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Assessing Patient Care Quality from Hospital Employed Physicians

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ASSESSING PATIENT CARE QUALITY FROM HOSPITAL EMPLOYED PHYSICIANS

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ABSTRACT

Background: Physician employment by hospitals and healthcare systems has become a growing phenomenon in America. Also the emphasis on improving patient care quality is receiving increasing attention. Moreover, recent changes in federal regulation and reimbursement have made improving patient care quality an imperative for hospitals and their medical staffs. The purpose of this study was to determine if there is a demonstrable relationship between hospital employed physicians and the quality of their patient care.

Methods: Physician quality measurements were obtained from a prominent community hospital with roughly one third of its medical staff directly employed by the hospital. A number of quality metrics are collected on a monthly basis for all the hospital's medical staff members, both employed and in independent practice. Three widely accepted quality metrics were chosen to abstract and use as dependent variables, average length of stay, adjusted mortality rates, and readmissions within 30 days for the same diagnosis. With employment as the predictor, (independent variable), fifteen quarters of quality observations were analyzed to determine if there was a relationship between employed physicians and quality care. A fixed effects panel regression model was used to test the within subject relationships over a three year period.

Results: There was no significant relationship found between employed physicians and their quality of patient care in this study. There was some marginal significance found in

a few quarters of observation related to average length of stay and mortality, when compared to the base period. But the overall results did not indicate a relationship between employment and quality.

Conclusion: The study found no association between employed physicians and their patient care quality. The study did not support that there was a difference in patient care quality from employed physicians. The hypothesis that there is a positive relationship between hospital employed physicians and patient care quality was not demonstrated in this study.

Keywords: Employed Physicians; Quality

DEDICATION

I would like to dedicate this doctoral dissertation to my lovely wife Pamela, for her steadfast support and sacrifice during the process.

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LIST OF ABBREVIATIONS

ACA	Affordable Care Act
ACO	Accountable Care Organization
AHRQ	Agency for Healthcare Research and Quality
ALOS	Average Length of Stay
CAHPS	Consumer Assessment of Healthcare Providers System
CMS	Center for Medicare Services
CQI	Continuous Quality Initiative
DRGs	Diagnostic Related Groups
EMR	Electronic Medical Record
FDA	Federal Drug Administration
FFS	Fee for Service
HCA	Hospital Corporation of America
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
HDHP	High Deductible Health Plan
HHS	Health and Human Services
HITECH	Health Information Technology for Economic and Clinical Health
HMO	Health Maintenance Organization
HQA	Hospital Quality Alliance
IOM	Institute of Medicine
JCAHO	Joint Commission for the Accreditation of Healthcare Organizations
LOS	Length of Stay
MGMA	Medical Group Management Association

NQF	National Quality Forum
P4P	Pay for Performance
PCORI	Patient Center Outcomes Research Institute
POS	Point of Service
PPO	Preferred Provider Organization
QI	Quality Initiative
RBT	Resource Based Theory
RCP	Royal College of Physicians
TQM	Total Quality Management

CHAPTER 1

INTRODUCTION

A Brief History

It is the intent of this study to assess the quality of patient care rendered by employed physicians as compared to themselves before employment, and physicians currently in independent practice. With considerable attention to both physician employment and quality patient care, a study of this nature seems plausible, and useful.

The practice of medicine and surgery in America has progressed both politically, culturally and technically since the days of the Flexner report. A brief history of physician practice evolution is useful in setting the stage for what is seen in current trends and arrangements. Abraham Flexner studied the state of medical training and published his report in 1910, but the fundamentals of this study have relevance today in that it focused on the quality of patient care as a product of medical education. As might be expected there was a relationship to profitability of schools, number of physician graduates, cost of medical education, and risk to society much like we see today (Flexner, 1910).

The general acceptance and resultant changes in medical education after the Flexner report were significant, including fewer but better trained clinicians providing a higher level of patient care quality, even though the report focused largely on education

and less on quality of care. The Flexner report also marked the beginning of the end for proprietary medical education (Duffy, 2011).

As a result of the Flexner report, improved medical education ushered in what could perhaps be called the golden era of healthcare. Improvements in technique, knowledge, tools and pharmacology were spurred not only by higher quality education, but by World Wars I and II, the Korean War, and Vietnam War. Substantive changes in reimbursements for physicians cannot be underemphasized during this period either. Yet much of medical practice in America could still be construed as a "cottage industry", where the rise of medical specialization and fiercely independent autonomous practice was still prevalent (Swensen et. al., 2010). However, the concept of independent autonomous medical practice is changing, and has changed in two distinct periods of time.

