for the specific outcome. A quality philosophy was expected to guide the profession through a formal process approach for continual improvement of the nursing profession.

The purpose of this project was to demonstrate that utilizing efficient quality tools for improving the nursing profession could decrease healthcare costs by comparing patient outcomes before and after the implementation of a quality management philosophy for the nursing process. Proper execution of an effective management service applied to a nursing process could also increase hospital reimbursement for the service provided. Hospital reimbursement had been affected by noncompliance of the core measures guidelines, which determine reimbursement based on patient's outcomes in compliance with best practices of care.

## Theoretical Basis for the Study

Deming's 14 Points philosophy supports employee involvement and empowerment with continuous improvement as concepts that play a crucial role for the success of any business. Every employee supports the continuous success of an efficient organization, and employees are encouraged to use their expertise and knowledge to suggest improvements.

The primary purpose of this study was to evaluate if applying Deming's 14 Points philosophy to the nursing profession and processes could improve patient outcomes and decrease healthcare expenditures. In addition, the study was to show if employee involvement and empowerment enhanced morale, productivity, and creative participation in satisfying customers. As a result, the quality of service could be greatly improved

(Deming, 1986). Figure 1 shows the proposed model applied to customer expectations to achieve expected outcomes.

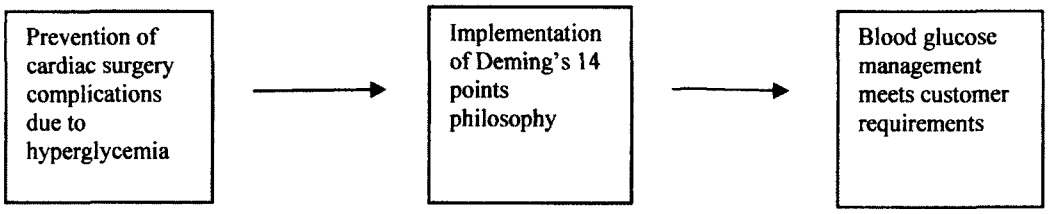



*Figure 1*. Proposed theoretical model applied to customer expectations. The goal of this process is to achieve expected outcomes.

## Limitations of the Study

This investigation focused on the implementation of Deming's 14 Points philosophy in the nursing profession and process to improve patient outcomes after cardiac surgery. Results of post-cardiac surgery blood glucose management data from a local hospital to California and national average were followed. The study was conducted at the Community Memorial Hospital (CMH) in Ventura, California. The sample included the insertion of Deming's 14 Points to the nursing process (blood glucose management) of the post-operative care for cardiac surgical patients. The use of Deming's philosophy was a new concept for health professionals, and it was challenging for this group to understand.

## Definition of Terms

Glycemic: The presence of glucose in the blood.

Hospital-acquired Complication: An illness acquired during hospitalization.

Hyperglycemia: High blood glucose levels.

Mediastinal: The middle of the chest area that separates the lungs.

Mediastinitis: An infection of the mediastinal incision.

Nursing Process: This process is composed of five elements: assessment, diagnosis, planning, implementation, and evaluation.

Process Approach: A desired result is achieved more efficiently when activities and related resources are managed as a process.

# CHAPTER 2

## REVIEW OF RELATED LITERATURE

Several sources were considered when reviewing the importance of improving the nursing profession for the benefit of today's healthcare system. The nursing process was seen as a key factor for improving the quality of healthcare and patient outcomes while decreasing health costs. The review of related literature supported the basis of the project that the implementation of Deming's 14 Points as part of the nursing profession could enhance the nursing process, resulting in improved patient outcomes and decreased healthcare expenditures.

Medicare Hospital Compare (2014) has been created through the efforts of the CMS and other organizations representing consumers, payers, federal agencies, hospitals, and accrediting organizations (http://www.medicare.gov/hospitalcompare/search.html). Hospital Compare is part of the Hospital Quality Initiative Program. The purpose of the initiative is to promote and support improvements in the quality of care provided by hospitals. Over 4,000 Medicare-certified hospitals compare their patient care outcomes, and timely and effective care section reports how hospitals comply with best practices to prevent surgical complications. All patients are included in the comparisons regardless of having diabetes or not benefiting from good blood glucose control by lowering the risk for surgical complications.

The project for this paper focused on blood glucose control after heart surgery, and glucose control after heart surgery also was part of the core measure SCIP. Results

are public records on the Hospital Compare website, and non-compliance affects hospitals' statistics and reimbursement for surgical services.

An analysis of Table 1 shows the need to improve post-operative blood glucose. Data from CMH and another local hospital, Saint John's Regional Medical Center (SJRMC), which are public records, have been collected from June 2011 to July 2012. Results from the two hospitals are below the state and national average (Medicare, 2013). These results demonstrate the SCIP core measure to be a challenge for hospitals. This measure is connected to pay-for-performance and patient outcomes and efforts to improve compliance is a priority for health providers.

Table 1

*The Official U.S. Government Site for Medicare –Timely and Effective Care*

| | CMH | SJMC | California Average | National Average |
|---|---|---|---|---|
| Core Measure SCIP Results | 92% of 138 patients | 86% of 101 patients | 95% | 96% |

*Note*. Heart surgery patients whose blood glucose is kept under good control in the days right after surgery. Higher percentages are better. Data retrieved from Medicare Website, 2013, at http://www.medicare.gov/HospitalCompare/details.aspx?msrCd=Prnt2

J. Birkmeyer (2012) is a recognized leader in surgical outcomes research and health policy. A former editor of the *Dartmouth Atlas of Health Care*, his research has focused on understanding the variation in hospital outcomes and expenditures with surgery, and he has authored several papers on performance measurement for the CMS and the IOM. Birkmeyer also has chaired an expert panel on evidence-based hospital

referrals for the Leapfrog Group, a national coalition of public and private stakeholders, and jointly authored "Hospital Quality and the Cost of Inpatient Surgery in the United States," published in the *Annals of Surgery,* a highly referenced international surgery journal (Birkmeyer, J., Gust, Dimick, Birkmeyer, & Skinner, 2010). This journal provides the latest research results on significant contributions to the improvement of surgical practice. As a result, surgeons follow the journal for innovations in practice and surgical techniques.

Birkmeyer et al. in their research (2012) examined the correlation between CABG complications and high healthcare expenditures and concluded that improving the quality of surgical services after CABG may consequently improve outcomes and reduce costs. This research also concluded that the actual rate of complications after CABG is higher than expected, according to Medicare data as displayed in Table 2.

Table 2

*Predicted and Actual Outcomes Rates for Hospitals*

| | Hospital Quintiles | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| CABG (1,060 hospitals, 221,894 patients) | | | | | |
| | Risk adjusted mortality | | | | |
| Predicted mortality | 3.90% | 3.75% | 3.77% | 3.60% | 3.67% |
| Actual mortality | 1.90% | 2.93% | 3.70% | $.47% | 6.54% |
| | Risk adjusted complication rates | | | | |
| Predicted rate | 22.1% | 22.3% | 22.5% | 22.9% | 23.6% |
| Actual rate | 15.3% | 19.5% | 22.1% | 25.6% | 32.7% |

*Note.* Hospitals performing CABG surgeries. Outcomes quintiles of hospitals ranked on risk- and reliability-adjusted mortality and complication rates. Based on 2005–7 national Medicare data.

R. Lagoe, member of the Hospital Executive Council in New York, designed the study and development of the data for a group report of three hospitals. M. Murphy, a St. Joseph's Hospital Health Center member in New York, was in charge of developing the data for St. Joseph's Hospital Health Center. P. Johnson, a Community General Hospital member in New York, was responsible for developing data for Community-General Hospital. In "Inpatient Hospital Complications and Length of Stay: A Short Report," published by *National Institutes of Health* (2011), authors Lagoe, Murphy, and Johnson reported the relationship between hospital's acquired complications (urinary tract infection and pneumonia) and the significant increase in healthcare costs.

This report was based on the collection of data from three different hospitals in New York to compare the additional healthcare costs due to hospital-acquired infections. The Potentially Preventable Complications (PPC) system discussed the excess of hospital days for patients with a preventable complication. Patients who experienced complications had a longer hospital stay. The study was based on urinary tract infection and pneumonia data between the 2008 and 2009 as displayed in Table 3 and Table 4. The results showed that the excess stay for PPC-urinary tract infection patients increased from 2,020.3 to 2,427.6 additional days between the two years. The excess stay for PPC-pneumonia patients increased from 2,626 to 3,455.6 additional days. The extra cost for both PPCs was valued between $2,000,000 and $3,000,000 for a three-month period. This study reinforced the need to control blood glucose after cardiac surgery to prevent surgical infections.

Table 3

*Table Length of Stay with Urinary Tract Infection*

| | Patients with PPC | | | Patients without PPC | | | Excess days for PPC patients |
|---|---|---|---|---|---|---|---|
| Jan-Sep 2008 | Number of Discharge | Patients Days | Mean | Number of Discharge | Patients Days | Mean | |
| Community General Hospital | 52 | 564 | 10.8 | 1,359 | 5,938 | 4.4 | 332.8 |
| Crouse Hospital | 67 | 1,158 | 17.3 | 1,414 | 7,659 | 4.4 | 864.3 |
| St. Joseph Hospital | 108 | 1,548 | 14.3 | 3,104 | 18,514 | 6.0 | 896.4 |
| Health Center Total | 227 | 3,270 | 14.4 | 5,877 | 32,111 | 5.0 | 2,020.3 |
| Jan-Sep 2009 | Number of Discharge | Patients Days | Mean | Number of Discharge | Patients Days | Mean | |
| Community General Hospital | 29 | 485 | 16.7 | 664 | 3,260 | 4.9 | 342.2 |
| Crouse Hospital | 80 | 1,224 | 15.3 | 1,486 | 7,733 | 5.2 | 808.0 |
| St. Joseph Hospital | 95 | 1,837 | 19.3 | 3,032 | 17,672 | 5.8 | 1,282.5 |
| Health Center Total | 204 | 3,546 | 17.4 | 5,182 | 28,665 | 5.5 | 2,427.6 |

Table 4

*Length of Stay with Pneumonia and Other Lung Infections*

| | Patients with PPC | | | Patients without PPC | | | Excess days for PPC patients |
|---|---|---|---|---|---|---|---|
| Jan-Sep 2008 | Number of Discharge | Patients Days | Mean | Number of Discharge | Patients Days | Mean | |
| Community General Hospital | 33 | 372 | 11.3 | 728 | 3,598 | 4.9 | 211.2 |
| Crouse Hospital | 31 | 481 | 15.5 | 617 | 3,568 | 5.8 | 300.7 |
| St. Joseph Hospital | 148 | 3,827 | 25.9 | 3,073 | 18,279 | 5.9 | 2,960 |
| Health Center Total | 212 | 4,680 | 22.1 | 4,418 | 25,445 | 5.8 | 3,455.6 |
| Jan-Sep 2009 | Number of Discharge | Patients Days | Mean | Number of Discharge | Patients Days | Mean | |
| Community General Hospital | 34 | 515 | 15.1 | 679 | 3,347 | 4.9 | 346.8 |
| Crouse Hospital | 53 | 982 | 18.5 | 1,076 | 5,679 | 5.3 | 699.6 |
| St. Joseph Hospital | 115 | 2,256 | 19.6 | 2,750 | 16,015 | 5.8 | 1,587.0 |
| Health Center Total | 202 | 3,753 | 18.6 | 4,505 | 25,041 | 5.6 | 2,626.0 |

*Glycemic Control during Coronary Artery Bypass Graft Surgery*, by H. Lazar (2012), reinforces conclusions from other research reports that hyperglycemia is associated with increased complications after cardiac surgery (http://www.hindawi.com/isrn/cardiology/2012/292490/). This report also presents recommendations from the Society of Thoracic Surgery, regarding blood glucose management after cardiac surgery, and explains the physiological impact of blood glucose management and its improved outcomes. Lazar is a member of the Department of Cardiothoracic Surgery and professor at the Boston University School of Medicine and Director of Cardiothoracic Surgery research at Boston Medical Center.

The information provided by Lazar reinforces the problem statement for this project, which focuses on how an improved nursing process in managing blood glucose control (project sample) can prevent surgical complications, decrease hospital lengths of stay, increase customer satisfaction, and decrease healthcare expenditures.

The article, "Mediastinitis After Coronary Artery Bypass Grafting Risk Factors and Long-Term Survival," by Risnes, Abdelnoor, Almdahl, and Svennevig, in *The Annals of Thoracic Surgery* (2010), supports the information stating that not controlling high blood glucose results in complications after cardiac surgery. These complications, such as infection, may result in higher mortality and healthcare costs. Therefore, the project in this paper focuses on strategies aimed to improving the nursing processes, which must be implemented in order to improve blood glucose management after cardiac surgery.

Co-authoring this report, Risnes is a member of the Society of Thoracic Surgeons, specializing in cardiac surgery with a targeted interest in mediastinitis; Abdelnoor studies intensively in Epidemiology and Biostatistics at the Center of Clinical Research in Norway; and Almdahl and Svennevig are cardiovascular surgeons and members of the Society of Thoracic Surgeons (STS).

The STS, led primarily by R. Adams-Cowley (2009), represents over 6,600 surgeons, researchers, and allied healthcare professionals worldwide (http://www.sts.org/). Founded in 1964, the mission of the STS is to provide the highest quality patient care through education, research, and advocacy. The report provided by STS is an important quality improvement tool for cardiac surgery programs throughout the nation, for it enables these programs to assess and compare their performance with similar participants in their region.

