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Healthcare Quality Excellence: A Comparison of Malcolm Baldrige and Magnet Designation Recipients

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HEALTHCARE QUALITY EXCELLENCE: A COMPARISON OF MALCOLM BALDRIGE AND MAGNET DESIGNATION RECIPIENTS

BY

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Committee: Jerry Mansfield PhD, RN & Carolyn Sanders PhD, RN

Hospitals today face pressures from a variety of stakeholders to improve performance and quality across a growing number of comparative process and outcome measures which has become the basis for value based purchasing and reimbursement. This study investigates and compares the relationships between the effective application of the Malcolm Baldrige Health Care criteria for performance excellence and Magnet Designation for excellent quality in nursing care and outcomes from the Hospital Compare datasets. Both of these designations require a large commitment of financial and personal resources, and time. This study compares the hospital outcome scores of thirty-three health systems who have achieved either the Malcolm Baldrige or Magnet Designation Since the year 2009. Many categories of performance were explored including (1) process of care (2) patient experience and (3) outcome of care. Recipients of the Magnet award for nursing excellence scored higher in the areas of process of care and outcomes of care. Malcolm Baldrige recipients provided care equal to or better than those with Magnet designations while providing better patient experiences.

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Background and Need:

In 1999, the Institute of Medicine (IOM) published the infamous report titled *To Err is Human: Building a Safer Health System.* This report, sobering to healthcare systems Nationwide, showed that healthcare in the United States was not as safe as it should, or could be. Even when using lower estimates, preventable medical errors in hospitals exceed attributable deaths to such feared threats as motor vehicle accidents, breast cancer and AIDS. According to the report, at least 44,000 people and potentially as many as 98,000 people, die in hospitals each year as a result of medical errors that could have been prevented (Kohn, Corrigan & Donaldson, 1999). This was a wakeup call to hospitals, clinicians and administrators. One of the report's main conclusions was that the majority of medical errors do not result from individual recklessness or the actions of a particular group or individual. More commonly, errors are caused by faulty systems, processes and conditions that lead people to make mistakes or fail to prevent them. Instead, mistakes can best be prevented by designing the health system at all levels to make it safer and harder for people to do something wrong and easier for them to do something right. Of course, this does not mean that individuals can be careless. People still must be vigilant and held responsible for their actions (Kohn, Corrigan & Donaldson, 1999). The U.S. healthcare delivery system does not provide consistent, high quality medical care to all people.

"Americans should be able to count on receiving care that meets their needs and is based on the best scientific knowledge, yet there is strong evidence that this frequently is not the case. Healthcare harms patients too frequently and routinely fails to deliver its potential benefits. Indeed, between the healthcare that we now have and the healthcare that we could have lies not just a gap, but a chasm" (IOM, 1999 pg 1).

These opening sentences to the Institute of Medicines 2001 follow up article entitled *Crossing the Quality Chasm: A New Health System for the 21st Century*, describes interrelated factors that constitute high-quality care and can improve the healthcare system. This report influenced the Centers for Medicare and Medicaid Services (CMS) to link a portion of hospital payment to quality measures and patients' perception of care as part of Value Based Purchasing (VBP). The Affordable Care Act (ACA) created the Centers for Medicare and Medicaid Services value-based purchasing program and transitioned Medicare toward integration and alignment among payment and quality outcomes. The VBP was designed to reward hospitals for improving the quality of care by redistributing Medicare payments to higher-performing hospitals in terms of quality measures receive a greater portion of payment than do lower-performing hospitals (Centers for Medicare and Medicaid, 2012). Initially VBP was to include three dimensions of quality: (1) process of care (2) patient experience and (3) outcomes of care; it would eventually expand to include (4) efficiency and (5) safety outcomes. These strategies are designed to specifically reward hospitals financially for providing higher quality care, to bring about transformational changes in total care delivery, and to increase the level of shared accountability among providers (Miltenberger, Downs, & Greene, 2012). With quality being at the forefront of healthcare, hospitals focus and strive to implement processes that can increase their chances of success when it comes to the dimensions described in VBP. There are two prestigious awards that can be obtained through a rigorous application process that once obtained indicate that quality is being delivered at the absolute highest level.

Magnet Designation:

The Magnet Recognition Program recognizes healthcare organizations for quality patient care, nursing excellence and innovations in professional nursing practice. Consumers rely on

Magnet designation as the ultimate credential for high quality nursing. Developed by the American Nurses Credentialing Center (ANCC), Magnet is considered by many to be the leading source of successful nursing practices and strategies worldwide (ANCC, 2016). Magnet hospitals report higher percentages of satisfied Registered Nurses (RN), lower RN turnover and vacancy, improved clinical outcomes and improved patient satisfaction (ANCC, 2016).

Originally conceived in 1983, the fourteen forces of magnetism established, the essential elements or building blocks of excellence in nursing and the provision of high quality care. The Magnet program grew out of 41 hospitals selected as "Magnets" by the American Academy of Nursing during the nursing shortage in the 1980s. The fourteen forces are the characteristics that form the basis for how Magnet recognition is determined. When a Magnet environment is fully developed, the Forces of Magnetism are disseminated and become part of the culture wherever nurses practice, positively influencing all aspects of the organization (Morgan, 2007).

Although a prestigious accomplishment, Magnet is not a common achievement. As of 2015 approximately only 7% of all registered hospitals in the United States have achieved Magnet Recognition status (ANCC, 2016). Magnet status is not a prize or an award. Instead, it is a credential of organizational recognition of nursing excellence.

Malcolm Baldrige National Quality Award:

An award established by the United States Congress in 1987 to raise awareness of quality management and recognize U.S. companies that have implemented successful quality management systems. Awards are presented annually by the President of the United States to organizations that demonstrate quality and performance excellence in one of six categories: manufacturing, service, small business, education, healthcare and nonprofit.

Organizations that apply for the Baldrige Award are judged by an independent board of examiners. Recipients are selected based on achievement and improvement in seven areas known as the Baldrige Criteria for Performance Excellence:

1. Leadership: how upper management leads the organization, and how the organization leads within the community.

2. Strategic planning: how the organization establishes and plans to implement strategic directions.

3. Customer and market focus: how the organization builds and maintains strong, lasting relationships with customers.

4. Measurement, analysis, and knowledge management: how the organization uses data to support key processes and manage performance.

5. Human resource focus: how the organization empowers and involves its workforce.

6. Process management: how the organization designs, manages and improves key processes.

7. Business/organizational performance results: how the organization performs in terms of customer satisfaction, finances, human resources, supplier and partner performance, operations, governance and social responsibility, and how the organization compares to its competitors (ASQ, 2016).

Problem Statement:

Hospitals and health systems are under increasing pressures from a variety of stakeholders to improve performance and quality across a growing number of comparative process and outcomes measures which has become the basis for value based purchasing and reimbursement. Hospitals may choose to focus on:

1) The Malcolm Baldrige Award for Quality; and/or

2) Magnet designation for nursing excellence

There is evidence to support that each award is related to improved hospital quality. However, earning either award is an intensive process and is unclear if one may have greater impact on hospital quality outcomes than the other?

HYPOTHESIS 1: Hospitals with the Malcolm Baldrige Quality Award will have lower hospital mortality rates than Magnet designated hospitals.

Rationale: Since the pillars of Malcolm Baldrige apply to all entities that work in a hospital setting, there are many variables in a patient's hospital stay that can lead to mortality outcomes beyond nursing. Malcolm Baldrige, criteria have a higher potential of including but not limited to just the nursing.

HYPOTHESIS 2: Magnet designated hospitals will have higher scores on Patient Experience measures than those who have received Baldridge designation.

Rationale: When patients think about their overall hospital experience they often think of nursing. Magnet designation is an excellent recognition that primarily focuses on nursing excellence. If a hospital has put forth the time and effort to make nursing excellence a top priority it may reflect in patient responses and will exceed the patient experience scores compared to those who have achieved Malcolm Baldrige.

Study Design:

The design study is a retrospective analysis of archival data. This design will allow analysis of previously collected and stored comparative data.

Population: Hospital Malcolm Baldrige recipients and comparable/like hospitals who have

obtained or received Magnet Designation. Hospital data sets will be compared, inclusive of calendar years 2009 – 2015. While 2002 was the inaugural year for Malcolm Baldrige award the patient experience measures began public reporting in 2009.