The delivery model for healthcare has transitioned from independent groups to multispecialty group practices; from episodic care to a continuum of care; from individuals making decisions to a team approach. The concept of evidenced based practice emerged. Fee for service (FFS) and bundled payment and reimbursement plans focused on population health, and the move away from incentives that rewarded volume to a system that rewards (or penalizes) outcomes have become the current process. The aforementioned issue of reimbursement for physicians has played a significant role in how medical/surgical practice is provided today. In 1993, law professor Vernellia Randall wrote:

> "Over the last one hundred years, America's health care system has undergone several major changes. It has moved from a home-based

> system to a hospital- based system. It has moved from a nursing care-based system to a technology- based system. It has moved from a patient driven system to a provider-driven system. Indications are that healthcare will become less hospital centric in the future and more patient centric. Each change introduced not only advances health care, but also introduces negative aspects. Perhaps, the negative features that were introduced into the system might have been avoided if more attention had been paid to the down side of changes occurring in the health care system. The health care system is again undergoing major changes as it moves from a provider- driven system to a third-party payer-driven system" (Randall, 1993, p.1).

Managed care and IT are forcing physicians to enter into various affiliations, including employment, to achieve economies of scale and to have access to contracts. Furthermore, transparency has introduced the concept of a 'value proposition' to consumers and payers.

The transition to a predominantly third party payer-driven system began with the introduction of Medicare and Medicaid in 1965, and progressed during the late 1980s and early 1990s with the advent of managed care (Centers for Medicare and Medicaid Services [CMS], 2012; Lagoe, Aspling, & Westert, 2005). It was during the late 1980s and early 1990s that the first distinct shift in physician practice phenomena occurred where they were becoming employees of hospitals and systems. The growing number of patients whose healthcare was being reimbursed via managed care plans, whether a health maintenance organization (HMO) or a preferred provider organization (PPO), took

a measure of control from physicians and began to impact their practice and reimbursements in multiple ways. Physicians began to experience a significant "hassle factor", and at the same time saw their income and even decision making authority diminish (Warren, Weitz, & Kulis, 1999).

The First Wave of Physician Employment

As more and more managed care plans swept the country, institutional providers such as hospitals and healthcare systems began to develop their own managed care plans in an attempt to have better control of their patient, (and physician), market share. Institutional sponsors of managed care plans began to vertically integrate by purchasing physician practices and physicians who were increasingly disenchanted with the burden of managed care participation and reimbursement, and those physicians became employees (Zwanziger & Melnick, 1996).

The California health plan Kaiser Permanente is a good example of large vertically integrated systems. There were other entities that came on line seeking to align with physicians, the for profit physician companies, PhyCor, and MedPartners. In 1988 the Nashville company PhyCor was started by some former Hospital Corporation of America (HCA) executives. This publically traded company saw an opportunity to capitalize on the growing dissatisfaction among physicians dealing with managed care, and offered help in managing the increasingly complex day to day milieu of managed care. While PhyCor did not actually employ physicians, they controlled the "back office" function such as billing and personnel management, contract negotiations, and did hold some of their assets. MedPartners also became a significant provider of physician practice management services, and at one time was intending to sell to PhyCor. But that

transaction did not occur when MedPartners shifted its core business focus (Funding Universe, 2001).

By 1999 both MedPartners and PhyCor had begun to spin down their physician management services and ceased operations on the scale it was in the early 90s. Furthermore, many of the hospitals and healthcare systems that also employed physicians began to dissolve their purchase arrangements. This era of initial physician migration to employment or linkages with non-physician business companies was important because it was the first major change of this type affecting the practice of medicine and surgery in America.

The second distinct change in the independent practice of medicine is occurring now with much more aggressive purchasing of physician practices by hospitals, healthcare systems and even insurance companies (Gamble, 2011). Much of the rationale for the resurgence of physician practice purchases is still the influence of a more mature managed care market. There are variations in those data tracking managed care enrollments, but the trend is relatively clear. One data source reveals a steady increase in managed care enrollment. Statistics collected by the CMS, show Medicaid Managed care enrollments rose from 57.58% in 2002, to 74.22% in 2011. Another leading resource for business information is MCOL. Statistics from 2011 as compiled from this group included data from Kaiser State Health Facts, and the U.S. Census Bureau. In 2011, the national managed care enrollment was 210 million lives in one of the following organization types; HMO, PPO, point of service (POS), or high deductible health plan (HDHP), and MCOL.

Of those 210 million Americans, managed care enrollment as a percentage of the total United States population within the coverage categories shows wide variation. Twenty five percent of the Medicare population is in a managed care program, 71.2% are in a Medicaid managed care plan, 100% of the military are covered by a managed care plan, 99% of commercial insurance covered lives are via managed care, but 50.7 million of the population has no medical coverage at all. All totaled, 67.5% of the population in America are covered by some form of managed care (MCOL research and related data sources 2013).