The STS report includes data regarding hospital costs from cardiac surgery complications and increased hospital length of stay following cardiac surgery. This information supports the importance of controlling blood glucose after cardiac surgery in order to decrease the risk of complications. Assessing and managing blood glucose is a nursing process; therefore, improving the blood glucose control process requires the full involvement of nurses. Improving the blood glucose management process can prevent surgical complications resulting in optimal patient outcomes, fewer hospitalization days, and decreased hospitalization costs.

Dolansky and Moore (2013) discussed the "Quality and Safety Education for Nurses (QSEN): The Key is System Thinking," posted on the *Online Journal of Issues in*

*Nursing.* The QSEN is an initiative for redesigning the healthcare professional's education to better meet customer's expectations. This initiative was developed by nursing leaders with the intent to guide nursing educators into developing quality and safety skills for the nursing profession to better prepare nurses with the current and oncoming challenges in healthcare. Other initiatives such as Core Measures, National Patient Safety Goals, 5 Million Lives Campaign, Hospital Acquired Conditions, and Transforming care at the bedside have been implemented to increase quality healthcare in efforts to keep patients safe while attaining faster recovery and decreasing complications from hospitalization. Despite these efforts, the Leapfrog Group, a national healthcare quality organization, reported that the majority of hospitals have achieved minimum improvement in providing high quality safety to their customers (Dolansky & Moore, 2013).

According to Dolansky and Moore (2013), the missing part in QSEN is the nurse's vision to provide a service at the level of individual and system care instead of just the level of the individual. Traditionally, the nursing profession has viewed the patient as the only focus of care, without taking into consideration every other aspect around patient care and how every health provider in contact with the patient, either directly or indirectly, impacts patient outcomes. In the hospital setting, a nurse is the only health professional to stay updated about a patient's condition at all times. It makes sense, therefore, to train nurses to continuously evaluate potential improvements and safe care for the patients that result in high quality service. The authors discuss the need to implement a system's thinking philosophy in the nursing profession in order to give

nurses the skills needed to continuously improve the health service they provide to their customers (Dolansky & Moore, 2013).

System thinking provides nurses with the skills to understand the environment around their customers. It also helps to present how every department in the organization is interrelated to provide the best care for their customers. Applying the appropriate training to go along with the personal responsibility of each individual in order to understand and follow each concept can help achieve the expected results. Nurses have to update how they view themselves as the primary health providers to patients and how their nursing processes can impact patient outcomes. An important point in connecting the nursing processes to national quality and safety initiatives is to provide nurses with quality tools. These tools can help nurses understand the complex characteristics of healthcare and the need for continuous improvement. In order to achieve the desired outcomes, a philosophy such as Deming's 14 Points must be applied when expanding the nurse's scope of thinking towards national quality expectations and the impact from their nursing processes on quality outcomes (Deming, 1986).

In *Using Dedicated Nurses to Improve Core Measures,* A. Green and L. Buckler (2013) discussed the results from a study conducted by the University of Kentucky Health Care. This study created a team to identify the barriers and solutions to increase compliance with the core measures guidelines, established by the Centers of Medicare and Medicaid Services (CMS). The activate participation of a team of nurses led to positive results in improving core measures performance. This discussion by the Green

and Buckler study reinforced the purpose of this project, which is improving a nursing process to achieve higher compliance with the SCIP core measure.

R. Hughes (2008), Associate Professor of the Marquette University, has focused her career on healthcare quality and evidence-based practice. Serving nine years as Senior Health Scientist Administrator at the Agency for Healthcare Research and Quality (AHRQ), Hughes has influenced the quality of healthcare at a national level. Currently, her research program focuses on healthcare organizations and how each organization's environment affects patient outcomes. The author recognizes nurses as a key factor in preventing medical errors and improving patient outcomes by providing safety, continuous improvement, and high quality care.

"Role of Professional Organizations in Advocating for the Nursing Profession," by J. Matthews (2012), discusses the characteristics and evolution of the nursing profession in alignment with society's needs. Societal changes demand involvement and improvement of the nursing profession, and this article supports the empowerment of nurses in improving their practice. Therefore, nurses who determine their scope of practice and improve their workforce practice while influencing the cost and quality of care have the ability to meet society's needs. This idea supports the need of the nursing profession to refine its nursing process in order to become more consistent, efficient, and continually improving.

Matthews is Professor of Nursing at Shenandoah University in Winchester and a member of the American Academy of Nursing and the American Nurses Association Committee on Bylaws. Also serving as a Senior Magnet Appraiser for the Magnet

Nursing Services Recognition Program (American Nurses Credentialing Center), her work with the Magnet Program and the Virginia Nurses Association has allowed her to advocate for policies related to nursing practice and quality nursing care. Matthews advocates that change in the nursing profession with relation to quality improvement is inevitable, and this advocacy aligns with the purpose of this project. The nursing profession needs a cultural change to improve the efficacy of its service.

"The Role of Nurses in Improving Hospital Quality and Efficiency," by J. Needleman and S. Hassmiller (2009), is a scholarly paper that discusses the crucial role nurses play in improving the quality and efficacy of the healthcare system. According to these authors, implementing front-line process improvement models can be effective in improving quality of care and decreasing hospital costs. Hassmiller is a senior adviser for nursing at the Robert Wood Foundation in Princeton, and Needleman is a professor in the Department of Health Services and School of Public Health at the University of California.

In this paper, the authors reinforce the idea that the nursing profession has a great impact in the quality of health care. They suggest that the profession needs to adopt a process improvement model that is consistent and fosters a continual improvement practice. This idea can be used in Chapter 3 of this project, where it is discussed that the implementation of Deming's 14 Points can improve the nursing process.

The American Nurses Association (ANA) (2013) is the only professional organization representing the interests of the nation's 3.1 million registered nurses. The ANA advances the nursing profession by supporting high standards of nursing practice,

promoting the rights of nurses in the workplace, and lobbying on healthcare issues that affect nurses and the public. The mission of the ANA is focused on advancing the profession with visions to improve health for the nation. This association has been advocating for professional empowerment by nurses increasing their level of professional practice.

The ANA website (http://www.nursingworld.org) determines and describes the nursing process as the core practice for all nurses. The areas of the nursing process are listed as assessment, diagnosis, planning, implementation, and evaluation. These areas can benefit from an organized, consistent process that is aimed at constant improvement. The professional guidelines provided by the ANA serve as the foundation for this project, and implementing Deming's 14 Points as part of the nursing profession has resulted in efficient improvements for the issue at hand.

The IOM is an independent, non-profit organization unrelated to the government that provides unbiased advice to decision makers and the public. Established in 1970, the IOM is the health resource of the National Academy of Sciences, chartered under President Abraham Lincoln in 1863. The IOM researches the nation's questions about healthcare and helps those in the government and private sector make informed health decisions by providing evidence they can trust. Studies done by the IOM are requested by federal agencies and independent organizations. Important reports completed by the IOM have defined a landmark in healthcare to focus on quality care for the public and have identified the nursing profession as a key factor for decreasing healthcare expenditures.

Reports from the IOM (2010) website (http://www.iom.edu/) provide the foundational ideas for this thesis, aimed at benefiting the nursing profession and subsequently, improving the quality of healthcare while decreasing the costs. In its report, "The Future of Nursing: Leading Change, Advancing Health", the IOM discusses the crucial need for the nursing profession improvement.

The Joint Commission (TJC) is an independent, non-profit organization that accredits and certifies more than 20,000 healthcare organizations in the U.S. Its accreditation and certification is recognized as standard of quality in healthcare. The TJC and its website (http://www.jointcommission.org/) are committed to providing the highest quality value and safety in healthcare.

The Joint Commission has solicited input from stakeholders (health professionals, health care provider organizations, hospital associations, and health care consumers) to research the most common opportunities for improvement in patient outcomes. It has also worked with the CMS on core measures. Core measures are referred to as quality tracking and treatment based on the best evidence-based practices to achieve better patient outcomes. The results in the creation of one common set of measure specifications are documented as the *Specifications Manual for National Hospital Inpatient Quality Measures.* This Manual contains measure information, forms, and algorithms. Its goal is to focus on the use of data to improve the healthcare delivery process.

Input from TJC about the need to improve nursing efficiency and effectiveness supports the project statement that suggests improving the nursing process can impact the

financial status of the nation by improving patient outcomes and decreasing healthcare expenditures.

The glycemic control after cardiac surgery sample was used to prove that applying Deming's philosophy to the nursing profession can improve the healthcare service. Through this training, nurses can improve their process as main operators of the procedure with quality tools for continuous improvement focused on meeting customer expectations.

An analysis presented in Table 5 shows results of CMH glucose control data. In 2011, an audit of 6 a.m. blood glucose measurements for CABG post-operation days 1 and 2 at the Community Memorial Hospital (CMH) revealed that nine instances out of 120 patients had blood glucose testing that exceeded the 200 mg/dL maximum. This resulted in 93% compliance for that particular year. In January and February of 2012, blood glucose control dropped to 86.5% (Community Memorial Hospital, 2012). Those outcomes were below the national average; thus, strategic measurements were needed to improve blood glucose control and prevent surgical complications. Uncontrolled hyperglycemia compromised patient outcomes with complications such as decreased customer satisfaction and/or lower payments made to the hospital for cardiac surgeries. Most importantly, it increased patient co-morbidities and mortality risks.

Table 5

*CMH Glucose Control Data*

| | 2011 | January 2012 | February 2012 |
|---|---|---|---|
| CVS Glucose controlled | 93% | 83% | 90% |
| Numerator | 111 | 10 | 9 |
| Denominator | 120 | 12 | 20 |

*Note*. In January and February 2012, the blood glucose core measure dropped to 86.5% below state and national average. Data provided by Community Memorial Hospital, 2012.

W. E. Deming was born in Iowa in 1900 and graduated from the University of Wyoming with bachelor's degree in electrical engineering in 1920. In 1925, Deming earned his master's degree in mathematics and physics from University of Colorado, in 1928, earned his doctorate degree in mathematical physics from Yale University. In 1950, Deming was invited by The Union of Japanese Scientists and Engineers to teach the application of statistics to improve the quality of their products. Subsequently, Deming returned several times to Japan as a consultant and teacher for top Japanese leaders. Also in 1951, The Union of Japanese Scientists and Engineers established the Deming Prize for persons and businesses for achievements in quality control.

In 1955, Deming received the Shewhart Medal Award from the American Society for Quality Control for outstanding leadership in modern quality control. Deming had high respect for his mentor and friend Walter Shewhart. In 1960, Deming was awarded the Second Order Medal of the Sacred Treasure by the Emperor of Japan. This award was given to Deming in recognition for his ideas and contribution to the success of the

Japanese industry. In 1987, President Ronald Reagan awarded Deming the National Medal of Technology in recognition for his contribution to a management philosophy that has resulted in quality improvement. During his life, Deming received many awards in recognition of his work in statistics and quality control, but he is best known for developing Deming's 14 Points for Quality Management, first published in his book, *Out of the Crisis,* in 1986.

In *Out of the Crisis*, published in 1986, Deming introduces and explains his 14 Points for Quality Management in full. Roots for his 14 Points theory can be observed as early as 1950 during his lectures in Japan. Those lectures have emphasized the responsibility of management for ensuring quality and meeting customers' expectations. Deming's book (1986), presents his points as principles for transformation, and these principles are closely related to the transformation needed in healthcare. Deming emphasizes that transformation can only be achieved by human resources and not by technology. In this project, Deming 14 Points are applied to nurses as the human resources to achieve transformation in the healthcare industry.

It can be concluded from Deming's biography that Deming's 14 Points philosophy is the result of at least 40 years of thinking, learning, teaching, sharing, and improving management principles to attain success in any industry that serves human resources as employees and customers; therefore, Deming's 14 Points philosophy has been chosen for this project. Implementing Deming's philosophy as part of the nursing profession can provide a complete theory for continual improvement of the profession and its processes. This project assesses each point in its relevance to the nursing

profession. Finally, an evaluation of the results from the implementation of Deming's philosophy to the nursing profession can be accepted as a potential solution to improve patient outcomes and decrease healthcare expenditures.

Deming's 14 Points for Quality Management is used as a reference for the project that is the focus of this paper. Each point is connected to the nursing profession by given examples that explain how each point relates to nurses.

Deming's 14 Points have all the concepts to transform the current nursing profession into a profession that can generate change and improvement in today's complex healthcare industry. These points can be applied anywhere, and this includes a service industry such as healthcare. Deming's philosophy also can apply in any department within the organization, and they are timeless and limitless. As a result, Deming's 14 Points for Quality Management (1986) that follow can be applied to any industry or personal lives to achieve continual improvement:

1. Create a constant purpose toward continual improvement to become competitive and stay in business.
2. Adopt a new philosophy, which means nurses must confront the challenge and learn their responsibilities while taking leadership to make a change.
3. Stop dependence on mass inspection to achieve quality.
4. Minimize the use of suppliers to a single supplier for any one item. End the practice of awarding contracts based on the price tag. Instead, build strong and loyal relationships with a supplier while creating beneficial contracts for both organizations.

5. Improve continuously and forever.

6. Implement training on the job. Use training tools to prepare employees to train each other.

7. Implement leadership. All resources and environments should be provided to support people in doing a better job.

8. Drive out fear.

9. Break down barriers between departments.

10. Eliminate the use of slogans and exhortations by asking for zero defects and unrealistic expectations of productivity.

11. Eliminate numerical targets. Eliminate working towards numerical goals and focus on working towards quality.

12. Allow pride of workmanship.

13. Support education and self-improvement.

14. Transformation is everyone's job. (pp. 24-90)

Throughout the years, Deming's 14 Points philosophy has evolved beyond its final presentation in 1986. Founded by Deming in 1993 just a few months before his death, the W. E. Deming Institute shares the timeless teachings of Deming with new generations in efforts to continue his legacy of quality control and successful management techniques (W. E. Deming Institute, 2012).