Data Sources: The data source is Hospital Consumer outcomes, which includes the Hospital Assessment of Healthcare Providers and Systems (HCAHPS) and patient mortality outcomes. This is a national, publicly available database, this study will examine outcomes from 2009-2015.

Variables Measured: The variables measured are the HCAHP measures of (1) Overall Rating of Hospital (2) Willingness to recommend and lastly (3) Hospital Mortality Rates.

Statistical Analysis: Descriptive statistics will be used to describe comparison of means for continuous variables, using a t-test or non-parametric test and include a chi-square test for comparing categorical variables.

Data Collection:

All data sets for this research project are publicly available via the Hospital Compare website. The Malcolm Baldrige and ANCC websites provide a list of the recipient hospitals. CMS publishes data sets discussing geographic locations and hospitals sizes which are used to find appropriate compare groups.

Factors Affecting Findings:

There are several factors that can have an effect on the study findings. Escalating healthcare costs are straining federal and state budgets hindering the nation's ability to pay for important initiatives needed to address other non-healthcare issues. Every health system needs to make a choice on what investment to make. Hospitals that may have been awarded Magnet or Baldrige may no longer be on those designation journeys. Since 2004, healthcare has undergone

significant change, all of these factors could have an unknown impact that may skew or effect outcomes of care.

Expected Findings:

It is expected that hospitals that make it a priority to go on a Baldrige or Magnet journey will have elevated patient quality scores and mortality rates. Finally, it is expected that hospitals who choose to do both will be ahead of the majority of other healthcare organizations.

REVIEW OF LITERATURE:

A retrospective literature review was conducted to identify empirical evidence of quality improvements on two of the more popular healthcare quality awards and to identify any gaps that may still currently exist in the field. The Magnet designation for nursing excellence and the Malcolm Baldrige National Quality Award are two of the most recognizable prestigious awards/designations. High performing health systems endeavor to pursue these and even increase in the top-quality deciles. The literature revealed a variety of articles and case studies published regarding hospital quality scores and initiatives from the early 1990's to September 2016.

Methods

Published research between 1990-2016 was gathered using electronic databases PUBMED, CINAHL and MEDLINE as well as the American Nurses Credentialing Center (ANCC) and Malcolm Baldrige websites. The search terms used were: Magnet status, Malcolm Baldrige National Quality Award, hospital, healthcare, patient outcomes, quality and nursing. All articles relating specifically to healthcare quality from the inception of the two awards were identified and reviewed. All non-professional publications were excluded.

Magnet Designation

Impact of Magnet Status on Patient Outcomes

Avera McKennan Hospital in Sioux Falls, South Dakota is a four-time Magnet designee. The study reports that the hospital stays abreast of changes in Magnet standards and works to ensure they are constantly meeting and exceeding the newest industry standards. Sustaining a Magnet culture is reported to be their annual nursing strategic goal. As a result of their Magnet journey, the hospital has a large focus on best practice and specifically evidence based practice (EBP). Every nursing unit must complete and present a minimum of one Evidence Based Practice project at the hospital's semi-annual Nursing Research Day. In 2011, the hospital joined a national initiative to eliminate Central Line Associated Blood Stream Infection (CLABSI) among transplant oncology and patients in the intensive care unit (ICU). Nurses helped create, pilot, revise and implement staff education and process changes. In the first year, CLABSI rates decreased 93% in the ICU and 25% in oncology transplant. Overall, hospital-wide CLABSI rates decreased 25% (American Nurses Credentialing Center, 2016).

A study funded by the National Institute of Nursing Research and conducted by the University of Pennsylvania focused on Magnet hospital's data sets involving data from 1,205 consecutively admitted patients with AIDS and from 820 nurses on 40 units in a subset of 20 Magnet hospitals. Patient outcomes were compared for patients with AIDS in Magnet hospitals without dedicated AIDS units and in comparison, hospitals with and without dedicated AIDS units. Patients with AIDS in scattered-bed units in Magnet hospitals had lower odds of dying than did AIDS patients in any other setting by 60%, for example, than patients in non-Magnet hospitals. Other analyses associated with this study showed Magnet hospitals had significantly higher levels of patient satisfaction. While Magnet hospitals were found to have higher nurse to

patient ratios than other hospitals, the cost of more nurses was more than offset by significantly shorter lengths of stay and lower utilization of ICU days. Overall, multiple studies point to significantly better outcomes in Magnet hospitals, as compared with non-Magnet hospitals (Aiken, Havens & Sloane, 2000).

One in every four very low birth weight (VLBW) infants die within the first year of life; nearly all deaths (87%) occur in the first month. Infant mortality in the United States is concentrated in population. A team of researchers in Silver Springs, Maryland conducted a study and found a significantly lower risk-adjusted rate of seven-day mortality and two major morbidities – nosocomial infection and severe intraventricular hemorrhage (SIVH) among low birth weight infants born in the hospital with Magnet status (Lake et al., 2012). The objective of this study was to examine the relationships between hospital recognition for nursing excellence and very low birth weight infants. The cohort study involved 72,235 infants born in Magnet designated hospitals within Vermont Oxford Health Network's neonatal intensive care units from January 1st, 2007 and December 31st, 2008, these infants were then compared to national benchmarks of non-Magnet designated hospitals. The investigation concluded that hospitals with Magnet status were found to be associated with significantly lower rates of 7-day mortality, nosocomial infections and SIVH in VLBW infants. Rates of 7-day mortality (7%), SIVH (8%), and nosocomial infection (18%) were high in these patients. There was a 12% to 14% difference in the odds of these outcomes between Magnet designated hospital and non-Magnet designated with 95% confidence limits close to 1, which translates to relatively small adjusted absolute risk differences of 0.9% to 2.1% (Lake et al., 2012). The authors suggested one way to increase the number of infants that receive high-quality care would be to increase the number of hospitals with recognition of nursing excellence like the Magnet designation. The results of this study

suggest benefits for the VLBW population, but other hospitalized patients may also benefit as suggested by the empirical evidence (Lake et al., 2012).

A 2015 study examined the impact of Magnet status on nursing-sensitive patient outcomes. Data was analyzed on 108 Magnet hospitals and compared to 528 non-Magnet hospitals to measure patient falls and found that Magnet status was less significantly associated with fall rates. Magnet hospitals had 8.3% lower fall rates compared to non-Magnet hospitals. This same study also examined Hospital Acquired Pressure Ulcer (HAPU) rates for 326 Magnet hospitals and 838 non-Magnet hospitals and found that the odds of acquiring a HAPU were 32% lower for at-risk patients in Magnet hospitals (Petit dit Dariel & Regnaux, 2015) compared to non-Magnet hospitals.

A literature review involving ten studies of quality improvement at Magnet hospitals, yielded mixed results. The research team concluded that based on the mixed results and poor quality in the research designs, it was not possible to conclude that Magnet accreditation has effects on nurse and patient outcomes. There is a need for more robust designs that can confidently measure the key impact of such hospital accreditation on objective outcomes (Petit dit Dariel & Regnaux, 2015).

Impact of Magnet Status on Patient Mortality

In 1994, *Medical Care* published the first paper on patient outcomes in Magnet hospitals, documenting various topics that benefited from having Magnet nurses leading the way. A more recent study took the 1994 data a step further by determining whether the likelihood of mortality could be determined for formally designated Magnet hospitals. The researchers' inquiry dove into the possible explanations for such an advantage should one exist because there is now

substantial scientific based documentation associating a link between nurses and patient outcomes (McHugh et al., 2013). The study analyzed data on adult, general Magnet and non-Magnet hospitals from four states; California, Florida, Pennsylvania and New Jersey, between 2006-2007. The sample included 56 Magnet hospitals and 508 non-Magnet acute hospitals in the four states. Despite this study being conducted nearly twenty years after the initial 1994 study, the results were very similar in their findings. The new study concluded that Magnet hospitals had significantly better work environments than non-Magnet hospitals. They also had a significantly higher proportion of Bachelor educated nurses and specialty-certified nurses (McHugh et al., 2013). Of the surgical patients in the Magnet hospitals, 1.5% died within 30 days compared to 1.8% in non-Magnet hospitals. In Magnet hospitals, 3.8% of surgical patients with complications died (failure to rescue) compared to 4.6% in non-Magnet hospitals (McHugh et al., 2013). Overall, surgical patients in Magnet hospitals had 14% lower odds of inpatient death within 30 days, 12% lower odds of failure to rescue compared to non-Magnet hospitals (McHugh et al., 2013).