So while there might be variations in the numbers and the way they are published, the trend and prevalence of managed care in America today is evident. And the relevance to the physician employment trend illustrated here relates to physicians ability to contract with these managed care companies with more negotiating clout. And that clout is more available when physicians are in large multispecialty groups with a broad patient base, or are employees of hospitals or healthcare systems with similar or greater influence.

Different Times Now

What is different at this time is the added effect of the ACA signed into law in March of 2010. Although the full effects of this sweeping health reform law will not be known for several years yet, the unknowns and uncertainties of this legislation is causing accumulative stress on the entire healthcare system and physicians. In a recent article on physician stress and burnout, 46 % of the physicians cited healthcare reform and 41% cited policy changes implemented by CMS as the major external causes of dissatisfaction (Rosenstein, 2012).

Therefore, the cumulative effect of increased growth of managed care payment sources and the uncertainties of health care reform have increased the overall burden on physician practice nationwide. In addition, the other increasingly important factor leading to changes in physicians leaving independent practice is declining income. One of the key features of managed care contacting is discounting fees from physicians and hospitals. In addition, the Medicare physicians' fee schedules have been threatened with decreases since 2002. For example, a 23% cut was scheduled for 2010; a 24.9% cut was scheduled for 2011; a 27.4% cut for 2012, and a 26.5% cut was scheduled for 2013. However, Congress has deferred these cuts routinely except for the 2% cut that will go into effect as a result of sequestration on April 1 2014 (APTA, 2013; Ginsburg, 2011; Porter, 2008). There is evidence that guaranteed first year incomes for hospital employed physicians are higher than those of independent practitioners, (MGMA, 2010). Furthermore, many newly graduated physicians opt for employment for lifestyle reasons which appear to be better as a hospital employee (Kocher, Nikhil, & Sahni, 2011; MGMA, 2010). There are myriad factors and multiple forces converging to create pressure for physicians to become employed. At the macro environmental level, there is evidence that the entire healthcare system has undergone changes that have affected the traditional hospital/medical staff relationship. And because of these changes, the current and historic relationships between physicians and hospitals are not sustainable (Carlson & Greely, 2010). Gone are the days of the cottage industry of healthcare where the physician was the "captain" of a small team of staff, mostly nurse driven, and the administration, or "superintendent", presided over a far less complex organization that acted as the physician's workshop. Increasing regulatory, economic and organizational

issues have created an environment where physicians and hospitals have been compelled to explore various relationships in order to survive and thrive. These relationships have taken various forms of affiliation from loose association to full employment (Cuellar & Gertler, 2006). These new relationships have tended to work better in an environment that has changed as much as it has over the past 20 years. Closer relationships between physicians and hospitals have improved the ability of both parties to deal with managed care contracting, and overall better coordination of quality patient care (Casalino, Devers, & Brewster, 2003).

The issue of "transparency" within the American healthcare system has received a lot of press in the past 5 years. Perhaps as much as any other factor, the wide variation in quality and outcomes associated with the same in costs have spurred the demand for more transparency. Coupled with newer more comprehensive data collecting and reporting capabilities, (via information technology, electronic medical records etc.), transparency is receiving more attention. One of the significant catalysts for the focus on healthcare transparency is Dr. John Wennberg's publication of the Dartmouth Atlas of Health Care. This body of work illustrates the variations in health outcomes and cost, and points to the disparity of cost versus outcomes across America from institution to institution. As might be expected, this new knowledge has caught the attention of payers both private and governmental. Thus transparency has become more of a recurring theme in healthcare literature.

A potential end result of transparency of healthcare cost and quality is increased demand for better physician hospital relations. There is some evidence that physicians in private practice have little concern for how their clinical and financial decisions affect

hospitals (Madison, 2004). Moreover, physicians that are not aligned or employed by hospitals are more likely to compete with hospitals. In contrast, physicians that have a vested interest in the financial outcome of their decisions are more cost conscious (Burns & Wholey, 1992; Fisher, Staiger, Bynum, & Gottlieb, 2006; Shortell et al. 2001). In an employment model, physicians are encouraged by their contractual arrangements to have a financial interest in the outcomes of their clinical decisions, "and" quality of care. It affects both their reputation and that of their employer, as illustrated by the increasing transparent environment.

Quality, Reimbursement, and Employment

Thus far the focus of discussion has been on factors leading to the current trend of physicians' leaving independent practice to become employees of hospitals and insurance companies. There is evidence of serious concerns about the quality of healthcare services in America reported in a groundbreaking publication by the Institute of Medicine, (IOM), "To Err is Human" (IOM-1, 1999). In an attempt to address the serious quality issues documented in the first report, there was a second report, "Crossing the Quality Chasm" (IOM-2, 2001). The former revealed a dismal pattern of patient harm and deaths due to medical errors. The second report outlined a system for sweeping redesign of the American healthcare system.