# CHAPTER 3

# METHODOLOGY

The methodology used in improving the nursing process was based on the research regarding the quality of service, an efficient management system, and the course assignments completed throughout the author's pursuit of a Master of Science in Quality Assurance degree.

This project focused on improving a nursing process, blood glucose control, after cardiac surgery. Participants in this project studied the elements of the nursing process and discussed implementation of a quality management system in a nursing process. The goal was to implement a quality management system philosophy in the coronary care unit. This new philosophy could improve the nursing process by supporting the main idea of the project statement. Deming's philosophy was applied to the project by implementing his 14 Points for Quality Management, which was based on his teachings. Deming's teachings emphasized the philosophy that everyone in the organization should become involved in the success of the organization by providing the best possible service to the customer. All of Deming's 14 Points were connected to the nursing profession to show the relevance of Deming's philosophy. Data from Medicare reports would be used as evidence of the results from this project.

## The Nursing Process

The nursing process is composed of five elements: assessment, diagnosis, planning, implementation, and evaluation. Assessment is recognized as the collection and

analysis of holistic characteristics unique to each patient. This includes a patient's clinical presentation as well as the socio-cultural, spiritual, economic, psychological, and educational understanding of their disease process and support systems. For example, managing a hospitalized patient's unstable blood glucose includes the assessment of the cause, in addition to the patient's coping skills and physical response to the illness.

Diagnosis is characterized by the nurse's education, experience, and clinical judgment of the patient's needs. The diagnosis is the framework of the nurse's plan of care.

Planning is connected with the patient's baseline condition and current clinical presentation. It incorporates both short and long-term goals. For example, a short-term goal can consist of controlling and maintaining blood glucose less than 200 mg/dL for at least 48 hours after surgery. A long-term goal can be to prevent surgical infection due to uncontrolled hyperglycemia.

Implementation of action pertains to the plan of care with appropriate documentation, which maintains communication with all related health professionals.

Evaluation is the assessment of the patient's response to the treatment and the effectiveness of the nursing intervention. The plan of care is then modified to meet the ongoing needs of the patient.

In every phase of the nursing process, there is potential for a process breakdown without the application of a standardized model that ensures and maintains high quality management (see Figure 2).

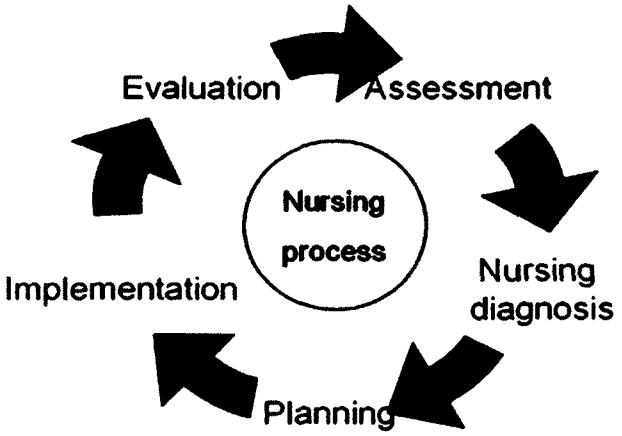



*Figure 2.* The nursing process without a quality management system. It shows a high risk for variations and process breakdown.

The current nursing processes are based on an implied element of trust, where the most appropriate steps to treat patients are followed by all nurses. If the process is standardized, measured, and reported, the profession has the potential to achieve and maintain a level of high quality with a predictable level of consistency.

## Plan-Do-Check-Act

The Plan-Do-Check-Act cycle (PDCA) methodology has been embraced by many organizations for the improvement of their service or product. This methodology is based on the Shewhart Cycle, which was made popular by W. E. Deming. Spending adequate time in each phase of the PDCA cycle is important to having a meaningful quality improvement process. The PDCA methodology involves a team approach to problem solving. Most hospitals follow the PDCA method for process improvements. In this project, Deming's 14 Points have been implemented as a new philosophy to further improve nursing processes.

The American Society for Quality auditing book discusses the phases of PDCA for improvement. The first phase, "Plan," investigates the nature of any problem to be solved while developing potential solutions to the issue at hand. The team may find that there are several opportunities for quality improvement that arise when processes are investigated. A prioritization matrix may help in determining which process to select and a problem statement can develop once the quality improvement opportunity or problem has been decided. This problem statement can be revised as needed. The measurable improvement objective is a key factor in the improvement process. It is critical to quantify the improvement by assessing if the improvement is working. It is necessary to identify the cause of the problem to ensure success with the improvement process.

Brainstorming is a useful way to identify possible causes of the problem. The 4W (what, where, when, who), 2H (how often and how much), and 1C (consequences) formula, along with drilling down, mapping the process, and a cause and effect or fishbone diagram are also useful for determining the actual root cause. Documenting an action plan with the improvement theory connects what the team expects to achieve between the plan and the measurable results. The second phase, "Do," is to implement the action plan. Part of this phase is meant to test, collect and document data, barriers, observations and lessons learned. The third phase, "Check," compares the data from before and after the improvement. Tools used to assist in analyzing the data include histograms, run charts, Pareto charts, scatter plots, and control charts. The last and final phase of the improvement cycle, "Act," determines that the improvement to adopt, adapt,

or abandon depends on the results of the data collected. Using techniques like Impact Analysis can help to choose the best solution.

The Plan-Do-Check-Act (PDCA) Cycle provides an effective approach for managing improvements. However, PDCA does not create a culture change. The nursing process and PDCA method are missing the tools and quality system for nursing empowerment. Both methods have focused on the process. However, a quality management system focuses on the process and the operators of the process in a hospital-wide system. Table 6 emphasizes finding solutions for the problem by evaluating outcomes and re-designing the plan to achieve desired outcomes, but the nursing process and the PDCA method are missing key factors for the success of any process. Key factors are the training of the operators, relationship between all the operators, and empowerment of all employees.

Table 6

*Comparison of the Nursing Process and PDCA*

| Nursing process | PDCA |
|---|---|
| Assessment<br><br>Collect data of SCIP outcomes<br>Study and understand existing situation<br>Describe current process | Plan<br><br>Collect data<br>Understand the topic<br>Understand the current process |
| Diagnosis<br><br>Define the diagnosis<br>Framework of the nurse's plan of care | Do<br><br>Define the problem<br>Proposed potential solutions to improve the problem |
| Planning<br><br>Plan, design a SCIP process<br>Re-design the SCIP process as necessary | Check<br><br>Evaluate and validate the plan<br>Re-design the plan as necessary |
| Implementation<br><br>Interventions according the plan of care and communication to other health professionals | Act<br><br>Implement the proposed process and evaluate results |
| Evaluation<br><br>Evaluation of patient outcomes. Re-design the plan of care to achieve desired outcomes as needed | Repeat the PDCA cycle<br><br>If the new process was not successful, learn from the trial and adjust the plan to overcome problems |

*Note*. This chart was prepared by the CMH team when developing the quality model for nursing.

The quality assurance profession offers effective tools in improving critical processes. Deming's 14 Points have been applied to improve the quality of businesses regardless of size or type of service.

## Recommendations to Improve the Nursing Profession

Recommendations from entities such as the Robert Wood Johnson Foundation and the IOM are changing the traditional relationship between top management and frontline. Encouraging a higher nursing education degree and supporting nurses' empowerment to participate with daily operational decisions that impact their work can improve patient outcomes. After all, nurses are the performers in the "moment of truth" and experts of the process in their line of work. Furthermore, healthcare organizations such as medical and nursing associations and government agencies, have recommended the transformation of the nursing profession to a higher level of performance and involvement. The new recommendations are asking for a more highly educated nursing workforce and involvement with quality improvement and safety issues, for the largest healthcare workforce, nurses, are in the unique position to generate and maintain change. Following those recommendations, this project has supported the approach of implementing Deming's 14 Points to the nursing profession.

## Deming's 14 Points

Deming's 14 Points, listed in the literature review, have been applied to the nursing profession. Each point is followed by a description of how each point relates to developing an improvement plan for nursing that is the focus of the project.

### Deming's Point 1: Creating a Constant Purpose

Nurses must be concerned with daily operations (nursing processes), and they must figure out how to improve nursing processes at the same time. They must

understand what are they doing and how to improve it. The most efficient approach to this concept is to gain knowledge and remain dedicated to improving the nursing profession. The healthcare industry is very competitive and depends on a customer's positive evaluation to stay in business. The vision of healthcare is to continually improve, and nurses play an important role in meeting the need of high quality healthcare. Management must support a nurse's education and innovation to improve the nursing service. Most of a hospital's reimbursement depends on the quality of the nursing service.

For example, nurses play a key role in the delivery of high quality healthcare service. On the front lines, nurses are the leaders for following core measurement guidelines. The Joint Commission and CMS measure the quality of the healthcare service through the core measures. Core measures are a set of practices or treatments developed by health experts with the best interests of reducing hospital complications and re-admissions. The core measure discussed in this project deals with the surgical care improvement project (SCIP). The SCIP is a set of guidelines that hospitals follow to reduce the risk of infection after surgery. Failure to follow all guidelines of the core measure decreases hospital reimbursement for the service provided. Nurses at the hospital setting can improve compliance with the SCIP measure by using innovate collaborations.

Deming's Point 2: Learning
Changed Responsibilities

Improvement is endless. It is crucial to embrace a philosophical focused on continual improvement aimed at meeting societal changes. The nursing profession is in an era in which it must adopt a set of ideas proven to guide and be successful in creating a culture that increases the quality of the service. In addition, since new people continue

coming to the organization, everyone should follow the same ideals and training. Customers today are well informed about the changes in every industry and expectations are high. The new philosophy should benefit every stakeholder to meet everyone's expectations and needs. The healthcare revolution for high quality service affects everyone at all levels. It is each organization's responsibility to adopt a philosophy that supports improvement, decreases costs, and creates beneficial relationships among all parties involved. For example, nurses are viewed as a key factor in improving healthcare outcomes. Adopting Deming's 14 Points in the nursing profession can empower nurses with the tools to success in the challenge of meeting all customer expectations. By creating a culture of quality management systems within the nursing profession, these expectations can be met.

### Deming's Point 3: Stopping Inspection Dependence

Developing quality into the service from the start of the process can greatly help ensure higher results, and the use quality tools is a must for determining if the process is working. Mass inspection is deceiving because people act differently when they are being observed. Building a process to ensure quality and supporting a personal responsibility to do the right thing is more effective when compensating for human factor limitations. An inspection searches for mistakes that possibly have already affected some customers. A common phrase in quality when a mistake is found is, it is not the person; it is the process. Processes should be improved as the result of findings from statistical data and not by inspecting people. In other words, it's better to evaluate results of the process to ensure quality control.

For example, a supervisor can't inspect every time a nurse has an interaction with a patient, such as checking the blood glucose after cardiac surgery. Instead, outcomes from the process can be evaluated and then improved to reach the desired outcome. According to the 2014 SCIP guidelines, it is expected that between the 18 to 24 hours following the end of anesthesia time, the blood glucose level is less than 180 mg/dL. Data is evaluated quarterly and fallouts are followed by a root cause analysis to identify the need for improvement of the process.

### Deming's Point 4: Using Single Suppliers

Suppliers should become your partners and share similar philosophies of quality service. They should be knowledgeable about your customer's expectations and provide the quality that is expected. By working together, variation should decrease while quality is increased and cost is minimized. Since nurses perform many interventions that require medical supplies and equipment, they should be included as part of the supplier selection by giving feedback on the product or service. Nurses must have the right supplies to provide a high quality service; otherwise, the service results in poor quality.

For example, a hospital was using a clear plastic graduated container with white color numbers for less cost. Nurses explained to management that this product did not meet expectations because it was difficult to read the numbers and report accurate volume. Management discussed the nurses' feedback with suppliers and changed to clear plastic graduated containers with black numbers to meet the nurses' expectations of the product.

Deming's Point 5: Continuous Improvement

In healthcare, there are many processes, expectations, and customers, making the need for improvement endless; the key to quality service is constant improvement. Every year, there are new guidelines of quality in healthcare, and continuous improvement is imperative to stay in business. Developing a strategy to promote innovation for continuous improvement by understanding the cause of defects and how to fix those defects can help empower the employees and operators of this process. Everyone's participation for the improvement of the processes helps increase the sense of ownership and productivity. In other words, understanding customer requirements, training the right people for the job, and supporting employees with the proper resources can result in less cost, higher productivity, and continuous improvement.

For example, although CMS sets the desired outcome for the SCIP measure, it does not tell health providers how to develop processes in order to achieve the desired outcomes. Each organization designs, analyzes, and improves the process that works best for the overall system within the organization. As the operators of the process, nurses are in the position to observe the results of the process first-hand and suggest improvements.

Deming's Point 6: On the Job Training

Training colleagues helps promote a healthier work environment. On-the-job training gives employees a feeling of contribution for the professional improvement of others, and their success ultimately becomes yours. People learn in different ways, and being trained by colleagues who know an individual's personality and potential is a way

to ensure high quality learning. Training on the job also helps the employee become familiar with the culture and environment of the workplace. Familiarity with one's surroundings can promote innovative ideas for increasing quality, productivity, and teamwork. Continued assessment of on-the-job training needs for employees helps increase the quality of the service. Training employees at all levels to understand the daily operations and variations can result in higher productivity.

For example, because nurses work together in 8 to 12 hour shifts, they get to know each other's potential for advancing to the next training level. On-the-job training to become a cardiac nurse at the coronary care unit should embrace a system in which experienced cardiac nurses train others to achieve this level of expertise while promoting each other's professional growth.