The University of Pennsylvania conducted similar research by performing a retrospective study to validate excitement surrounding the relatively new Magnet Designation process. The study examined Medicare mortality rates using data from 39 of the 41 original Magnet hospitals by using a multivariate matched sampling procedure that controlled for hospital characteristics that previous research had shown to be associated with mortality. The 39 Magnet hospitals were matched with 195 comparison hospitals selected from all non-Magnet U.S. hospitals. Medicare mortality rates in Magnet and comparison hospitals were compared using variance component models which pool information from each group of five matched hospitals and adjust for differences in patient composition, as measured by predicted mortality. After adjustment for

differences in predicted mortality for Medicare patients, the Magnet hospitals had 4.6% lower mortality for Medicare patients, the Magnet hospitals had a 4.6% lower mortality rate which accounts for between 0.9 to 9.4% few deaths per 1,000 discharges with 95% confidence (Aiken, Havens & Sloane, 2000).

Another study used a sample of 56 Magnet hospitals and compared them to 508 non-Magnet hospitals examining the correlation between the two and their 30-day patient mortality rates. The finding concluded that Magnet hospitals had 14% lower odds of inpatient death (Petit dit Dariel & Regnaux, 2015) than non-Magnet compare group.

Impact of Magnet Status on Patient Satisfaction / Safety

Pursuit of Magnet standards is reported to spark important quality initiatives including medication safety improvements and a reduction in central-line associated bloodstream infections (CLABSI). A multi-disciplinary team that included nurses from all levels developed structures and processes to improve the accuracy of patient identification, enhance caregiver communication, and improve the safety of medication administration. The hospital now maintains a better than 90% scan rate at the point of medication administration (American Nurses Credentialing Center, 2016). In addition, the hospital claims the severity of medication errors has declined at a statistically significant rate.

Impact of Magnet Status on Work Environment

In a health system's pursuit of Magnet designation, another reported effect is the impact this has on the workforce and work environment. Magnet facilities consistently demonstrate three key characteristics: (1) professional autonomy throughout nursing practice (2) nursing control over the practice environment and (3) effective communication among nurses,

physicians, and administrators. Magnet hospitals yield positive outcomes for patients and staff. These environments increase nurses' satisfaction, skill mix, and productivity. They demonstrate improved nursing recruitment and retention and decreased levels of burnout and workplace injuries. Patients experience lower disease-specific mortality rates, shorter lengths of stay, and greater overall satisfaction (Goryunova & Weinstein, 2003). In addition, ninety percent of the nursing staff at Magnet hospitals attend at least one continuing education program each year, and 100 percent of the chief nurse executives at Magnet organizations hold at least one graduate or higher degree. Fifty-two percent of nurses who serve in leadership positions at Magnet organizations have at least one graduate degree. One third of those nurses are considered advanced practice registered nurses, 48 percent had at least one board certification from a national certifying body (Monarch, 2001). Table 1 examines results from the Magnet literature review.

Table 1: Magnet Hospital Outcomes Research

Author	**Year**	**Research Method**	**Outcome**	**Result**
ANCC	2016	Retrospective	CLABSI	93% decrease (ICU)
ANCC	2016	Retrospective	CLABSI	25% decrease (oncology)
Aiken, Linda	2000	Cohort Study	Death in AIDS patients	60% decrease
Lake, Eileen et al.	2012	Cohort Study	Very low birth weight	7% less likely
Lake, Eileen et al.	2012	Cohort Study	Severe intraventricular hemorrhage	8% less likely
Petit dit Dariel, Odessa & Regnaux, Jean-Philippe	2002	Cohort Study	Hospital acquired infection	18% less likely
McHugh, Matthew et al.	2014	Retrospective	Mortality	14% less likely

Malcolm Baldrige National Quality Award

In today's environment, with heightened uncertainty about the future of healthcare in federal and state governments, health systems have to be extremely agile. They must adapt as quickly as the changes are coming forth while maintaining high quality and standards. Quality has many faces, from process improvement methods such as Lean or Six Sigma to comprehensive methods including the Malcolm Baldrige National Quality Award. Regardless of which method is chosen, one principle remains evident: enhancing quality across work streams, promoting quality with suppliers and partners and amplifying service quality to customers or patients is simply the backbone creating and sustaining a high-quality organization. The Malcolm Baldrige performance excellence criteria focuses on its "seven pillars."

Malcolm Baldrige Seven Pillars of Excellence

1. **Leadership:** examines how senior executives guide the organization and how the organization addresses its responsibilities to the public and practices good citizenship.
2. **Strategic Planning:** examines how the organization sets strategic directions and how it determines key action plans.
3. **Customer and Market Focus:** examines how the organization determines requirements and expectations of customer and markets; builds relationships with customers; acquires, satisfies and retain customers.
4. **Measurement, analysis and knowledge management:** Examines the management, effective use, analysis and improvement of data and information to support key organization process and the organization's performance management system.

5. **Work Force Focus:** Examines how the organization enables its work force to develop its full potential and how the workforce is aligned with the organization's objectives.
6. **Process Management:** Examines aspects of how key production/delivery and support processes are designed, managed and improved.
7. **Results:** Examines the organization's performance and improvement in its key business areas: customer satisfaction, financial and marketplace performance, human resources, supplier and partner performance, operational performance and governance and social responsibility. The category also examines how the organization performs relative to competitors (Burge, 2009).

Once an organization's leaders believe they have met the criteria described in the pillars of excellence they may submit for award consideration. At the time, the rigorous application process begins. There are four stages to the Baldrige application process which includes a site visit by a group of specifically trained examiners. Health systems are then evaluated on an absolute scale, so if a particular year no hospital meets the required standards, no award is given. The announcement of award winners is made during October and November, followed by a ceremony held near the end of the year and attended by the US President or Vice President (Przasnyski & Tai, 1999). Since its creation, the Malcolm Baldrige award has had a significant influence on many US organizations, particularly for companies embarking on or continuing with quality improvement efforts. The awards core values and concepts and extensive scoring guidelines and weightings are updated and revised annually to reflect current trends and thinking (Przasnyski & Tai, 1999). Many healthcare organizations utilize the Malcolm Baldrige concepts to focus specific barriers that they are faced with. These barriers could be affecting them in a

multitude of ways whether it be their patients directly, employee safety or even the operating margin.

Impact of Malcolm Baldrige on Patient Safety & Quality:

North Mississippi Medical Center (NMMC) is a 650-bed regional nonprofit healthcare system serving 22 counties and approximately 600,000 people. NMMC received the Malcolm Baldrige National Quality Award in 2006. During award pursuit, they utilized the Baldrige framework to solve existing problems within their health system. As an example, an issue involving insulin protocols presented as a barrier and patient safety concern. NMMC's insulin performance improvement team recognized a patient safety issue with the use of three sliding scale insulin protocols within the organization that did not adequately meet the evidence based standard of care for diabetes. Of the three insulin sliding-scales, each were flawed in unique ways, but more importantly, patient glucose levels were not maintained within appropriate ranges. Confusion among prescribers and nurses put patients at risk for adverse drug reactions. The insulin team guided a pharmacy resident in performing a retrospective observational study comparing a newly developed order set with the existing three insulin scales (Foster & Pitts, 2009).

Fort Collins, Colorado-based Poudre Valley Health System, was named a Malcolm Baldrige recipient in 2008, claiming the use of Baldrige criteria was the secret to success. By implementing the criteria, they created an informed and engaged workforce that used a Plan-Do-Check-Act improvement cycle (Thompson, 2009). As an example, the improvement enhanced performance improvements and solved problems with at the bedside scanning bar codes on IV admixtures. The team of pharmacists, technicians and nursing staff tackled the problems. The team decided that the pharmacy department would change its batch preparation of admixtures.