There has been substantial attention paid to the "Crossing the Quality Chasm" report, and ongoing literature on healthcare quality concerns. However, even recently there have been numerous media reports on the number of medical instruments and sponges left in patients after surgery (between 4500 and 6000 annually; Eisler, 2013). This is just one example of ongoing issues surrounding patient safety and quality. A

USA Today article cited the IOM report and noted that the National Quality Forum suggested steps to track and reduce the incidence of retained instruments and sponges, yet there is still no national mandate for reporting, and the alarming rate of these types of surgical mistakes continue (USA Today, 2013).

So is there a relationship between quality and reimbursement and physician employment? When looking at reimbursement for healthcare services, the element of healthcare cost is implied simply because reimbursement of all types, to both institutional and physician providers, relates to their cost and profit. Perhaps one of the more telling statistics relating to quality of health services and cost of health services is seen in the quality ranking of American healthcare and the cost of those services compared to similar services in other countries. A 2010 report from the Commonwealth Fund indicates that American healthcare ranks last when compared to six other countries: Canada, Australia, Germany, The Netherlands, Great Britain, and New Zealand. The dimensions assessed were, access, patient safety, coordination, efficiency, and equity. Furthermore, these rankings were the same for 2004, 2006, and 2007 (Davis, Schoen, & Stemikis, 2010).

In the summer of 2012, the CMS released data on national healthcare spending. Those data revealed national expenditures of 2.7 trillion dollars, a 3.9% increase over the prior year, with estimations that it will continue to increase. These nationwide expenditures equate to $8.660 per person, roughly $3,660 more than the next most expensive countries health care, (Switzerland and Norway), who spends around $5,000 per capita (CMS, 2012; Herman, 2012).

There seems to be contradiction between the high quality one might expect from such expenditures versus what some data would indicate, particularly when compared to

other countries that spend far less. It also seems to be in stark comparison to declining physician income and the migration away from independent private practice to become employees of hospitals or insurance companies. The trend of physicians becoming those types of employees is more associated with financial, market share and work life issues than quality patient care. But there is a relationship because of the new regulations linking quality and reimbursements.

Another aspect that is not clear is the relationship between the quality of health services and physician employment by hospitals. There is scant literature that speaks directly to this relationship, despite the fact that measures are being taken by healthcare systems to assess quality outcomes on a per physician basis.

Issues of Reimbursement and Quality

Given the American expenditures on healthcare, most of which is funded by the State or Federal government, CMS has enacted several initiatives that tie reimbursement to quality. For example, for three particular diagnostic codes, heart failure, pneumonia and acute myocardial infarction, readmissions for the same diagnosis within 30 days from discharge will result in a reduction of Medicare reimbursement of at least 1%. This percentage increases over time if the problem continues (CMS, 2012). Since Medicare reimburses several entities for similar forms of care, (for example reimbursement for physical therapy in the acute care setting, and post-acute care setting), bundled payment mechanisms are proposed as a demonstration project within the ACA. This form of one source payment grants comprehensive payment for all providers to one acute care provider. The recipient of the payment will then distribute the funding across the number of different providers in an attempt to improve quality by better coordination of care.

Value based purchasing is another concept that has been touted as a mechanism to improve quality by promoting more rigorous health plan selection and contracting according to the quality of care the plans provide. And the use of incentives and disincentives are used as financial rewards or penalties for plans that provide higher or lesser quality (ViHoio et al., 2003). Even though the concept of value based purchasing has been known for about 20 years, there is evidence that using value based purchasing processes is not used by employers when selecting health plans. Some larger employers are using their purchasing power, at least a little, more than smaller employers', but neither are using value based purchasing strategy very often for choosing health plans (Rosenthal et al., 2007). However, hospitals and healthcare companies are increasingly focusing on the provisions of value based purchasing because their reimbursement in part is based on how well the hospital and medical staff performs according to the core clinical measures and patient assessment scores.

Pay for performance (P4P) is another plan adopted by CMS to improve quality and was incorporated in the ACA. Components of the plan go into effect in 2013; however, characteristics of P4P have been tested before. CMS in partnership with Premier Inc., a national healthcare company, launched a study in 260 hospitals. The results of this demonstration project showed that the P4P hospitals did achieve higher performance scores than the control group. However, after five years the scores between the two groups of hospitals were virtually identical. Larger better funded hospitals' tended to do better, particularly in less competitive environments (Werner, Kolstad, Stuart, & Polsky, 2011).