Deming's Point 7:
Implementing Leadership

Empower and support employees to do a better job. Leaders should know and understand employees and the job they do in order to achieve the desired results. Detrimental conditions that can compromise positive outcomes in healthcare can be avoided by keeping quality in mind and focusing on everything that has to be achieved. It is the leader's job to lead by reinforcing the vision of the organization and its commitment to their customers. Leaders should also verify that the job is done as expected and encourage employees to meet customers' expectations. Managers should be knowledgeable about the nurse's job while providing the right training and supplies needed to maintain the best service. Lastly, nurses should be guided and empowered to improve the process, for they are the main operators of this process.

For example, a nurse manager evaluates the outcomes of the SCIP measure to identify needs for process improvement. Frequent evaluation of outcomes allows for prompt solutions, which helps improve the quality of the service. Proactive leadership serves as a role model for all employees by maintaining the connection between employees and leaders.

Deming's Point 8:
Driving Out Fear

Without fear, everyone feels free to express his or her ideas and concerns. It is important to develop a culture built on the need to improve processes without blaming other people when errors happen. Use open door communication policies to remove fear from employees and reach out to leaders to support continuous improvement and work effectively. In order to produce high quality employees, employees need to develop confidence and trust in the leadership group. Nurses should speak out and bring up concerns about the process, suggesting possible solutions to move forward efficiently. As the performers of the process, nurses are in the position to assess results of the process immediately and prevent future fallouts. For example, nurses know that the blood glucose level between the 18 to 24 hours following the end of anesthesia time of post-cardiac surgery must be kept under 180 mg/dL. If a blood glucose level greater than 180 mg/dL occurs, a physician is notified immediately, and further action to control the blood glucose level is activated.

Deming's Point 9: Breaking Down Barriers

Every department should strive to work together since each department depends on another to provide service to its customers. In other words, work as a system and avoid brainstorming ideas that can only work to address one department's needs and benefits. People in different departments such as laboratory, nursing, financial, human resources, and marketing, must work as a team to identify potential service problems and find solutions that are beneficial to the organization as a system and not solely for the prosperity of one department. Cooperation among departments benefits everyone in the organization and avoids competition between members. Departments need to understand who their internal customers are and improve cooperation between them.

The collaboration between the nursing and medical staff in developing the blood glucose protocol after cardiac surgery is necessary for the success of the SCIP measure. The surgical department communicates to the coronary care unit at the end of anesthesia to establish the critical time for blood glucose control by CMS. Without the collaboration between departments, positive results regarding the processes are not feasible.

Deming's Point 10: Eliminating Slogans & Unrealistic Expectations

Be clear and reasonable on what is expected and how to achieve it. Asking for zero defects can increase pressure, which can result in employees forgetting about the purpose of quality and teamwork. When systems are created to include quality in every aspect of the system, everything begins to fall into place, avoiding the need to ask for the unreachable when quality has been already compromised. Nurses are constantly under

pressure to do a better job because reimbursement depends on high quality nursing service. However, until management improves and supports nursing processes, outcomes cannot improve.

Leaders are the owners of the process; nurses are the operators of the process. First, management has to design a procedure that has cleared out all of the possible variations. A simple process that avoids possible fallouts has quality built into it. The SCIP process is designed to take all nursing activities that occur around this process into consideration. A nurse cannot focus solely on the critical time of this measure, which occurs 18 to 24 hours after the end of anesthesia time, if other activities occur simultaneously. Therefore, when a process is falling out, suggestions from the operators of the process should be taking in consideration when redesigning the process.

Deming's Point 11:
Eliminating Numeral Targets

When the focus is set on saving costs rather than promoting quality, it results in higher waste and less productivity. On the other hand, a system that fosters continual improvement results in higher productivity and lower costs. In order to increase productivity, the proper steps must be taken when analyzing and improving the process. Before management begins to increase productivity, there must be a well-developed method thought out to work towards that goal without over demanding productivity to reach their target.

Designing a simple process decreases variations and waste and increases productivity. Delegating non-nursing activities, such as answering the telephone or

passing meal trays to other personnel, allows nurses to focus on controlling blood glucose levels during the critical time of the SCIP measure determined by CMS.

Deming's Point 12: Allowing Pride of Workmanship

Everyone in the organization must be allowed and encouraged to take pride in their work without being compared or minimized. Avoid competition among co-workers for rewards. Eventually, a system focused on quality can elevate and maintain everyone's level of competency in the same realm. Leaders limiting the pride of one's work results in a low morale in the workplace. If a nurse's performance is not acceptable, a root cause analysis can reveal the reason why the process is failing, not why the individual is not succeeding. When corrected, reasons such as deficient education, inadequate training, or low morale can result in a job well done.

Deming's Point 13: Allowing Pride of Workmanship

Any organization's most resourceful employees carefully prepare to successfully perform a job at the best of their ability. Educated employees are better prepared for the future challenges. Healthcare has been confronted with many changes that require a higher education level at all positions within the organization. Nurses have been identified as key members of the healthcare industry with their ability to generate change and improvements. It is crucial to elevate a nurse's education level in order to obtain better results in increasing the quality of healthcare. Well-prepared nurses should be given the opportunity to give more to the organization. For example, many recommendations for the future of nursing suggest a baccalaureate degree as the entry

level for nursing. It is expected that by the year 2020, at least 80 percent of the nursing workforce will hold a baccalaureate degree.

## Deming's Point 14: Transforming Everyone's Job

Everyone in the nursing department should be committed to the transformation of the nursing profession. Personal responsibility for transformation and improvement of the nursing department can only be achieved by reinforcing Deming's 14 Points throughout the entire organization. In other words, management should understand the previous 13 points and train those with leadership capabilities around the organization with concrete plans for addressing them. The nursing department is the largest department in the hospital setting, and they are the main operators providing a service directly to their primary healthcare customers, the patients. As mentioned before, mass inspection should be avoided. All nurses are responsible for providing high quality service. Quality has two concepts. These include having leaders provide a system with quality built into the process while the operators perform with quality built into their actions.

# CHAPTER 4

## RESULTS AND DISCUSSIONS

The results from the project clearly indicate that applying Deming's 14 Points to the nursing profession and nursing process can improve patient outcomes and embrace continuous improvement, which is the main purpose of the healthcare industry. The results and discussions focus on: (1) the evaluation of the SCIP blood glucose control after empowering nurses with Deming's 14 Points, (2) an analysis of Deming's 14 Points as they apply to the nursing profession, and (3) the benefits of empowering and improving the largest group of health professionals. Deming's 14 Points can be applied to any business–manufacturing or service; however, being able to improve patient outcomes, prevent complications, and decrease hospitalization days and costs while exceeding all stakeholders' expectations is not an easy challenge.

Many important entities in the healthcare industry have voiced the need to increase a nurse's education, training, and empowerment to improve patient outcomes and decrease healthcare expenditures. Applying Deming's 14 Points to a nursing process has been identified as a potential approach to improving the nursing profession. The healthcare industry can present many variations; therefore, developing a nursing workforce that is prepared to face the challenges can significantly improve patient outcome and the healthcare industry. In the implementation of Deming's 14 Points, the most critical point is to identify the function of the nurse as it relates to each point. Each point must connect to the nursing profession in order to embrace professional growth. Of

course, the transformation is not feasible without the support of the organization's leaders and their commitment to addressing the new challenges of the nursing profession.

One key to empowering nurses that has been discussed is collaboration between the main operators on the front line. Typically, nurses report a patient's change in status to physicians while the physicians strategize a new plan of care guided by the patient's status. Elevating the nurses' status to a level in which their input is valued and considered in the design of their patients' plan of care for a faster recovery is the goal in the healthcare future.

The first step in the implementation of the project was to break down the barrier of communication between the nurses and the cardiothoracic surgeons. Discussions between the main operators on the front line were crucial to enhancing collaboration and accepting the suggestions from nurses to physicians. However, there was still the need for improving a common purpose, which was to outline the improvement of the SCIP blood glucose control after cardiac surgery. Compliance with CMS guidelines was important to improve the patient's outcome, remain competitive, and maintain reimbursement for the service.

Second, Deming's 14 Points for quality management was adopted for this project. The philosophy was applied to the nursing profession since the department was the largest hospital department and nurses were the main operators of customer care.

Third, nurses were empowered to evaluate the problem and suggest solutions to improve outcomes. The nurse was given autonomy to proceed with this project.

Fourth, the nurse researched all customer expectations, along with the root cause analysis of the fallouts and a possible solution to the problem such as a new protocol to decrease variations. This collaboration reinforced the professional relationship between the nurse and the surgeon.

Fifth, the nurse presented a new protocol to the cardiac thoracic surgeon for improving the process of controlling blood glucose. The surgeon approved it after a close evaluation of the proposed protocol. The new protocol was simpler with less variation, making it easier to follow. All cardiac nurses were trained with the new protocol by explaining the purpose and desired outcomes while providing a detailed outline on the CMS guidelines for the SCIP measure.

Sixth, nurses were supported with the new process and encouraged to provide suggestions to improve the new protocol. The open communication and respect for nurses' suggestions reinforced the collaboration and professional comfort between other nurses and physicians.

Seventh, the project was extended from the coronary care unit to the surgical department. Clarification of the process between the departments was reinforced to establish each party's participation and motivate collaboration between the departments to reach this common goal.

Eighth, there was no pressure to achieve zero defects. The focus was mainly on improving the quality of the service and the benefits for the patients.

Finally, by supporting the nurses' participation and professional growth, an enhanced feeling of ownership for the project helped motivate the participation of all

cardiac nurses involved in the project. Also, other nurses who observed the new approach to process improvement through the collaboration between nurses and physicians were motivated to give feedback and suggestions. The positive outcome of collaboration among health providers was an improvement in itself.

Although the primary focus was on the SCIP measure improvement, the working environment and collaboration among health providers also improved. Results from this project were above the California state and national average in compliance with the SCIP blood glucose control measure for two consecutive years. The new protocol was introduced in March 2012, and outcomes were followed throughout December 2013. Implementation of Deming's 14 Points for the blood glucose management after cardiac surgery resulted in a significant improvement from 86 % to 99 % compliance with the SCIP measure. In 2013, compliance was maintained at 100 %.

Although CMS changed the SCIP blood glucose control guidelines in 2014, an analysis showed a drop of SCIP compliance to 96 %, still within the California and national average. A new protocol was designed following CMS 2014 guidelines for glucose control after cardiac surgery; however, the 2014 guidelines were not part of this project. This project was based on the period from January 2012 to December 2013.

The Quality department of the hospital congratulated nurses and surgeons for the significant improvement of the core measure. The implementation of Deming's 14 Points for the nursing profession appeared to be effective and successful, evidenced by CMS data (see Table 7).

Table 7

*Hospital Compare – Surgical Care Improvement Project*

| SCIP Measure Data | CMH Jan. 2012 Mar. 2012 | CMH April 2012 Dec. 2012 | CMH 2013 | CMH Jan. 2014 March 2014 | California Average 2012-2014 | National Average 2012-2014 |
|---|---|---|---|---|---|---|
| | 86% | 99% | 100% | 96% | 94-96% | 94-96% |

*Note.* Medicare public record data of blood glucose control after cardiac surgery. Heart surgery patients whose blood sugar (blood glucose) is kept under good control in the days right after surgery. Higher percentages are better.

The CMS recognizes and emphasizes the importance of achieving a better blood glucose control after cardiac surgery. This common but challenging quality measure still remains an important factor in decreasing cardiac surgery complications and hospital reimbursement for surgical services. The SCIP measure was added as a core measure in 2003. Twelve years later, the SCIP measure remains an important core measure that keeps improving to reach better outcomes (The Joint Commission, 2015).

# CHAPTER 5

## SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

*New product and new types of service are generated, not by asking the consumer, but by knowledge, imagination, innovation, risk, trial and error on the part of the producer, back by enough capital to develop the product or service and to stay in business during the learn months of introduction.*
*Deming*

This project focused on implementing a quality management philosophy for the nursing workforce in the coronary care unit. Deming's 14 Points provided the framework for a quality management implementation and culture change. The nursing workforce needed a new philosophy to better meet the challenge of improving the current healthcare system. The project also was designed to be a guide for various organizations that employ nurses.

These organizations include hospitals, clinics, schools, nursing homes, public health facilities, home health, research, and community services. Currently, healthcare leaders are responsible for increasing the quality of healthcare services while decreasing healthcare expenditures. The implementation of Deming's 14 Points for the nursing workforce is intended to support and guide leaders in meeting the challenges of increased healthcare quality and decreased costs.

This project identified the need to improve and empower the nursing workforce. Healthcare organizations recognized that the nursing profession was a key force in the healthcare system. Healthcare organizations demanded improvement of the quality of the

healthcare service. These organizations represented the voice of the customers at various levels, including patients, health providers and third-party payers. The project identified Deming's 14 Points as a potential solution for meeting customers' demands and improved the nursing workforce.

This project also discussed the process for applying Deming's 14 Points into a specific nursing process, focusing upon important core measure and outcomes after its implementation. Deming's 14 Points were implemented in a nursing process at the CMH coronary care unit. The SCIP core measure and blood glucose control was to be compared before and after the implementation of the new philosophy into the nursing process. The blood glucose data was followed from January 2012 to December 2013 after the implementation of the new philosophy. Deming's 14 Points were implemented during the first week of April 2012.

Data were processed from quarterly and yearly summaries of Medicare administrative records, comparing each hospital's core measure outcomes with the state and national average. The CMH data from the first quarter of 2012, the last three quarters of 2012, the four quarters of 2013, and the first quarter of 2014 were collected. Data results from before and after the implementation of Deming's 14 Points were compared. The implementation of Deming's philosophy resulted in a significant improvement from 86 % to 99 % compliance with the SCIP measure. In 2013, compliance was maintained at 100 % throughout the year.