Since that change, the overall scan rates for bar-coded medication doses have exceeded 90% for six months. An added bonus has been the reduction in pharmacy waste rate (Thompson, 2009). Once these improvements began showing favored results, the pharmacy team once again used the Baldrige criteria and expanded their use of information technology. Instead of the previous single pharmacy location, they now support pharmacy services at five independent rural hospitals and have replicated their results (Thompson, 2009).

In 2007, Mercy Health System in Janesville, Wisconsin and Sharp Healthcare, San Diego were both awarded the Malcolm Baldrige award. Both were recognized for having exemplar clinical excellence that met or beat national benchmarks; Mercy by decreasing mortality rate for community acquired pneumonia, and Sharp for its low heart attack mortality rate in its intensive care units (Thrall, 2008) respectively.

Saint Luke's hospital, a 623-bed community teaching hospital that received Malcolm Baldrige in 2003, has a long history of distinguishing itself through quality initiatives. Saint Luke's pharmacy department instituted a number of improvements that were that were included in their Baldrige application showcasing their quality improvements. These improvements included pneumococcal vaccination rates, time to first dose antibiotics, Pyxis stock out rate, percentage of patients receiving anticoagulation education, timing of antibiotics prophylaxis, and medication variance per 1,000 doses (DeJong, 2009).

In the literature review, eleven studies examined the relationship of hospital quality and the correlation to either the Magnet designation or the Malcolm Baldrige award. All applied the Magnet or Baldrige criteria to their specific area of need all with positive results. Both awards are a lengthy process and come with a financial cost making it a challenge for health systems to pursue both. It may come down to a decision of one or the other, in that case, which one is

better? During the literature review no studies were identified that compare the outcomes of Magnet and Malcolm Baldrige, only that they both can result in positive quality outcomes.

METHODOLOGY:

Research Design and Method:

The study is a retrospective analysis of archival data sets. The data sets are from nationally reported data submitted by hospitals / health systems comparing recipients of Malcolm Baldrige National Quality award and/or Magnet Designation for nursing excellence.

Operational Definitions/Variables Measured:

This study compares the quality scores in the following outcomes: Overall Rating of Hospital, Willingness to recommend and Hospital Mortality Rates. Table II describes each outcome variable and its operational definition.

Table II: Selected HCAHP Questions That Focus on Quality and Outcomes

Measure	Definition	Outcome Format	Rationale	Years Available
Overall Hospital Rating:	Using any number from 0 to 10, where 0 is the worst hospital possible and 10 is the best hospital possible, what number would you use to rate this hospital during your stay?	linear mean score	A hospital's overall rating is a cumulative score of all ranked categories that give an indication of the expected overall patient experience and quality.	2008-2015
Willingness to Recommend:	Would you recommend this hospital to your friends and family (1) Yes	linear mean score	A hospital's willingness to recommend score indicates patients'	2008-2015

	definitely (2) probably (3) definitely not.		response / perceptions of their hospital visit. This score indicates if they are likely to return or recommend to family and friends in the future.	

Patient Outcomes: Mortality Rate (Congestive Heart Failure)

Table II continued

Heart Failure Mortality Rate:	The number of patient deaths (mortality) in a hospital is shown as a mortality ratio that compares patients' actual mortality rates to their expected rate of mortality.	Percent: likelihood of mortality	Hospitals track and report their mortality rate scores across the nation. This is an indicator of the care, technology and standards of a hospital and an indicator of a patient's likelihood of death during an inpatient visit.	2007-2015

Sample Selection

The Malcolm Baldrige recipients have been identified through the Malcolm Baldrige website (Table III). The Magnet recipients were identified through the American Nurses Credentialing Center website (ANCC). Malcolm Baldrige Quality Award Winners are compared with two similar or like hospitals by geographical region and size that have received the Magnet Award for Nursing Excellence based on and categorized by the following: major academic medical centers, teaching hospitals (200 or more acute-care beds), large community hospitals

(250 or more acute-care beds), medium-size community hospitals (100-249 acute-care beds) or small community hospitals (25-99 acute-care beds).

Data Source:

The primary data source for the study was the Hospital Compare Dataset. This source includes hospital-level outcomes from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), Centers for Medicare and Medicaid (CMS) data, and general hospital information (e.g. bed size, hospital type). The HCAHPS Survey is administered continuously throughout the year to a random sample of adult patients across medical conditions between 48 hours and 6 weeks after discharge. Once received, CMS synthesizes, adjusts and analyzes the data, then publicly reports the results. The results can be downloaded by the public at https://data.medicare.gov/data/hospital-compare.

Table III: Malcolm Baldrige Recipients 2002 – 2015

Institution	Location	Year	Classification
Charleston Area Medical Center Health System	Charleston, WV	2015	Health System
Hill County Memorial	Fredericksburg, TX	2014	Small Community
St. David's Medical Center	Austin, TX	2014	Teaching Hospital
Sutter Davis Hospital	Davis, CA	2013	Small Community
North Mississippi Health Services	Tupelo, MS	2012	Health System
Henry Ford Health System	Detroit, MI	2011	Health System
Schneck Medical Center	Seymour, In	2011	Small Community
Advocate Good Samaritan Hospital	Downers Grove, Il	2010	Large Community Hospital
AtlantiCare	Egg Harbor, NJ	2009	Teaching Hospital

Mosaic (formerly Heartland Health)	Saint Joseph, MO	2009	Large Community Hospital
Poudre Valley Health System	Fort Collins, CO	2008	Medium Community Hospital
Mercy Health System	Janesville, WI	2007	Health System
Sharp HealthCare	San Diego, CA	2007	Health System
North Mississippi Medical Center	Tupelo, MS	2006	Large Community
Bronson Methodist Hospital	Kalamazoo, MI	2005	Large Community Hospital
Robert Wood Johnson University Hospital Hamilton	Hamilton, NJ	2004	Medium Community Hospital
Baptist Hospital, Inc.	Pensacola, FL	2003	Large Community Hospital
Saint Luke's Health System	Kansas City, MO	2003	Teaching Hospital
SSM Health Care	Saint Louis, MO	2002	Health System

Statistical Analysis:

This study used descriptive measures to compare specific quality measures of Malcolm Baldrige hospitals to similarly sized Magnet hospitals of the award designated year. Tables are provided to illustrate variations through the years as well as calculating out means and percentages for each outcomes variable. Finally, t-tests were conducted to compare the average outcome scores between hospitals that earned Baldrige and Magnet status.

RESULTS

This study examined hospital outcomes for Malcolm Baldrige Hospital Quality award recipients and their comparison Magnet Designated hospitals from 2009 to 2015. The comparison groups are grouped together by geographic location to minimalize regional

differences in education, insurance status and socioeconomic class. Two hospitals, excluded from the data are 2008 Malcolm Baldrige recipient Poudre Valley hospital and 2011 Malcolm Baldrige recipient Schneck Hospital because during the years they were both Baldrige and Magnet recipients. Table IV describes these hospital characteristics and demographics in the categories of (1) Baldrige Hospitals (2) Magnet compare hospitals (3) city location (4) median household incomes (5) percent of citizens >25 years of age with a Baccalaureate degree (6) number of citizens <65 years old who do not have health insurance. When comparing these hospitals to the national averages 56% of Malcolm Baldrige and 66% of Magnet hospitals fall below the national average household income of $53,889. The demographics of Malcom Baldrige recipients and their comparison Magnet hospitals show that 78% of Baldrige hospitals and 75% of the Magnet compare hospitals have a higher number of citizens <65 years old without health insurance. Sixty-seven percent of both Baldrige hospitals and Magnet hospitals used in the study surpass the 29.8% national average for >25 year olds with a bachelor degree.