In another study involving the same data in the Premier demonstration, a team looked at 30 day mortality for patients with acute myocardial infarction, congestive heart failure, and pneumonia. The team used an even larger number of control hospitals, and found little difference in the mortality rates for P4P hospitals (Jha, Joynt, Orav, & Epstein, 2012). These are just a few of the reimbursement schemes that are being imposed on healthcare providers in an attempt to stimulate better quality care and control costs.

Purpose of the Study

The purpose of this study is to assess changes in quality following employment by hospitals. An assumption being made is that physicians employed by hospitals will have a different environment to work in, with different resources, and certainly some different expectations. Most physician employment contracts in this era are more specific in hospital requirements and expectations of performance. Increased focus and concern for improving patient care quality will require providers to monitor and demonstrate a measure of quality that is generally acceptable to all stakeholders.

Significance of the Study

Considering the concerns about health care quality as referenced in medical literature, there does not appear to be clearly identifiable data on the cause and effect of patient care quality, and cost, and the trend in physician employment by hospitals. And while healthcare cost will not be a primary focus of this study, the relationship between physician employment and the quality of their patient care is. Specifically, it is the intent of this study to add at least one new scholarly assessment of how the employment of physicians' by a prominent hospital may or may not affect patient care quality.

A study of this nature is significant to patients, payer sources, and healthcare leaders and providers everywhere. Issues of patient care quality will be a major theme in all of health care into the future, and most likely will gain in significance and focus.

Thus far this writing has already illuminated broad issues of quality care and the shift of independent physician practice to employment in hospitals, healthcare systems and insurance companies. Some reasons have been discussed that have caused this physician migration, but it is certainly not an exhaustive compilation of all the reasons. It may be important to illustrate the magnitude of the trend in physician employment by hospitals.

As published in a New York Times health article, data from the American Hospital Association indicated that from 2000 to 2010, the number of physicians employed by hospitals increased 32% to 212,000 doctors (Pear, 2012). According to a 2012 Merritt Hawkins report, 75% of America's physicians could be employees of hospitals by 2014 (Beulieu, 2012). Prior to these statistics, the Medical Group Management Association published a report indicating that 65% of established physicians were placed in hospital owned practices, and 49% of medical graduates hired out of residency were hired into hospital owned practices (MGMA, 2010).

Research Question

Considering the apparent trend of physician employment by hospitals, and the link between physician practice and quality patient care, a relevant question for this study is:

> RQ1: Are there differences in the quality of patient care as rendered by physicians who have become employees of hospitals?

Plan of Work

Since there is a wealth of data being collected on quality care, it seems reasonable to use established validated measures.

The study setting is a single prominent and substantive hospital that is part of a large healthcare system. Study measures will be generally accepted and refined indicators of quality patient care that are currently being collected on medical staff members. Data are collected on employed and non-employed medical staff members. Control variables will include physicians' specialty, age, and gender. The dependent variables, or quality indicators, will be collected and analyzed over an extended period of time, (in this case 15 quarters), in order to have sufficient time frames to assess the effects of physician employment on the quality of their patient care.

Quality Indicator Qualification

There are numerous organizations that have endorsed indicators predictive of quality. Prominent among them are the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO), the Agency for Healthcare Research Quality (AHRQ), the National Quality Forum, and the Commission on Quality Healthcare in America. Many of them have cited and endorsed overlapping indicators that have become the standard by which physician quality work has been measured, (Jencks, Huff, & Cuerdon, 2003; Romano, 2003). Of the many indicators used to measure patient care quality, three are singled out for this study.

Risk adjusted mortality is perhaps the single most significant measure of quality because of the obvious gravity of outcome. It is an indicator that crosses all physician specialty types, and relates to every patient. Hospital mortality rates refer to the

percentage of patients who die while in the hospital. Mortality rates are calculated by dividing the number of deaths among hospital patients with a specific medical condition or procedure by the total number of patients admitted for that same medical condition or procedure. This risk adjustment method is used to account for the impact of individual risk factors such as age, severity of illness and other medical problems that can put some patients at greater risk of death than others (Mayo Clinic, 2013).

The issue of readmission rates has become more important during the last 20 years because of declining lengths of stay. The length of stay in general acute care hospitals has been falling during that same time period secondary to the implementation of PPS. The decline in hospital lengths of stay started early in the implementation of PPS, and has continued to the present (Qian, Russell, Valiyena, & Miller, 2007). In response to the declining lengths of stay in hospitals, more patients have been discharged to nursing homes, and home care visits have increased. Furthermore, more vigilance is placed on untoward effects of early discharge and readmission because of certain emphasis on this subject contained in the ACA. Therefore it has become a relevant indicator of quality care because of payment penalties associated with readmission rates. These penalties reduce Medicare reimbursements to varying degrees for readmissions within 24 hours, and 30 days of discharge. Hospital readmission within 24 hours with the same diagnosis is not reimbursed at all by Medicare. Patients readmitted within 30 days with three particular diagnoses' create a hospital payment penalty of 1% in 2013, and increasing in the future. For patients discharged with a diagnosis of acute myocardial infarction, heart failure and pneumonia, they are all subject to penalties when readmitted within 30 days (CMS, 2012).