The implementation of Deming's 14 Points for the nursing workforce is an on-going process and requires a culture change. Results from the project have identified

Deming's 14 Points as a successful philosophy to improve the nursing workforce and healthcare outcomes. The philosophy also requires change in management techniques. In conclusion, Deming's 14 Points provides a philosophy that supports continual improvement of the nursing workforce, processes and outcomes.

Healthcare is characterized by continual improvement because it requires continuous improvements along with new treatments and technology in the healthcare industry. Organizational research and application of Deming's 14 Points may help to ensure that healthcare meets requirements for a culture change within the organization in general and generates specific change within the nursing workforce. This project's findings recommend that Deming's 14 Points be implemented as an organization-wide philosophy. Without organizational leadership's commitment for change, change is not possible. Finally, health providers need to understand the importance of quality. Without employees' loyalty and healthcare leaders' constancy in following the requirements of a quality management system, high quality is difficult to obtain and maintain. In order to cultivate high quality healthcare service, the commitment of all stakeholders is crucial to the success of the healthcare service.

# REFERENCES

# REFERENCES

Agency for Healthcare Research and Quality (2013). *Costs for hospital stays in the United States in 2010.* Retrieved from http://www.hcup-us.ahrq.gov/reports/statbriefs/sb146.pdf

Birkmeyer, J., Gust, C.,Dimick, J.,Birkmeyer, N., & Skinner, J. (2012). Hospital quality and the cost of inpatient surgery in the United States. *Annals of Surgery*, (255), 1–5.

Retrieved from www.annalsofsurgery.com

Clancy, C. (2012). Alleviating "second victim" syndrome: How we should handle patient harm. *Agency for Healthcare Research and Quality.* Retrieved from http://www.ahrq.gov/news/newsroom/commentaries/second-victim-syndrome.html

Deming, W. E. (1986). *Out of the crisis. 14 points for management.* Cambridge, MA: Massachusetts Institute of Technology, Center for Advanced Engineering Study.

Dolansky, M., & Moore, S. (2013). Quality and safety education for nurses (QSEN): The key is system thinking. *The online journal of issues in nursing.* Retrieved from http://www.nursingworld.org/Quality-and-Safety-Education-for-Nurses.html

Green, A., & Buckler, L. (2013). Using dedicated nurses to improve core measures. http://www.researchgate.net/publication/260022445_Using_Dedicated_Nurses_to_Improve_Core_Measures_Compliance

Hassmiller, S. (2010). *Nursing's role in healthcare reform.* Retrieved from http://www.americannursetoday.com/article.aspx?id=7086&fid=6850

Hassmiller, S. (2012). *Nurse leaders in the boardroom: A fitting choice.* Retrieved from http://www.thefutureofnursing.org/sites/default/files/JHC%20Hassmiler,%20Combes%20Jan.Feb%202012_0.pdf

Health Human Services Office of Inspector General. (2010). *Adverse events in hospitals: National incidence among Medicare beneficiaries.* Retrieved from http://oig.hhs.gov/oei/reports/oei-06-09-00090.pdf.

Hughes, R. (2008). Patient safety and quality: An evidence-based handbook for nurses. *Agency for Healthcare Research and Quality.*

Ketola, J., & Roberts, K. (2009). *Correct! Prevent! Improve!* Revised edition. Milwaukee, WI: American Society of Quality Press.

Lagoe, R., Johnson, P., & Murphy, M. (2011). Inpatient hospital complications and length of stay: a short report. PMC US National Library of Medicine. *National Institutes of Health.* Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3098808/

Lazar, H. (2012). Glycemic control during coronary artery bypass graft surgery. *Department of Cardiothoracic Surgery.* Retrieved from http://www.hindawi.com/isrn/cardiology/2012/292490/

Matthews, J. (2012). Role of professional organizations in advocating for the nursing profession. *A Scholarly Journal of the American Nurses Association.* http://nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/

Medicare hospital compare. (2014). Retrieved from http://www.medicare.gov/hospitalcompare/search.html

Medicare. (2013). *The U.S. government site for care*. Retrieved from http://www.medicare.gov/HospitalCompare/details.aspx?msrCd=Prnt2

Needleman, J., & Hassmiller, S. (2009). The role of nurses in improving hospital quality and efficiency: Real-words results. *Health Affairs, 28*(4). ProQuest.

Risnes, I., Abdelnoor, M., Almdahl, S., & Svennevig, J. (2010). Mediastinitis after coronary artery bypass grafting risk factors and long-term survival. *The Annals of Thoracic Surgery.*

Russell, J. (2012). *The ASQ auditing handbook* (4th ed.).. Milwaukee, WI: American Society for Quality.

Society of Thoracic Surgeons. (2009). Additive costs of postoperative complications for isolated coronary artery bypass grafting patients in Virginia. *The Annals of Thoracic Surgery*. Retrieve from http://www.sts.org/annals-thoracic-surgery

Swensen, S., Meyer, G., Nelson, E., Hunt, G., Pryor, D., Weissberg, J.,...Berwick, D. (2010). Cottage industry to postindustrial care: The revolution in health care delivery. *New England Journal of Medicine*, 362,1-4.

The American Nurses Association. (2013). *The nursing process*. Retrieved from https://www.nursingworld.org/What-is-Nursing

The Florence Nightingale Foundation. (2014). Retrieve from http://www.florence-nightingale-foundation.org.uk/

The Institute of Medicine. (2010). The future of nursing: Leading change, advancing health. Retrieved from http://www.iom.edu/Reports/2010/The-Future-of-Nursing-Leading-Change-Advancing-Health.aspx

The Joint Commission. (2010). Retrieved from http://www.jointcommission.org/assets/1/18/RWJ_Future_of_Nursing.pdf

The Joint Commission. (2013). *The specifications manual for national hospital inpatient quality measures. Surgical care improvement project.* Retrieved from http://www.jointcommission.org/specifications_manual_for_national_hospital_inpatient_quality_measures.aspx

The Joint Commission. (2010). *Testimony submitted by the joint commission.* Retrieved from http://www.jointcommission.org/assets/1/18/RWJ_Future_of_Nursing.pdf

The Joint Commission (2015). *Core measures set. Surgical care improvement project.* Retrieved from http://www.jointcommission.org/core_measure_sets.aspx

The W. Edwards Deming Institute. (2012). *Deming the man-timeline.* https://deming.org/theman/timeline

# APPENDICES

# APPENDIX A

# IMPLEMENTING DEMING'S 14 POINTS TO A NURSING PROCESS PLAN

# IMPLEMENTING DEMING'S 14 POINTS TO A NURSING PROCESS PLAN

A project by

Pilar Parker

2015

TABLE OF CONTENTS

PAGE

# LIST OF TABLES

PAGE

# LIST OF FIGURES

PAGE

# INTRODUCTION

The nursing profession is based on the specific practices executed in order to reach a desired goal; however, the profession is continuously changing to meet society's needs and expectations. Nurses have been identified as a key factor in healthcare to increase patient outcomes and decrease waste. Without a quality management philosophy, improvements within the nursing profession have not reached the expected goals of increasing quality and safety within the healthcare industry. A nursing practice of blood glucose control after open-heart surgery was chosen as an improvement project due to its importance as a quality initiative that prevents serious complications after the operation. If not executed properly, this can be very costly while causing even bigger health problems.

The purpose of this project was to improve and empower the nursing craft by applying Deming's 14 Points to the craft with the support of two cardiac thoracic surgeons. Nurses were given the opportunity to prove that their input in healthcare was essential to the improvement of patient outcomes. By enhancing the methodology of the nursing process, all stakeholders' expectations were met.

It is important to keep in mind that although the following quarterly outcomes reached a 100% success rate, the improvements do no stop there. Continuous improvement means that processes can keep improving and a 100% success rate this quarter does not guarantee 100% in future quarters.

## Scope

The scope of this project was limited to blood glucose management after cardiac surgery within the Community Memorial Health System in Ventura. Collaboration between nurses and cardiac thoracic surgeons, along with an analysis of the stakeholder's expectations, a root cause examination of the problem, and the PDCA tool of the project were completed.

## Purpose

The goal for this project was to implement a quality philosophy in the nursing profession and increase the quality of the nursing service. Increasing the quality of the nursing profession would greatly improve patient outcomes and decrease healthcare costs.

## Definition of Terms

Glycemic: Glucose in the blood.

Hospital-acquired Complication: An illness acquired during hospitalization.

Hyperglycemia: High blood glucose levels.

Mediastinal: The middle of the chest area that separates the lungs.

Mediastinitis : Infection of the mediastinal incision.

Nursing Process: This process is composed of five elements: assessment, diagnosis, planning, implementation, and evaluation.

Process Approach: A desired result is achieved more efficiently when activities and related resources are managed as a process.

# Methodology

Deming's 14 Point philosophy was implemented for the nursing profession to improve the blood glucose management. The root cause analysis of the blood glucose fallouts was studied, and a new process was developed to attain the desired outcomes. The cardiac thoracic surgeons followed the recommendations of the nurses to revise the blood glucose protocol, and data of the outcomes were collected every quarter. The project included researching customer requirements, planning activities to reach goals, and finally evaluating the process' outcomes. Table 1 displays the responsibilities of each participant in the project.

Table 1

*Identifying Roles and Responsibilities*

| Role | Responsibilities |
|---|---|
| Cardiac Thoracic Surgeons | Approve project<br>Approve process changes<br>Oversee outcomes<br>Ensure customer requirements alignment with protocol changes |
| Lead Nurse | Research customer requirements<br>Research RCA of previous fallouts<br>Research insulin effects<br>Revise blood glucose protocol |
| Primary Nurse | Follow new protocol<br>Record blood glucose results<br>Suggestions for improvement of the protocol |
| ICU Manager | Draft the new protocol into a hospital form and present it to hospital committees for approval |
| Quality Department | Collect data quarterly<br>Report outcomes |

In addition, the cardiac care unit manager drafted the protocol into a hospital form to be reviewed and approved by several hospital committees. The new protocol was approved by all required leaders before it was launched.

The voice of all stakeholders (patient, families, physicians, nurses, payers, and organization) was taken in consideration by using the quality tool stakeholders' analysis to ensure that everyone's expectations could be met. Prior to the revision of the blood glucose protocol, previous fallouts were analyzed using a root cause analysis to understand the reason for the fallouts. Next, all nurses' activities during the period of strict blood glucose control (48 hours) were taken into consideration when the protocol

was designed. The protocol was developed by the lead nurse and approved by the cardiac thoracic surgeons. Cardiac surgeons are given the license and freedom to order treatment based on standards of care. Finally, the process of how Deming's 14 Points was implemented for the nursing profession is discussed. Table 2 displays the project plan, identifying the focus, scope, purpose, risks, and development of the project.

Table 2

*Project Plan*

| | |
|---|---|
| Project Name: | Nursing Process |
| Department: | Coronary Care Unit |
| Focus Area: | Post-cardiac surgery management |
| Product or Process: | Blood glucose protocol |
| Project overview:<br>This project will cover Deming's 14 Points philosophy. The philosophy guides and empowers the nursing profession to successful processes | |
| Project Executive Summary | |
| Scope | The scope of this project is limited to the Coronary Care unit of Community Memorial Health System of Ventura |
| Project Purpose | The purpose is to demonstrate that the guidance of the nursing profession with a quality management philosophy can improve the nursing service and achieve higher patient outcomes |
| Major Milestones | Obtain the cardiac thoracic surgeons' agreement to collaborate with the project<br>Obtain new protocol approval from all hospital committees<br>Determine key participant roles and timeline |

| | |
|---|---|
| | Apply each point of Deming's 14 points to the nursing profession:<br><br>Create a constant purpose toward continual improvement to become competitive and stay in business<br><br>Adopt a new philosophy<br><br>Stop dependence on mass inspection to achieve quality<br><br>Minimize the use of suppliers to a single supplier for any one item<br><br>Improve continuously and forever<br><br>Implement training on the job<br><br>Implement leadership<br><br>Drive out fear<br><br>Break down barriers between departments<br><br>Eliminate the use of slogans and exhortations by asking for zero defects<br><br>Eliminate numerical targets. Eliminate working towards numerical goals and work towards quality<br><br>Allow pride of workmanship<br><br>Support education and self-improvement<br><br>Transformation is everyone's job<br>Continue hospital PDCA method for process improvement (Point 5 – Improve continuously and forever) |
| | Analysis of new process outcomes quarterly |
| Risks | All bedside primary nurses must be educated and follow the new protocol for compliance |

| | |
|---|---|
| | Increase awareness of rare cases when patient has implanted insulin-released equipment. It will require special guidelines for glucose control |
| Approach | Analytical<br>Teamwork<br>Lead process improvement<br>Train everyone in new philosophy<br>Discuss concerns and progress |
| | Collaboration<br>Lead initiative<br>Set clear expectations<br>Evaluate outcomes periodically |
| | Coronary Care Unit<br>Develop new protocol<br>Train cardiac nurses with new protocol<br>Develop recommendations for future improvements |
| Out of Scope | Medical Floor<br>Surgical Floor<br>Hospital Laboratory |

A quarterly report for the cardiac surgical and cardiology team was scheduled to discuss blood glucose management after cardiac surgery, along with patient outcomes. Also, with every case, feedback from primary nurses was encouraged to fix problems found during the process. For example, extra steps needed to be taken on rare cases where patients were dependent on special implanted insulin-released equipment to manage blood glucose. The insulin-released equipment was turned off before surgery, causing difficulties in situations to control blood glucose. In those cases, extra blood

glucose monitoring and insulin was given to achieve the expected goal. Table 3 discusses the barriers and opportunities for improvement encountered during the implementation of the project.