Table IV: Malcolm Baldrige and Magnet Hospital Demographics

Institution	Location	Baldrige Year	Magnet Year(s)	Classification	>25yo with Bachelor degree or higher	Under 65 without health insurance	Median House-Income
Charleston Area Medical Center	Charleston, WV	2015		Health System	39.7%	13%	$48,442
Baptist Health	Lexington, KY		2005, 2010, 2015	Health System	41.2%	12.6%	$49,778
Riverside Methodist	Columbus, OH		2006, 2010, 2015	Health System	34.4%	14.6%	$45,659
Sentara Martha Jefferson	Charlottesville, VA		2006, 2011, 2016	Health System	49.8%	11.6%	$49,775
Hill County Memorial	Fredericksburg, TX	2014		Small Community	36.6%	18.8%	$48,991
Christus Hospital	Beaumont, TX		2007, 2012	Small Community	23%	25.2%	$40,992
Baylor Scott & White	Plano, TX		2012	Med Community (112 bed)	54.9%	14.1%	$83,793
St. David's Medical Center	Austin, TX	2014		Teaching Hospital	46.9%	19.5%	$57,689
University Hospital	San Antonio, TX		2010, 2015	Teaching Hospital	25.0%	21.6%	$46,744
Memorial Herman	Houston, TX		2014	Teaching Hospital	30.4%	29.0%	$46,187
Sutter Davis Hospital	Davis, CA	2013		Small Community (48 bed)	72.5%	7.6%	$56,463

Sharp Mary Birch Hospital Women/Newborn	San Diego, CA		2015	Med Community (171 bed)	43.0%	15.7%	$66,116
North Bay Healthcare	Fairfield, CA		2014	Med Community (132 bed)	24.1%	11.1%	$67,364
North Mississippi Health Services	Tupelo, MS	2012		Health System	28.4%	15.3%	$41,487
Univ. Alabama Birmingham	Birmingham, Al		2002,2006, 20110,2015	Health System	24.2%	18.5%	$31,061
Vanderbilt Univ. Hospitals & Clinics	Nashville, TN		2006, 2012	Health System	36.7%	17.1%	$47,621
Univ. of Tennessee Medical Center	Knoxville, TN		2011, 2016	Teaching Hospital	29.3%	14.8%	$34,226
Henry Ford Health System	Detroit, MI	2011		Health System	13.5%	18.9%	$25,764
Mercy Health St. Mary	Grand Rapids, MI		2013	Health System	31.6%	14%	$40,355
Cleveland Clinic	Cleveland, OH		2003,2008, 2013	Health System	15.6%	16%	$25,157
Metro Health	Cleveland, OH		2005,2010 2015	Health System	15.6%	16%	$25,157
Advocate Good Samaritan Hospital	Downers Grove, Il	2010		Large Community	52.5%	5.5%	$83,513
Edward Hospital	Naperville, IL		2005,2010, 2014	Large Community	65.5%	5.7%	$109,468
Elmhurst Hospital	Elmhurst, IL		2015	Large Community	57.9%	5.3%	$96,486
Central Dupage Hospital	Winfield, IL		2010, 2015	Large Community	50.2%	6.6%	$91,409
AtlantiCare	Egg Harbor, NJ	2009		Teaching Hospital	30.6%	11.1%	$74,409
Hackensack	Hackensack, NJ		1995,199, 2003,2009,2014	Teaching Hospital	34.1%	21.0%	$55,289
University Medical Center of Princeton at Plainsboro	Princeton, NJ		2012	Teaching Hospital	78.8%	4.6%	$114,645
Saint Peters	New Brunswick, NJ		1998,2002, 2006,2011,2016	Teaching Hospital	20.4%	28.9%	$38,435
Mosaic (formerly Heartland Health)	Saint Joseph, MO	2009		Large Community Hospital	19.2%	16.8%	$43,298
Unity Point Health-St Lukes	Cedar Rapids, IA		2009, 2014	Large Community Hospital	30.6%	8.1%	$53,581
Boone Hospital Center	Columbia, MO		2005,2009	Large Community Hospital	55.5%	8.3%	$44,907
Saint Luke's Hospital	Kansas City, MO		2004,2009,2014	Large Community Hospital	32.3%	17.4%	$45,821

Overall Hospital Rating:

A hospital's overall rating is a percent of patients that give an organization a 9 or 10 on a 0-10 rating scale. Using any number from 0 to 10, where 0 is the worst hospital possible and 10 is the best hospital possible, patients answer this question on post discharge surveys. Figure 1 compares Malcolm Baldrige hospitals and their comparison Magnet hospitals overall hospital rating scores from 2009 to 2015 in graph format. Table V shows the average scores of Baldridge and Magnet hospitals by year.

Figure 1: Overall Hospital Rating Graphs: Percent of Patients Rating Hospital as a 9 or 10

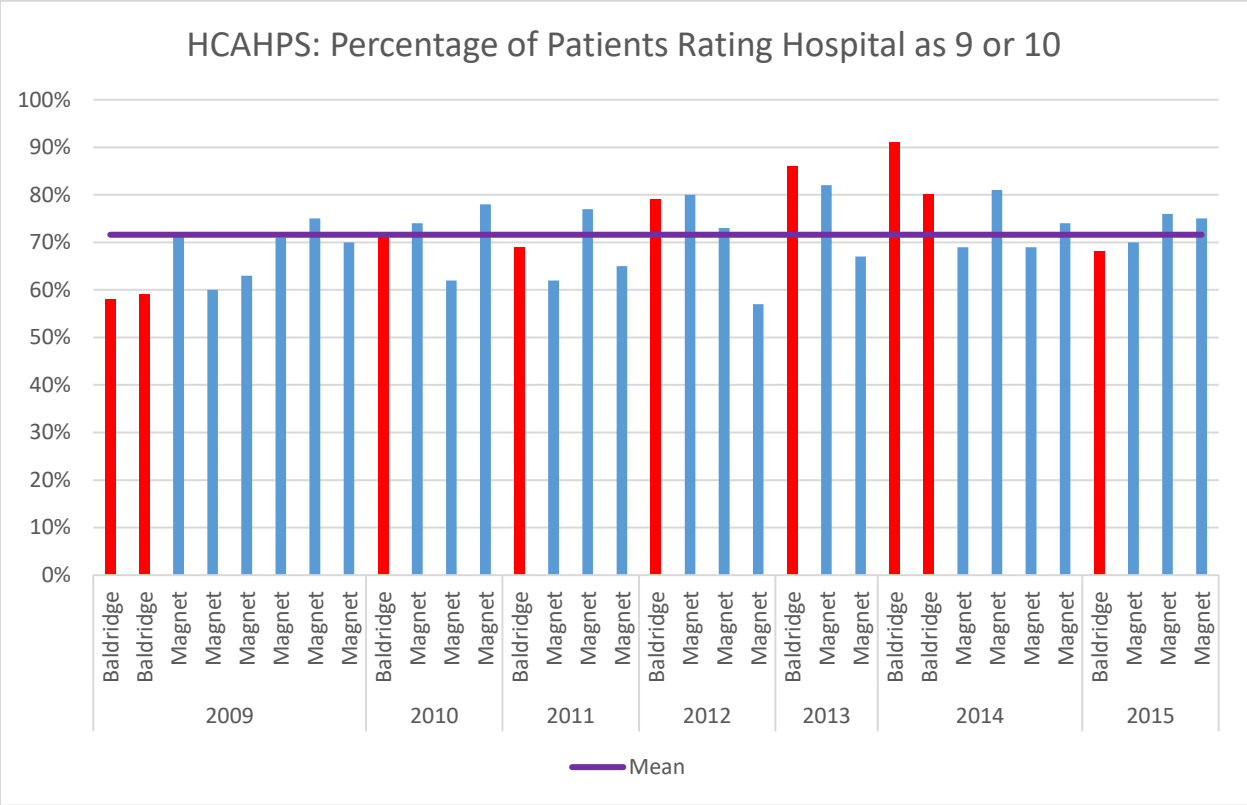

Table V: Overall Hospital Rating Table: Percentage of Patients Rating Hospital as 9 or 10

Year	Baldridge (Mean)	Magnet (Mean)
2009	58.5%	68.5%
2010	71.0%	71.3%
2011	69.0%	68.0%
2012	79.0%	70.0%
2013	86.0%	74.5%
2014	85.5%	73.3%
2015	68.0%	73.7%

Between the years of 2009 and 2015, the hospitals that were awarded the Malcolm Baldrige award for quality had patients rate their hospitals overall rating either 9 or 10 on a scale of 0 to 10, 73.4% of the time. During this same time frame the 24 comparison Magnet hospitals patients rated their hospitals overall rating as a 9 or 10, 70.9%. In four of the seven years (2011, 2012,

2013, 2014), Malcolm Baldrige hospitals on average had a higher overall rating than Magnet hospitals 57% of the time.