Length of stay (LOS) and average length of stay (ALOS) has long been a metric hospitals' use to manage operations'. At the introduction of PPS, in 1983, length of stay became even more important. Much more emphasis on length of stay was stimulated because Medicare payments were tied to a host of diagnostic related groups (DRGs) with a predicted length of stay target. The implications were profit driven because each diagnostic group or DRG carried a relatively fixed reimbursement. And if the hospital could treat and discharge the patient earlier than the target length of stay, it could keep any margin of reimbursement greater than the cost of services.

Therefore, length of stay could be considered a proxy for reimbursement and cost issues. And it is also viewed as a quality indicator by such organizations as AHRQ (Zhan & Miller, 2003). Most commonly, LOS is viewed as an indicator of hospital efficiency and as a surrogate measure for costs, with hospitals having long average LOSs considered relatively inefficient in the use of resources, and those with low LOSs considered being efficient.

Sometimes, however, LOS is assumed to relate to quality. For example, if hospitals were to respond to the financial incentives of prospective payment by attempting to lower costs by prematurely discharging patients (for profitable motive), LOSs significantly lower than expected might be considered indicative of poor quality care. On the other hand, if poor quality of care causes complications, it would tend to extend LOSs. One might then assume, longer than expected LOSs could be viewed as indicative of poor quality care (Thomas, Guire, & Hovart, 1997).

Quality and the Public

Emphasis on quality is prevalent in healthcare literature, the broader media, and the ACA. The AHRQ, JCAHO, CMS and the Medicare Quality Improvement Organization, have all been engaged in the improvement of patient care quality. Yet while some improvements have been observed from baseline performance improvements in quality performance since the publication of Crossing the Quality Chasm, more work needs to be done to realize more comprehensive improvements (Jencks et al., 2003). Nearly a decade before the publication of the Quality Chasm research, quality of patient care had been a public concern. Physicians, however, were less concerned about quality issues then the public (Robinson et al., 2002).

In another study concerning quality and medical errors, there was doubt expressed by both physicians and the public on the rate of medical errors pointed out in Crossing the Quality Chasm, and the conclusion was that medical errors were not the biggest problem in healthcare, nor was there an expression of urgency to address such issues (Blendon et al., 2002). There is even some literature that would indicate publicly reported quality information may inadvertently reduce the quality of patient care. For example physicians who are worried about their quality rankings may, to the extent possible, avoid taking certain sicker patients (Werner & Asch, 2005).

Much of the interest in quality of care has developed in response to the dramatic transformation of the health care system in recent years. New organizational structures and reimbursement strategies have created incentives that may affect quality of care. Although some of the systems are likely to improve quality, concerns about potentially negative consequences have complicated the whole quality issue. The concern about

quality arises more from fear and anecdote than from facts; there is little systematic evidence about quality of care in the United States. More information is available on the quality of airlines, restaurants, cars, and appliances than on the quality of health care (Schuster, McGlynn, & Brooks, 2005). But even in the conflicting and somewhat confusing dynamic of healthcare quality, particularly when assessing the public perception, the emphasis on quality healthcare is going to be an ongoing process in health regulation and reimbursement. Various quality watchdog, (the federal government), and other agencies, will remind us to improve it in the future. Therefore, this small study may have some slight relevance as it relates to patient care quality as provided by employed physicians.

CHAPTER 2

LITERATURE REVIEW

Healthcare Quality, the Early Days

Perhaps some of the earliest work on quality in healthcare can be ascribed to Florence Nightingale in the mid nineteenth century. During the Crimean war, Nightingale noticed that there was a relationship between the amount of nursing care they received, and survival rates. After the war, she did several studies to understand other components of care such as the resources used; the extent of nursing care, and the quality of outcomes. It was the foundation of the first broadly accepted nursing standards of care based on observation (Al-Assaf & Schmele, 1997).

During the early part of the twentieth century several U.S. surgeons began to assess the relationship between quality and outcomes. In 1914 a surgeon from the Massachusetts General Hospital studied surgical patients and their follow-ups, and from there published standards that included follow-up exams one year post surgeries. This study prompted the American College of Surgeons to develop criteria and standards for hospital accreditation. The year was 1918, and these standards were later adopted by the Joint Commission for Accreditation of Hospitals, now known as the Joint Commission for Accreditation of Hospitals and Healthcare Organizations (Al-Assaf & Schmele, 1997). Because of the adoption of criteria and standards of care, the Joint Commission

not only accredited hospitals that met those standards, but credentialed them as quality institutions as well.