Table 3

*Barriers and Opportunities for Improvement*

| Rare<br><br>Cases | Problem | Recommendation |
|---|---|---|
| Patient special needs | Difficult to control blood glucose. | Part of the process is to identify special needs and add extra monitoring and insulin coverage. |
| Nurses non-complaint with process | Core measure fallout<br>Increase risk for complications<br>Hospital lose reimbursement | Educate the importance and consequences of non-compliance with the process. |
| Patient non-compliance | Core measure fallout<br>Increase risk for complications | Educate patient on the importance for blood glucose control before and after surgery. |
| Stop improving | The process fails to identify opportunities for improvement | Evaluate process outcome periodically. |
| Poor Communication | New employees (nurse, pharmacists) using the process are not trained | Part of the process should include ensuring the operator's training.<br>Pre-printed protocol to ensure consistency. |

Data collection from Medicare reports on the Timely and Effective Care Measure was presented as testimony for outcome improvement. Significant improvements were achieved and maintained after implementing Deming's 14 Points for the cardiac nursing workforce at the Community Memorial Health System in Ventura, California.

In an effort to facilitate the understanding of Deming's philosophy and its application to the nursing profession, Figures 1 and 2 were developed. All of Deming's 14 Points were connected to the nursing profession in similar charts.

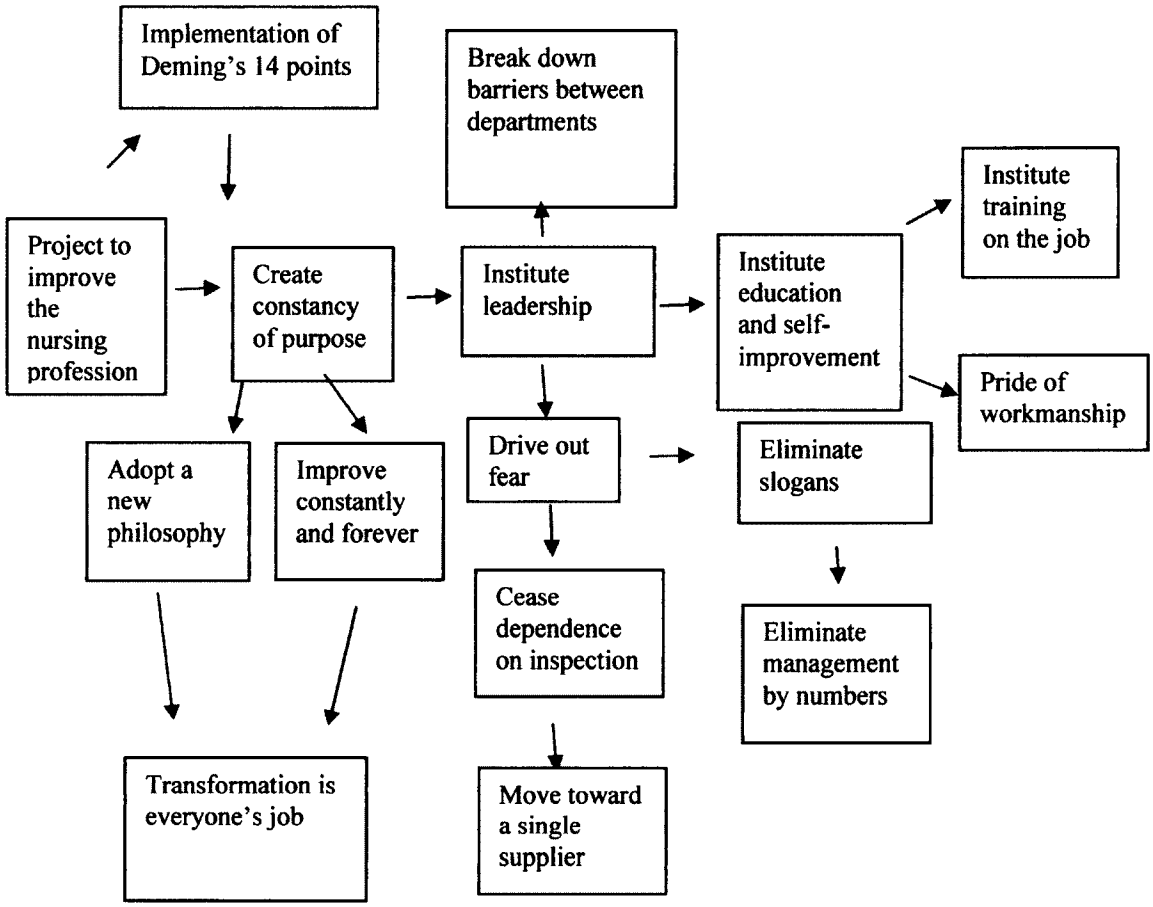



*Figure 1.* Implementation of Deming's 14 Points. An organization chart of the steps to implement Deming's 14 Points was developed to explain the new concept to healthcare providers. Adapted from *Out of the Crisis*, by Deming, 1986, pp. 24-90).

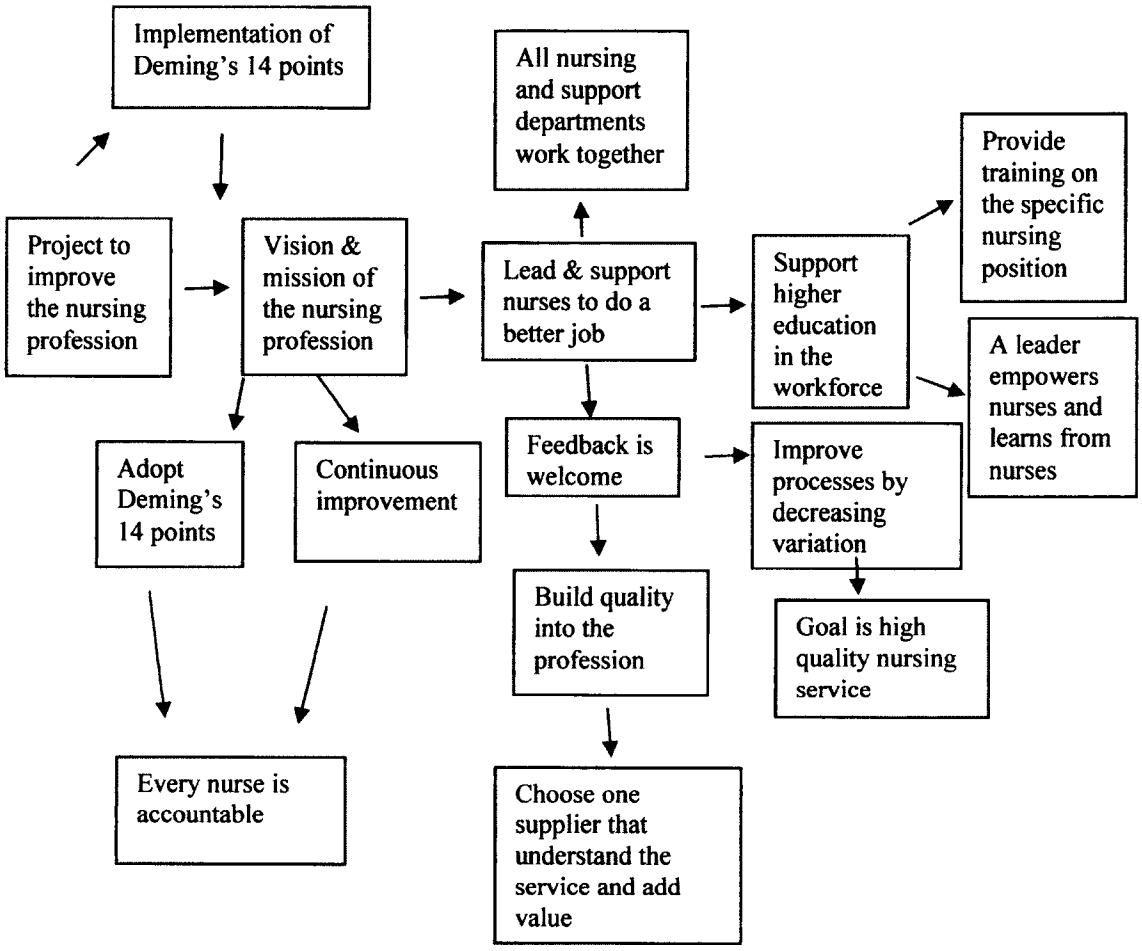



*Figure 2.* Deming's 14 Points connected to the nursing profession. Each of Deming's 14 Points is connected to the nursing profession to explain the relationship between Deming's philosophy and the nursing profession Adapted from *Out of the Crisis*, by Deming, 1986, pp 24-90.

## Implementing Deming's 14 Points in a Nursing Process

1. Create a constant purpose toward continual improvement to become competitive and stay in business (Deming, 1986, p. 24).

Nurses have become aware of all stakeholders' expectations and how important it is to keep improving the nursing service. All hospitals must follow regulations, CMS recommendations and the best practices to remain competitive and stay in business. Nurses are informed that there are new challenges and guidelines that must be met almost every two years. Continual improvement is an expectation in healthcare. For example, the SCIP guidelines that were used for blood glucose control after cardiac surgery in 2012 have changed in January 2014. Nurses at the coronary care unit are required to revise the glucose control protocol in order to follow the new 2014 guidelines. Figure 3 displays the process of continual improvement.

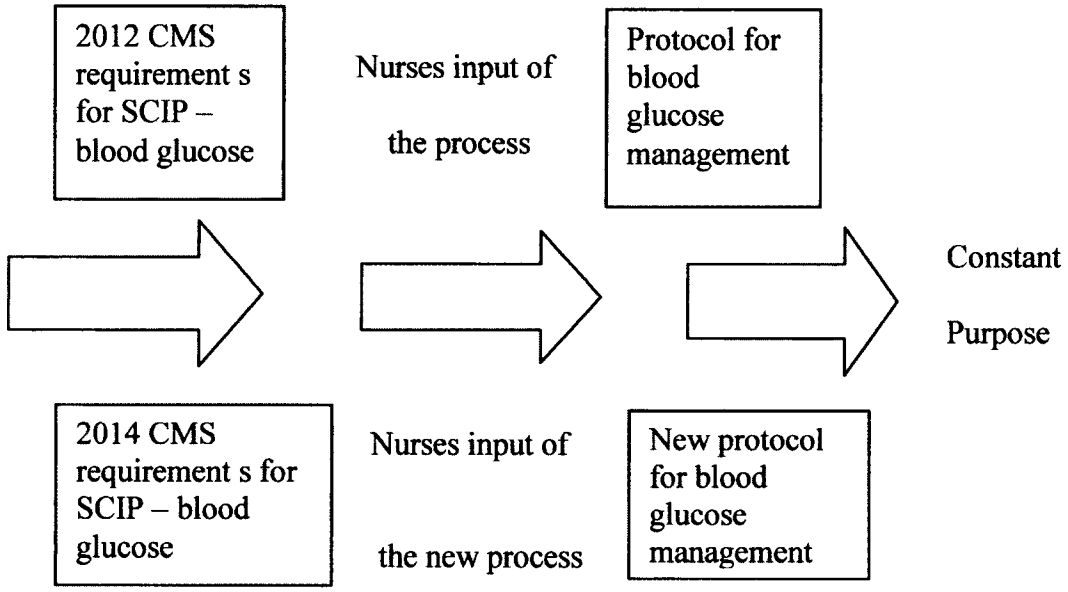



*Figure 3.* Constant purpose.

2. Adopt a new philosophy (Deming, 1986, p. 26).

Nurses must confront the challenges to meet society's expectations and take on leadership for change. The nursing profession is at an era in which it must adopt a set of ideas proven to guide and be successful in creating a culture that increases quality in the healthcare industry. Implementing Deming's 14 Points philosophy can guide the nursing profession into increasing the quality of the nursing service. In Table 4 similarities between the nursing profession founder and Deming's philosophy are discussed. The nursing profession's first philosophy for constant improvement and quality was proposed by its founder, Florence Nightingale. After 155 years, the nursing profession has not attained its full potential in the healthcare service. Perhaps, Deming's 14 Points can complete Florence Nightingale's philosophy.

Table 4

*Similarities Between Florence Nightingale and Deming Philosophies*

| Nightingale | Deming |
|---|---|
| Pioneered the use of statistical methods to analyze variation (1855) | Statistician, considered the father of Quality Control |
| Notes on Nursing (1860) | Out of the Crisis (1982) |
| Genius at change –constancy of purpose | Genius at change – constancy of purpose |
| Saw opportunities for improvement | Saw opportunities for improvement |
| Promote education and training | Promote education and training |
| Guidance for managers | Guidance for managers |
| Management principles | Management principles |
| Empower nurses | Empower employees |

3. Stop dependence on mass inspection to achieve quality (Deming, 1986, p. 28).

During a three-day hospitalization period, one patient receives around 500 or more interventions from nurses. It is not feasible to inspect the quality of the nursing service when a nurse has an average of one to five patients per shift. The best way to analyze quality is by reviewing patient outcomes from the data of nursing processes. The only way to ensure quality is by building quality into the nursing profession and processes.

For this project, Deming's 14 Points philosophy was applied to build quality into the blood glucose monitoring after cardiac surgery process. Figure 4 describes a simple approach to build quality into the process, developed for the project.