Willingness to Recommend

A hospital's willingness to recommend score indicates a patients' response / perceptions of their hospital visit. This score indicates if they are likely to recommend a particular hospital to family and friends. The question posed to patients is, Would you recommend this hospital to your friends and family? Figure 2 compares Malcolm Baldrige hospitals and their comparison Magnet hospitals willingness to recommend scores from 2009 to 2015 in graph format. Table VI shows the average scores of Baldridge and Magnet hospitals by year.

Figure 2: Percentage of Patients Who Would Recommend Hospital to Family & Friends

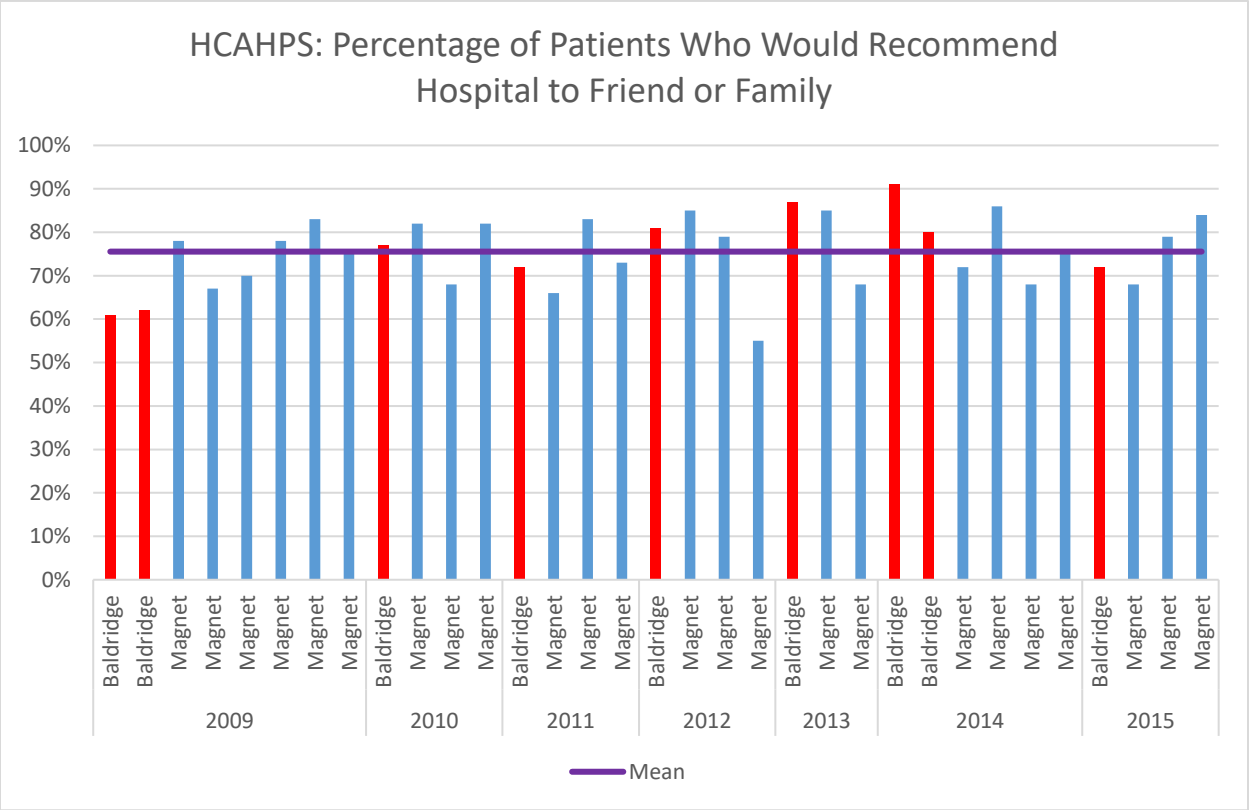

Table VI: Percentage of Patients Who Would Recommend Hospital to Family & Friends

Year	Baldridge (Mean)	Magnet (Mean)
2009	61.5%	75.3%
2010	77%	77.3%
2011	72%	74%
2012	81%	73%
2013	87%	76.5%
2014	85.5%	75.3%
2015	72%	77%

Between the years 2009 and 2015, the hospitals that were awarded the Malcolm Baldrige award for quality had an average willingness to recommend score of 75.9%. During this same timeframe the 25 compare Magnet hospitals had an overall hospital rating of 75.4%. During these years Malcolm Baldrige hospitals on average had a higher willingness to recommend score than Magnet hospitals in 2012, 2103, and 2014 or 43% of the time.

Congestive Heart Failure Mortality Rate:

Hospitals track and report their mortality rates. This is an indicator of the care, technology and standards of a hospital and an indicator of a patient's likelihood of death during an inpatient visit. Figure 3 compares Malcolm Baldrige hospitals and their compare Magnet hospitals Congestive Heart Failure Mortality Rates from 2009 to 2015 in graph format. Table VII shows the average scores of Baldridge and Magnet hospitals by year.

Figure 3: Congestive Heart Failure Mortality Rates

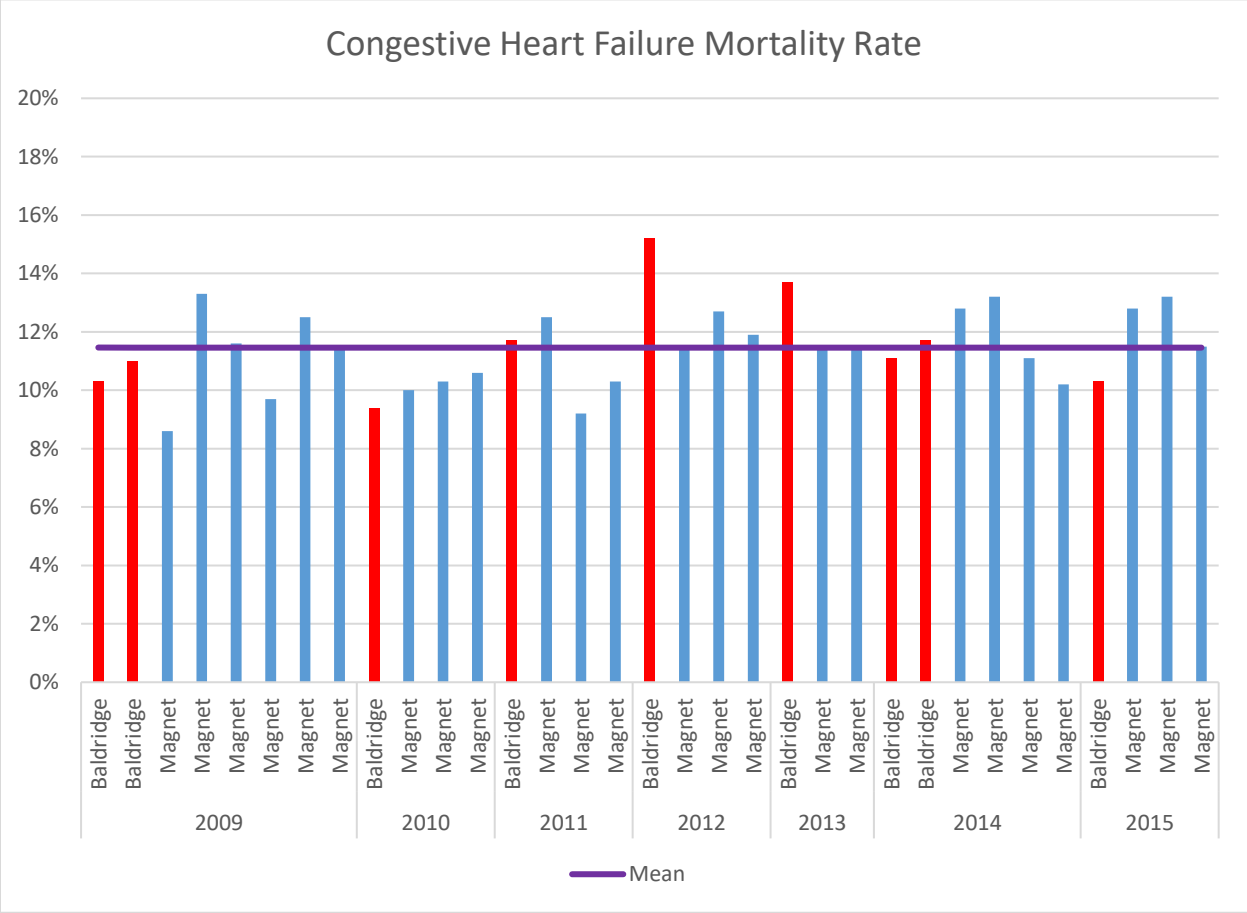

Table VII: Congestive Heart Failure Mortality Percent

Year	Baldridge (Mean)	Magnet (Mean)
2009	10.7%	11.2%
2010	9.4%	10.3%
2011	11.7%	10.3%
2012	15.2%	11.9%