Emphasis on quality in the healthcare setting continued through the 1950s with evaluation of primary care physicians, ambulatory surgery, and physician care provided in hospitals. By the 1970s, the quality assurance movement was developing and variations in quality provided by physicians' became more transparent with interesting consequences. As the issue of quality physician care became more visible, results deemed to be sub quality care created tensions between patient and doctor, and doctor and healthcare management. Furthermore, the legal system began to engage in more and more litigation sometimes with huge financial settlements and negative public relations (Shortell et al., 1995).

In a reaction to the increasing malpractice litigation happening in America's hospitals, the U.S. government stepped in and introduced the National Health Quality Improvement Act of 1986. This act created a clearinghouse for malpractice cases, suggested patients become better informed about medical procedures and doctors, and required institutions to report incidences of malpractice (Al-Assaf & Schmele, 1997). Unfortunately much of this act had to do with structure and little to do with process and outcome, key tenants of quality.

So as we have seen, Abraham Flexner saw a relationship between medical education and patient care quality. Florence Nightingale saw a connection between the adequacy of nursing care and the quality of soldiers' recovery. And several physicians in the early 1900s began to understand the relationship of what physicians and surgeons did, and quality outcomes. The federal government has instituted quality initiatives and

accrediting agencies like the Joint Commission has put forth standards of care and has credentialed healthcare operations as quality providers. But we have yet to discover a relationship between quality care and physicians as employees of hospitals.

Defining Quality, the Physicians Role

How does one define healthcare quality? Avedis Donabedian may be considered the leading thinker in quality assurance with his definition of quality medical care. He describes quality healthcare as the kind of care which is expected to maximize a comprehensive measure of patient welfare after one has taken into account the balance of expected gains and losses that goes along with the process of illness and health, (Donabedian, 1966). The IOM defines quality as the extent to which health services provided to individuals and patient populations improve desired health outcomes. The care should be based on the strongest clinical evidence and provided in a technically and culturally competent manner with good communication and shared decision making.

Another clear emphasis within this definition is the intent that healthcare quality should be highly patient centered (PeerPoint, 2012). In the IOM "Crossing the Chasm" report they further refined the quality issue and called for improvements in six dimensions of health care performance: safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity. It also asserts that those improvements cannot be achieved within the constraints of the existing healthcare system (Berwick, 2002; IOM, 2001).

Traditionally, issues of quality care and the attempts to control it have been directed toward the physician as "captain of the team". However, until relatively recently, hospitals and healthcare organizations have not routinely collected and analyzed

data on individual physicians care. Even before the now famous publication, "To Err is Human", and at the time when managed care was becoming a nationwide phenomenon, a study of over thirty thousand inpatients from 51 hospitals in New York State were reviewed for medical errors. There were a number of adverse events found, most of which were nonsurgical errors in diagnostic assessment, noninvasive therapeutic errors, events occurring in the emergency room, and management errors (Leape et al., 1991).

Even though hospitals must look to the physician as a primary team leader, the modern hospital environment utilizes a host of talent and resources and engages professionals from many departments. In other industries the transformation from a predominantly artesian driven system to one involving complex interactions between specialized departments and other professionals requires new methods of quality improvement. This is the current landscape of American healthcare, and more comprehensive integration of employed physicians is necessary to truly improve patient quality (Laffel & Blumenthal, 1989).

Physician Employment, Their Satisfaction, and Quality

Implication of Practice in Various Settings

As we have seen, physician employment is progressing at a fast pace around the country. But what is the satisfaction level of those employed doctors? Under managed care, physician satisfaction was not as negative nor their practice autonomy affected as bad as predicted (Baker & Cantor, 1993). In the early period of managed care development and hospital employment of physicians', it was thought that hospital control strategies would worsen physician-hospital relationships and conflicts, as well as overall physician satisfaction levels. In a Health Services Research article, it was found that

hospitals controls did not negatively impact physician satisfaction or integration. There were differences in how physicians viewed for profit versus not for profit hospitals, public hospitals versus multi facility health systems, but hospital controls did not negatively affect physician satisfaction. One interesting finding was that older physicians' appeared more secure, and employed physicians' were more satisfied because their roles were clearly defined in their employment contracts (Burns, Andersen, & Shortell, 1990).

Physician career satisfaction and morale has received great attention recently. There are reasons for this attention. First, physicians who are satisfied with their careers are likely to provide better health care than those that are unhappy. Physician satisfaction has been found to strongly correlate with patient satisfaction. Second, high physician satisfaction is also likely to result from good outcomes with patients. Satisfaction, therefore, may be an indirect measure of patient outcomes, and quality (Leigh, Kravitz, Schembri, Samuals, & Mobley, 2002).