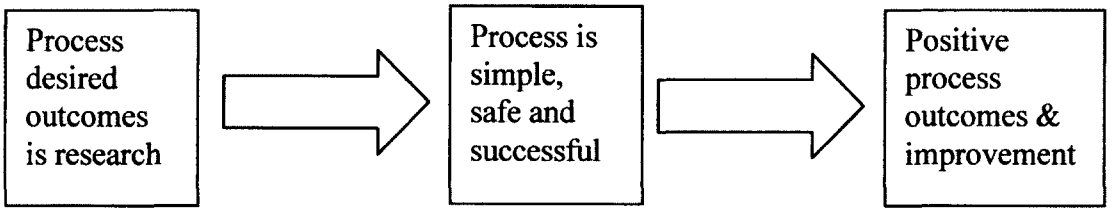



*Figure 4*. Quality is built into the process.

4. Minimize the use of suppliers to a single supplier for any one item (Deming, 1986, p. 31).

Medical supplies are used mostly by nurses and physicians. Suppliers must seek a nurse's feedback and expectations of the supplies. Working together closely can help build a strong relationship between the customer and their suppliers. Strong communication and relationships can create winning contracts and a better deal for both organizations. A Nurse's satisfaction with products can enhance the nursing service. Figure 5 describes the benefits of strong relationship with suppliers.

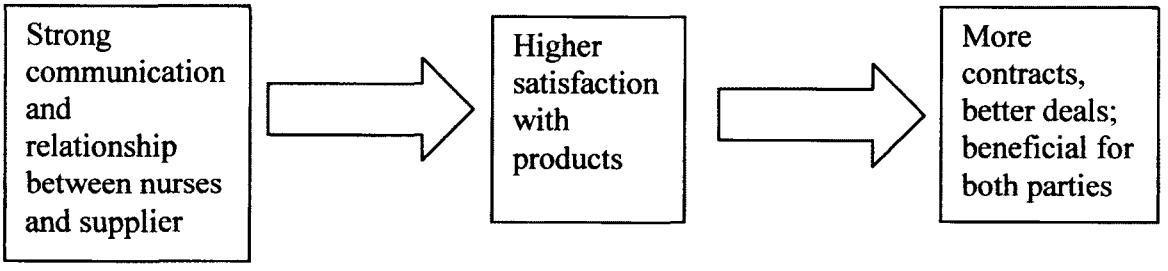



*Figure 5*. Building strong relationship with suppliers.

5. Improve continuously and forever (Deming, 1896, p. 37).

Since the early days of nursing, continuous improvement has been one of the major principles of the profession. Unfortunately, over a century later, nursing must still overcome challenges before reaching a full level or technique to master the skill of continual improvement. Nurses must be empowered to speed up improvement of the nursing process. The founder of the nursing profession, Florence Nightingale, spoke about continuous improvement during her speech to a graduation class (1872) of Saint Thomas, School of Nursing: "For us who nurse, our nursing is a thing which, unless we are making progress every year, every month, every week, take my word for it, we are going back..." (The Florence Nightingale Foundation, 2014). As mentioned before, the focus of this project was to improve a nursing process. For this project, the process of controlling blood glucose after cardiac surgery data was reviewed. From the data of poor outcomes results, a root cause analysis of the problem was found. Next, a new protocol was developed after a close study of the nurse's activities around this specific process and the effects of the medication insulin utilized per protocol to achieve the desired outcomes per the SCIP guidelines.

6. Implement training on the job. Use training tools to prepare employees to train each other (Deming, 1986, p. 47).

Different hospitals function by the same standards of care but the environment and culture of each hospital differs due to physical building, population group, and the specific services they provide. Nurses must be trained on the job to perform in a competent and comfortable level. Therefore, all cardiac

nurses were trained with the SCIP guidelines and the new protocol to achieve desired outcomes. Figure 6 explains the training cycle for new nurses to become experts after two years of practicing and becoming trainers to a new group of the nursing workforce.

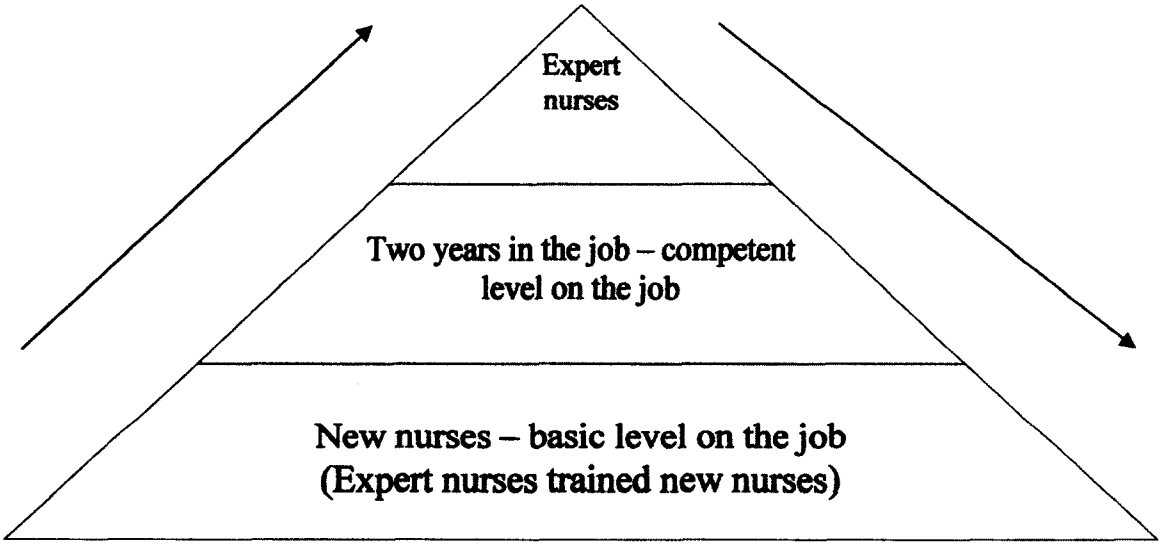



*Figure 6.* Nurses training nurses. The pyramid explains the cycle of expert nurses training new nurses to reinforce the nursing workforce.

7. Implement leadership (Deming, 1986, p. 54).

Nursing leaders have the responsibility to provide resources and empower the workforce to provide a high quality service. Without leadership, the workforce of over 3 million nurses cannot improve. Quality management principles can guide nursing leaders to overcome the challenges in healthcare today.

For this project, management was involved supporting the collaboration between nurses and physicians in developing a new protocol for blood glucose management. The manager of the coronary care unit facilitated the approval of the

new protocol by hospital committees. Figure 7 shows two of the leader's responsibilities within the nursing workforce to attain improvements in healthcare.

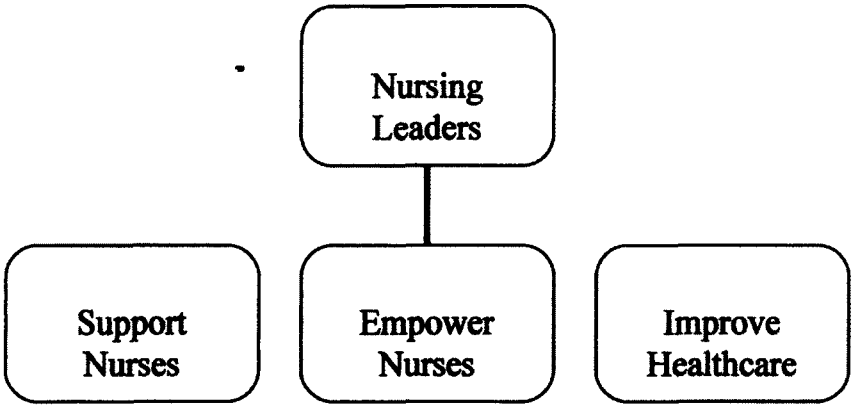



*Figure 7.* Nursing leadership.

8. Drive out fear (Deming, 1986, p. 58).

Nurses are the main operators of the nursing profession and are experts of the processes. Nurses should feel free to express ideas or concerns in order to develop a culture of innovators to improve the profession.

For this project, cardiothoracic surgeons requested and valued nurses input in the development of the blood glucose management protocol. The request was supported by management, and every nurse had the opportunity to give suggestions for the new protocol. In figure 8, the author identifies the results of working in an environment free of fear to express ideas from the experts of the process.

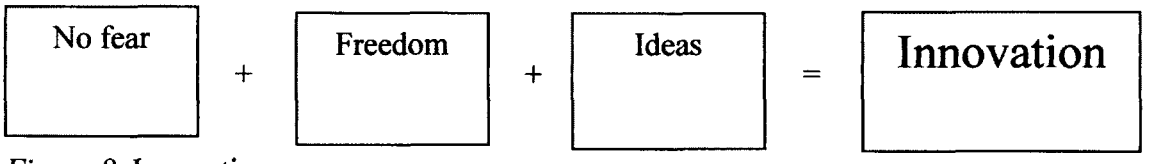



*Figure 8.* Innovation.

9. Break down barriers between departments (Deming, 1986, p. 62).

In the hospital setting, nurses have to deal with every other department. Nurses are the internal customers of other departments, and those departments are the nurses' customers throughout the hospital setting. The nursing department and other divisions depend on each other to do their job. Understanding each other's role in patient outcomes and how each role is interrelated to provide a high quality service can help break the barriers between hospital departments.

For this project, nurses from the coronary care unit, cardiac operating room, pharmacy, educators and the quality department discussed suggestions for the development and launching of the protocol. Figure 9 shows the flow of communication between the nursing department and other departments in the hospital. It was crucial that all employees understood the concept of no barriers between departments and improve communication and working relationships among all departments.

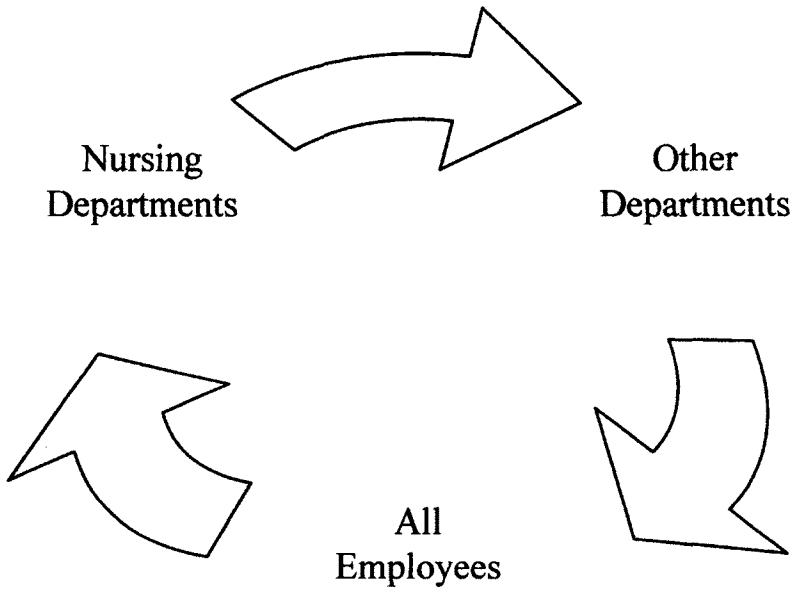



*Figure 9.* Breaking down barriers.

10. Eliminate the use of slogans and exhortations by asking for zero defects and unacceptable concepts of productivity (Deming, 1986, p. 65).

Be clear and realistic on what is expected and how to achieve it. Asking for zero defects increases pressure and may cause the purpose of quality and teamwork to be overlooked. When systems are built to include quality in every aspect of the system, then quality naturally falls into place. This avoids the need to ask for the unreachable when quality has been already compromised. Nurses are constantly under pressure to do a better job because reimbursement depends on the high quality nursing service, but until management improves the process, outcomes won't improve. For example, poor compliance with blood glucose management as expected by CMS guidelines affects reimbursement for cardiac surgery. Using quality tools to develop a new protocol resulted in better outcomes evidenced by

results discussed in Chapter 4. In Figure 10, the author described the simplicity of building quality into the process.

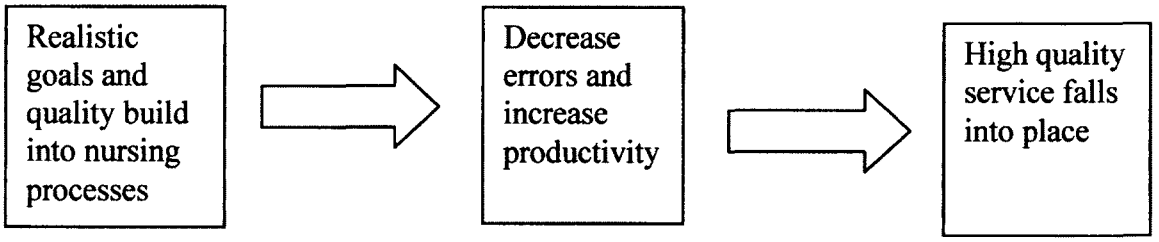



*Figure 10*. Build quality into the process.

11. Eliminate numerical targets (Deming, 1986, p. 70).

Eliminate working towards numerical goals and focus work towards improved quality. When the focus is on saving costs and not promoting quality, it can result in higher waste and less productivity. A system that embraces continual improvement results in higher productivity and lower costs. The system also needs to analyze and improve the process in order to increase productivity. Before managers predict increasing productivity, they must have a well-developed method to improve productivity without demanding that productivity reach a target.

For this project to achieve better blood glucose management results, it was concluded by the team of nurses and physicians the need to check blood glucose every hour for forty-eight hours. Decreasing the times of blood glucose testing would decrease daily costs, but it could result in poor outcomes, increasing the cost of cardiac surgery and hospital loses.