2013	13.7%	11.5%
2014	11.4%	11.8%
2015	10.3%	12.5%

Findings: Congestive Heart Failure Mortality Rate

Between the years of 2009 and 2015, the hospitals that were awarded the Malcolm Baldrige award for quality had an average Congestive Heart Failure Mortality Rate of 11.6%. During this same timeframe the twenty-five compare Magnet hospitals had a Mortality Rate rating of 11.4%. During these years Malcolm Baldrige hospitals had a lower (better) average mortality rate score than Magnet hospitals in 2009, 2010, 2014, and 2015 or 57% of the time.

Summary of Findings:

During the years reviewed in this study Malcolm Baldrige hospitals had higher quality ratings in the categories of (1) overall hospital ratings; (2) willingness to recommend and (3) congestive heart failure mortality rates. Malcolm Baldrige hospitals scored higher than Magnet hospitals in the patient satisfaction categories with an overall hospital rating score of 73.4% and willingness to recommend score of 75.9% while Magnet scored 70.1% and 75.9% respectfully. Magnet designated hospitals scored better than Baldrige hospitals in the clinical category of patient mortality rate with an average rating of 11.4% compared to Malcolm Baldrige's score of 11.6%. The data in table 5 below shows the average outcome scores for both awards concluding that there is no statistical significance between the Malcolm Baldrige national award for quality and the Magnet Nursing Excellence designation when comparing and contrasting inpatient hospital quality scores.

Table VIII: Average Outcome Scores Across Baldridge and Magnet Awardees (all years)

	Baldridge (n=9)	**Magnet (n=24)**	**p value**
HCAHPS Rating	73.44%	70.91	0.4395
HCAHPS Recommend	75.89%	75.42%	0.8892

CHF Mortality	11.6%	11.41%	0.7460

Limitations:

The sample size for this study was significantly limited due to the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores being publicly reported data beginning in 2008. Along with this limitation there were two years (2008, 2011) where the Baldrige winner hospital was also a Magnet designee. Because of this they were eliminated from the study. The remaining nine Baldrige hospitals that could be used for the Malcolm Baldrige sample size which is half of the total number of Baldrige Healthcare winners. A larger sample size may have improved the comparative analysis.

DISCUSSION:

In general, Malcolm Baldrige hospitals have higher quality scores related to patient satisfaction. While no prior studies have compared outcomes across Magnet and Baldridge awardees, there is limited evidence that award status could influence quality outcomes. This trend was found in four studies where Malcolm Baldridge hospitals showed evidence of an increase in one or more quality metrics after obtaining Baldrige status. Magnet designated hospitals outscored their Baldrige comparison hospitals in the clinical category of patient mortality rate. These results are opposite of the study's original hypothesis stating Magnet status would lead to higher patient satisfaction and Baldrige would have overall quality and processes of care.

Hypothesis one: Hospitals with the Malcolm Baldrige Quality Award will have higher Process of Care and Quality of Care scores than Magnet hospitals. The rationale was because the pillars of Malcolm Baldrige apply to all entities that work in a hospital setting, i.e., facilities, food, etc. and not just the nursing workforce. I hypothesized that everyone working towards

higher quality standards would increase the overall patient quality of care. Results show just the opposite with Magnet hospitals having a slight edge over Baldrige.

Hypothesis two: Magnet designated hospitals will have higher scores on Patient Experiences than those who have received Baldridge designation. The rationale for this was because it is common that when patients think about their overall hospital experience they often think nursing. Magnet designation is an excellent recognition that only focuses on nursing excellence. If a hospital has put forth the time and effort to make nursing excellence a top priority it is believed this will reflect in patient responses and will exceed the patient experience scores than those who have only obtained Malcolm Baldrige. The results in fact showed the opposite with Baldrige hospitals having higher patient satisfaction scores.

When reflecting on the data I can't help my own bias as a nurse to help articulate the results and specifically why my hypothesis was off. The nursing team dominates any healthcare workforce and without a doubt has the most individual interaction with patients. A hospital that has obtained Magnet designation has made a considerable commitment to better their nursing workforce. Consumers have come to rely on Magnet designation as the ultimate credential for high quality nursing. Magnet hospitals have higher percentages of satisfied Registered Nurses (RN), lower RN turnover and vacancy, improved clinical outcomes and improved patient satisfaction (ANCC, 2016). Studies show that Magnet hospitals have higher quality scores than their non-magnet counterparts. We can now conclude that they also have higher scores than Baldrige hospitals as well.

This similar mindset of patient perception is what steered me to believe Magnet would have higher patient experience scores. It was assumed patients would associate their hospital

interactions with all clinicians as nurses. The results speak for themselves that Baldrige does include every healthcare professional and when it comes to the patient experience, every interaction they have is improved because all hospital workers are essentially on the Baldrige journey for excellence and the patients have noticed. The Affordable Care Act (ACA) created the Centers for Medicare and Medicaid Services value based purchasing program to transition Medicare toward integration and alignment between payment and a comprehensive definition of quality. The VBP was designed to reward hospitals for improving the quality of care by redistributing Medicare payments so higher-performing hospitals in terms of quality receive a greater portion of payment than do lower-performing hospitals (Centers for Medicare and Medicaid, 2012).

This makes hospital quality an important factor that hospitals must consider. Hospital transparency is another industry standard that is getting a lot of attention. Soaring costs force patients to shop around for doctors and treatment options. With patients having more on the line with their health care they also look at a hospitals outcome measures. Rarely are sample sizes reported on a hospitals website so although a specific outcome may not be statistically significant a patient may only see a difference of one or two percent which can be a deciding factor for them.

Future Studies:

The number of Malcolm Baldrige Healthcare recipients and Magnet Designated hospitals were severely limited in this study due to the fact that HCAHP data was not publicly reported until the year 2008. Healthcare quality will continue to be a top priority for anyone in the industry, especially with outside pressures from state and federal governments to improve quality

and reduce costs. With Magnet and Baldrige both carrying a reputation for high quality care it will be important for future studies to continue to compare these quality awards against each other, other awards and national averages to identify a path that gives hospitals the best chance for superior hospital quality. Achieving either of these awards requires a long and tedious process that can be costly. Future studies should also focus on the costs associated with achievement, maintaining and re-designation of the awards.

Summary:

Hospitals are under pressures from a variety of stakeholders to improve performance and quality across a comprehensive scorecard, which has become the basis for value based purchasing and reimbursement. When it comes to superior hospital quality hospitals often choose to focus on:

1) The Malcolm Baldrige Award for Quality and/or

2) Magnet designation for nursing excellence

Both are supported by evidence that they do in fact improve hospital quality, however, both come with a price. The design used was a retrospective analysis of archival data. Using data from the CMS Hospital Compare, this study examined three quality outcomes across all Malcolm Baldrige recipients between (2009-2015) and comparison hospitals who have obtained or received Magnet Designation.

During the years reviewed in this study Malcolm Baldrige hospitals had higher quality ratings in the categories of (1) overall hospital ratings (2) willingness to recommend (3) mortality rates 52.3% of the time. Malcolm Baldrige hospitals scored higher than Magnet hospitals in the patient satisfaction categories with an overall hospital rating score of 73.4% and willingness to recommend score of 75.9% while magnet scored 70.9% and 75.9% respectfully. Magnet designated hospitals scored better than Baldrige hospitals in the clinical category of patient mortality rate with an average rating of 11.4% compared to Malcolm Baldrige's score of 11.6%.