12. Allow pride of workmanship (Deming, 1986, p.78).

The nursing profession is special because people's lives are in their hands. Nurses are the main health professionals that take care of patients in the hospital setting. They must take pride in their profession. All nurses should achieve high levels of competency and provide the best care possible to their patients. Nurses in the coronary care unit are proud of their participation with the development of the new protocol especially because nurses are the main operators following the protocol orders.

13. Support education and self-improvement (Deming, 1986, p. 86).

The Institute of Medicine and the Robert Wood Foundation research have recognized nurses as the key factor in healthcare to increase quality of the service. One of the recommendations is for higher education by the 2020. At least 80% of nurses should hold a Baccalaureate degree in Nursing. Healthcare leaders embrace higher education for nurses. Employers supporting a nurse's education can increase the quality of the workforce while also increasing the quality of its service to the community. Nurses in the coronary care unit realize how important they are for improving patients' outcomes. Higher education gives nurses the tools to provide valuable participation, based on their education. Community Memorial hospital supports employees education advancement with schedule flexibility and reimbursement for classes costs. The bottom line is that higher educated employees are valuable for the organization.

14. Transformation is everyone's job (Deming, 1986, p. 90).

Transformation cannot be achieved without the participation of everyone in the organization. Everyone in the nursing department should be committed to the transformation for the welfare of the organization.

Introducing a new quality management system philosophy to healthcare providers was challenging. Nurses were explained that poor compliance with the new protocol increases variations of the process. Appendix D was developed to introduce health care providers to Deming's philosophy. This teaching tool was distributed in the coronary care unit. Nurses were introduced to Deming's 14 Points to understand the purpose of the project.

## Results

During the initial phase of the project, it was challenging to obtain the surgeons' support and trust with delegating such a simple, but important, process to the nurses. Management was pleased with the surgeons' trust in the project. The organization was delighted with the results from the new protocol. Outcomes improved from 86 % to 99 % and maintained above California and national average for two years. After two years of using the protocol designed by nurses, Centers of Medicare and Medicaid Services changed the guidelines for the blood glucose goals. Nurses redesigned the protocol to the new guidelines and again maintained above average outcomes.

## Summary

Getting nurses involved with the nursing process improvement was the best way to empower the nurses. Implementing quality philosophies and superior tools into the nursing profession is the right way to increase quality in healthcare. The quality movement in healthcare must reach the largest workforce in healthcare, which are nurses. Each year, healthcare has been affected by less reimbursement caused by not improving the quality of the nursing profession. Nurses are the key to providing the best possible service for all stakeholders.

# APPENDIX B

# POST-CARDIAC SURGERY:
# BLOOD GLUCOSE MANAGEMENT PROTOCOL

# POST- CARDIAC SURGERY:
# BLOOD GLUCOSE MANAGEMENT PROTOCOL

The blood glucose management protocol is a set of physician's orders that includes how often a blood glucose test should be done and how much medication is to be administered following a sliding scale. The sliding scale determines medication and medication doses to treat specific blood glucose levels. Post cardiac surgery blood glucose management protocol targets The SCIP guidelines recommended by CMS.

Regular insulin:
Regular insulin has an onset of action (begins to reduce blood sugar) within 30 minutes of injection, reaches a peak effect at 1-3 hours, and has effects that last 6-8 hours.

Action Plan
Day of Surgery 0

POD 1
Check blood glucose (BG) every hour until Day 1 – 0600 Then BG every two hours if off drip after POD 0600

0300 am - If BG > 150 < 200 continue drip
0300 am - If BG > 200 continue drip and give sliding scale bolus
0400 am – if BG >150 < 200 continue drip
0400 am - If BG > 200 continue drip and give sliding scale bolus
0500 am – if BG >150 < 200 continue drip. Recheck at 0530
0500 am - If BG > 200 continue drip and give sliding scale bolus. Recheck BG at 0530
0530 am – If BG >200 continue drip and give sliding scale bolus
0600 am – Draw lab chemistry

POD 2
0300 am - If BG > 150 < 200 continue drip
0300 am - If BG > 200 continue drip and give sliding scale bolus
0400 am – if BG >150 < 200 continue drip
0400 am - If BG > 200 continue drip and give sliding scale bolus
0500 am – if BG >150 < 200 continue drip. Recheck BG at 0530
0500 am - If BG > 200 continue drip and give sliding scale bolus. Recheck at 0530
0530 am – If BG > 200 continue drip and give sliding scale bolus
0600 am – Draw lab chemistry

*Note.* Appendix B shows the new protocol for post-cardiac surgery blood glucose management protocol following the SCIP glucose control guidelines required by CMS. The action plan protocol was developed by the nursing workforce and approved by the cardiac surgeons and hospital committees.

# APPENDIX C

# BLOOD GLUCOSE MANAGEMENT PROTOCOL IN COMPLIANCE WITH THE SCIP 2014 GUIDELINES

# BLOOD GLUCOSE MANAGEMENT PROTOCOL IN COMPLIANCE WITH THE SCIP 2014 GUIDELINES

This project followed blood glucose management from January 2012 to December 2013. CMS changed the SCIP guidelines starting January 2014. The new blood glucose management protocol was not part of the project but represent the new culture generated from applying Deming's 14 Points. Nurses and physicians form the coronary care unit developed a new protocol working together as main operators of this nursing intervention and following CMS new guidelines.

DIABETIC PROTOCOL 2014:

Yes No

Measure Finger stick Glucose:

Determine glucose finger stick every hour for 24 hours after Anesthesia End Time, then every 4 hours and PRN

Give Regular Human Insulin by IV bolus doses as indicated, using the following sliding scale:

Regular Bolus Dose Sliding Scale for blood glucose:

| | |
|---|---|
| 51-130 | No insulin - repeat glucoscan |
| 131-149 | Give 1 unit of regular human insulin |
| 150-170 | Give 3 units of regular human insulin |
| 171-220 | Give 5 units of regular human insulin |
| 221-270 | Give 7 units of regular human insulin |
| 271-320 | Give 9 units of regular human insulin |

Greater than 320 Give 10 units of regular human insulin

Insulin infusion (continue intermittent IV bolus sliding scale insulin PRN)

1) Measure baseline glucose. Start infusion if greater than 130. Continue blood glucose measurement every hour and PRN while on infusion

2) Determine initial regular insulin infusion rate:

| If Blood Glucose is (mg/dl): | Initial Infusion Rate (units per hour): |
|---|---|
| 130-149 | 1 |
| 150-170 | 2 |
| 171-220 | 4 |
| 221-270 | 5 |
| 271-320 | 6 |
| 321-370 | 8 |
| Greater than 370 | 10 |

After Starting Insulin Infusion, Check Blood Glucose Q1H by Sliding Scale, Adjust the Infusion Rate:

| If Blood Glucose is (mg/dl): | Infusion Rate Increase: |
|---|---|
| Less than 65 | Stop infusion and give 25 ml of D50W IVP, call Doctor for further orders |
| 65-109 | Stop infusion and recheck glucose hourly<br>If greater than 130, resume infusion |
| 130-149 | Continue same rate |
| 150-170 | Increase by 1 unit per hour |
| 171-220 | Increase by 2 units per hour |

| | |
|---|---|
| 221-270 | Increase by 4 units per hour |
| 271-320 | Increase by 6 units per hour |
| 321-370 | Increase by 8 units per hour |
| greater than 370 | Increase by 10 units per hour |

If blood glucose is between 110-129, decrease rate by 50% of current rate. Recheck in 30 minutes.

Action Plan
Glycemic control post cardiac surgery
Goal: Blood glucose 130-170 mg/dl in the timeframe of 24 hours after Anesthesia End Time

Anesthesia End Time:.....

Check blood glucose (BG) every hour for 24 hours after the Anesthesia End Time
Timeframe 18-24 hours after Anesthesia End Time (Strict Control)
If BG > 130 continue drip (following Insulin Infusion Sliding Scale) and give sliding scale bolus

*Note.* The new blood glucose protocol was re-designed by the nursing workforce and physicians to meet the new CMS guidelines in 2014. This protocol development related to the project in that the Deming's 14 Points philosophy applied to the nursing workforce in 2012 guided the process for nurses' involvement with changes in healthcare.

# APPENDIX D

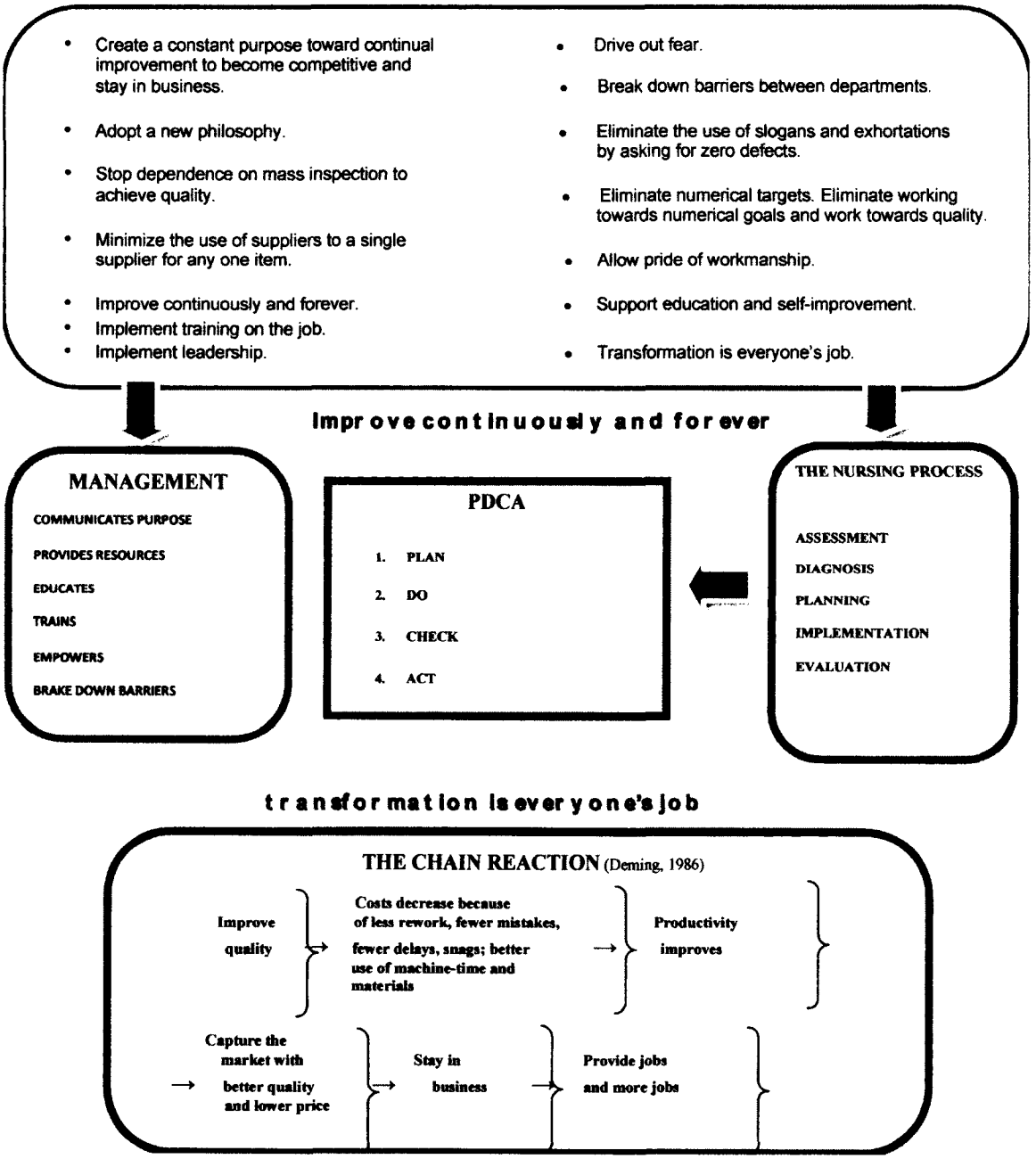
# DEMING'S 14 POINTS

Appendix D is a teaching tool utilized for this project.

The teaching tool was an introduction of Deming's philosophy to the nursing workforce, also including management and front-line staff. Quality management philosophies were not well known by the nursing workforce and created some resistance to the new philosophy and change. Appendix D related Deming's philosophy to the nursing profession. Also, Deming's Chain Reaction helped to explain how focusing in improving quality in healthcare could be a potential solution to healthcare crisis of high expenditures. Improving quality and patients' outcomes can decrease healthcare costs.

The PDCA method is mentioned as the appropriate teaching tool because many hospitals use the PDCA methodology for continual improvement. The author of the project believes that a quality management philosophy such as Deming's 14 Points can achieve better results in improving quality of the healthcare service.

# Deming's 14 Points (Deming, 1986)



# APPENDIX E

# LETTER OF PERMISSION

Appendix E provides a letter of permission.

Appendix E is a letter by Community Memorial Hospital in Ventura, granting permission to use the facility (with its name) as the focus of this graduate project. The project entitled, *"The Missing Concept to Improve the Nursing Process: A Quality Management System."* The emphasis was on Deming's teachings and the nursing process (blood glucose management) of the post-operative care for cardiac surgical patients.

**Community Memorial Health System**

*Where Excellence Begins with Caring*

Gary K. Wilde
President & CEO

March 27, 2015

To: California State University
Dominguez Hills

Gentlemen:

This letter will serve as permission for Pilar Parker to use the name of this hospital – Community Memorial Hospital, which is part of the Community Memorial Health System, in her graduate study project entitled, *"The Missing Concept to Improve the Nursing Process: A Quality Management System."*

If you have any questions please do not hesitate to contact me.

Sincerely,

Gary K. Wilde, DHA, FACHE
President and CEO

GKW:rp

147 N. Brent St., Ventura, CA 93003 • 805/652-5001 • 805/648-9312 FAX