Based on this data there is no statistical significance between the Malcolm Baldrige national award for quality and the Magnet Nursing Excellence designation when comparing and contrasting inpatient hospital quality scores.

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Appendix

Appendix 1: Overall Hospital Rating

Institution	Location	2015	2014	2013	2012	2011	2010	2009	2008
Charleston Area Medical Center	**Charleston, WV**	**68%**							
Baptist Health	Lexington, KY	70%							
Riverside Methodist	Columbus, OH	76%							
Sentara Martha Jefferson	Charlottesville, VA	75%							
Hill County Memorial	**Fredericksburg, TX**		**91%**						
Christus Hospital	Beaumont, TX		69%						
Baylor Scott & White	Plano, TX		81%						
St. David's Medical Center	**Austin, TX**		80%						
University Hospital	San Antonio, TX		69%						
MD Anderson	Houston, TX		NA						
Memorial Herman	Houston, TX		74%						
Sutter Davis Hospital	**Davis, CA**			86%					
Sharp Mary Birch Hospital Women/Newborn	San Diego, CA			82%					
North Bay Healthcare	Fairfield, CA			67%					
North Mississippi Health Services	**Tupelo, MS**				**79%**				
Univ. Alabama Birmingham	Birmingham, Al				80%				
Vanderbilt Univ. Hospitals & Clinics	Nashville, TN				73%				
Univ. of Tennessee Medical Center	Knoxville, TN				57%				
Henry Ford Health System	**Detroit, MI**					69%			
Mercy Health St. Mary	Grand Rapids, MI					62%			
Cleveland Clinic	Cleveland, OH					77%			
Metro Health	Cleveland, OH					65%			
Schneck Medical Center	**Seymour, In**					**73%**			
Hendrick's Regional Medical Center	Danville, IN					79%			
Good Samaritan	Vincennes, IN					75%			
Marion General Hospital	Marion, IN					70%			
Advocate Good Samaritan Hospital	**Downers Grove, Il**						**71%**		
Edward Hospital	Naperville, IL						74%		
Elmhurst Hospital	Elmhurst, IL						62%		
Central Dupage Hospital	Winfield, IL						78%		
AtlantiCare	**Egg Harbor, NJ**							**58%**	
Hackensack	Hackensack, NJ							72%	
University Medical Center of Princeton at Plainsboro	Princeton, NJ							60%	
Saint Peters	New Brunswick, NJ							63%	

Mosaic (formerly Heartland Health)	**Saint Joseph, MO**							**59%**	
Unity Point Health-St Lukes	Cedar Rapids, IA							71%	
Boone Hospital Center	Columbia, MO							75%	
Saint Luke's Hospital	Kansas City, MO							70%	
Poudre Valley Health System	**Fort Collins, CO**								73%
CHI Health Lakeside	Omaha, NE								

Appendix 2: Willingness to Recommend

Institution	Location	2015	2014	2013	2012	2011	2010	2009	2008
Charleston Area Medical Center	**Charleston, WV**	**72%**							
Baptist Health	Lexington, KY	68%							
Riverside Methodist	Columbus, OH	79%							
Sentara Martha Jefferson	Charlottesville, VA	84%							
Hill County Memorial	**Fredericksburg, TX**		**91%**						
Christus Hospital	Beaumont, TX		72%						
Baylor Scott & White	Plano, TX		86%						
St. David's Medical Center	**Austin, TX**		80%						
University Hospital	San Antonio, TX		68%						
MD Anderson	Houston, TX		NA						
Memorial Herman	Houston, TX		75%						
Sutter Davis Hospital	**Davis, CA**			87%					
Sharp Mary Birch Hospital Women/Newborn	San Diego, CA			85%					
North Bay Healthcare	Fairfield, CA			68%					
North Mississippi Health Services	**Tupelo, MS**				**81%**				
Univ. Alabama Birmingham	Birmingham, Al				85%				
Vanderbilt Univ. Hospitals & Clinics	Nashville, TN				79%				
Univ. of Tennessee Medical Center	Knoxville, TN				55%				
Henry Ford Health System	**Detroit, MI**					72%			
Mercy Health St. Mary	Grand Rapids, MI					66%			
Cleveland Clinic	Cleveland, OH					83%			
Metro Health	Cleveland, OH					73%			
Schneck Medical Center	**Seymour, In**					**76%**			
Hendrick's Regional Medical Center	Danville, IN					83%			
Good Samaritan	Vincennes, IN					79%			
Marion General Hospital	Marion, IN					66%			
Advocate Good Samaritan Hospital	**Downers Grove, Il**						**77%**		
Edward Hospital	Naperville, IL						82%		

Elmhurst Hospital	Elmhurst, IL						68%		
Central Dupage Hospital	Winfield, IL						82%		
AtlantiCare	**Egg Harbor, NJ**							**61%**	
Hackensack	Hackensack, NJ							78%	
University Medical Center of Princeton at Plainsboro	Princeton, NJ							67%	
Saint Peters	New Brunswick, NJ							70%	
Mosaic (formerly Heartland Health)	**Saint Joseph, MO**							**62%**	
Unity Point Health-St Lukes	Cedar Rapids, IA							78%	
Boone Hospital Center	Columbia, MO							83%	
Saint Luke's Hospital	Kansas City, MO							76%	
Poudre Valley Health System	**Fort Collins, CO**							81%	
CHI Health Lakeside	Omaha, NE								

Appendix 3: Mortality Rate

Table IV

Institution	Location	2015	2014	2013	2012	2011	2010	2009	2008
Charleston Area Medical Center	**Charleston, WV**	**10.3%**							
Baptist Health	Lexington, KY	12.8%							
Riverside Methodist	Columbus, OH	13.2%							
Sentara Martha Jefferson	Charlottesville, VA	11.5%							
Hill County Memorial	**Fredericksburg, TX**		**11.1%**						
Christus Hospital	Beaumont, TX		12.8%						
Baylor Scott & White	Plano, TX		13.2%						
St. David's Medical Center	**Austin, TX**		**11.7%**						
University Hospital	San Antonio, TX		11.1%						
Memorial Herman	Houston, TX		10.2%						
Sutter Davis Hospital	**Davis, CA**			**13.7%**					
Sharp Mary Birch Hospital Women/Newborn	San Diego, CA			11.5%					
North Bay Healthcare	Fairfield, CA			11.4%					
North Mississippi Health Services	**Tupelo, MS**				**15.2%**				
Univ. Alabama Birmingham	Birmingham, Al				11.5%				
Vanderbilt Univ. Hospitals & Clinics	Nashville, TN				12.7%				
Univ. of Tennessee Medical Center	Knoxville, TN				11.9%				
Henry Ford Health System	**Detroit, MI**					**11.7%**			

Mercy Health St. Mary	Grand Rapids, MI					12.5%			
Cleveland Clinic	Cleveland, OH					9.2%			
Metro Health	Cleveland, OH					10.3%			
Schneck Medical Center	**Seymour, In**					**13.4%**			
Hendrick's Regional Medical Center	Danville, IN					12.3%			
Good Samaritan	Vincennes, IN					14.2%			
Marion General Hospital	Marion, IN					12.5%			
Advocate Good Samaritan Hospital	**Downers Grove, Il**						**9.4%**		
Edward Hospital	Naperville, IL						10%		
Elmhurst Hospital	Elmhurst, IL						10.3%		
Central Dupage Hospital	Winfield, IL						10.6%		
AtlantiCare	**Egg Harbor, NJ**							**10.3%**	
Hackensack	Hackensack, NJ							8.6%	
University Medical Center of Princeton at Plainsboro	Princeton, NJ							13.3%	
Saint Peters	New Brunswick, NJ							11.6%	
Mosaic (formerly Heartland Health)	**Saint Joseph, MO**							**11%**	
Unity Point Health-St Lukes	Cedar Rapids, IA							9.7%	
Boone Hospital Center	Columbia, MO							12.5%	
Saint Luke's Hospital	Kansas City, MO							11.5%	
Poudre Valley Health System	**Fort Collins, CO**								12.2%
CHI Health Lakeside	Omaha, NE								