One obvious indicator of physician job dissatisfaction is that they change jobs or retire. In another 2002 study measuring why physicians change jobs, certain indicators were evaluated via a survey from 1,939 questionnaires of both generalists and specialists. Traditionally physicians have expressed satisfaction with their practice if in the course of their patient care, there was a satisfying connection with their patients and they received gratitude from them. Also being satisfied with their community was important. But unhappiness about their income, being dissatisfied with several aspects of their practice, and unhappiness within the community were the most common reasons a doctor made a career change. Older physicians were typically more satisfied than younger ones, but

later in career physicians might likely change jobs once child rearing was done. Between specialist and generalist, discomfort with the community and concerns about income were the most common reasons for changing jobs (Pathman et al., 2002).

Other articles have alluded to the connection with employed physician job satisfaction and quality of care. But a Japanese study of employed physicians found no relationship between these two factors (Utsugi-Ozaki, Bito, Matsumura, Hayashino, & Fukuhara, 2009). On the contrary there is literature that suggest otherwise. Researchers in 2009 found that there was a strong correlation between dissatisfied physicians and the care they rendered. Furthermore, physician dissatisfaction was also reflected as patient dissatisfaction (Leigh et al., 2002). The MEMO study, (Minimizing Error, Maximizing Outcomes), a report by the IOM, studied the relationship between organizational culture, quality, and physician dissatisfaction. Emphasis on a culture of quality was shown to increase the likelihood of better patient care, and that dissatisfied physicians tended to provide poorer quality patient care (Williams, Manwell, Konrad, & Linzer, 2007). In yet another study of primary care physicians, effects of the working environment were tested to determine impact on quality of care. Even though working conditions were not optimum, and there was physician stress and burnout, they were unable to show a decrease in patient care quality (Linzer et al., 2009). Thus the link between quality of care and physician satisfaction may not be established in a consistent manner.

So we have seen that a number of factors influence physician satisfaction with their work, including, managed care, administrative office detail, declining reimbursement, unhappiness with their community, regulatory changes, lifestyle issues and loss of autonomy. And some or all of these issues have created an environment

where physicians are becoming employees of hospitals and healthcare systems. But even the active trend of hospitals employing physicians, and the physicians becoming employees cannot be construed as a mechanism to improve physician satisfaction. In at least one limited doctoral dissertation study, there was no link found between physician employment and career satisfaction whether they were on a fixed salary or incentive compensation (Heath, 2012).

Physician Practice Organization and Quality

The many forms of physician organizations and quality care have been studied by a Commonwealth Fund Report. This report provided a synthesis of literature on the effects of physician organization types and quality. The emphasis was focused on how physician organization characteristics relate to quality. And three particular characteristics were noted as necessary to meet quality and efficiency standards. Cohesion, scale and affiliation were seen as essential attributes of physician practices that lead to better quality care. The notion of cohesion describes the extent to which physicians practice collaboratively in a group with shared purpose, performance measures, and even finances. Scale relates to a minimum size of a practice which is required to provide the necessary infrastructure of quality care. And affiliation is the characteristic which puts the practice in a larger context with greater resources and capabilities (Tollen, 2008). It is affiliation that would be a driver for physician employment by hospitals in order to provide the resources and infrastructure support for quality care.

Short of employment by hospitals, physicians and hospitals alike are finding themselves in a position to enter into and improve integrated delivery systems. While

payment mechanisms are not fully mature enough to stimulate complete disintegration of existing solo, and multi group independent practices, the momentum is moving in the direction of more widespread integrated delivery systems. Furthermore a number of studies have shown that integrated care is positively correlated with improved quality, which is achieved through the coordination of care among specialties, the effective use of information technology–based decision-support tools, and other key aspects of integrated systems (Crosson, 2009).

But the shift from independent practice to employment by hospitals is not without significant stress and even anger on the part of physicians. Newly employed physicians are being told they have to accept new organization structures; different ways of working, help administration achieve a changing payment model, and perhaps most disliked; corporate driven performance goals. While quality patient care is the goal of physicians, having to adhere to hospital administration requirements is not always embraced. In order for healthcare leadership to help physicians overcome the impediments to medical staff alignment with hospitals goals, there must be a different level of engagement. A level of hospital/physician engagement where there is a shared noble cause, issues to satisfy MD self-interests, a mechanism to earn self-respect, and concepts that embrace tradition (Lee & Cosgrove, 2014).

Achieving a more effective alignment of employed physicians requires a different level of thinking and performance on the part of hospital employers. The ACA has shifted the emphasis related to hospital and physician performance. It is more a matter of outcomes versus the measurement of process. As it relates to the physician, it is about measuring the patient care quality at the level of the organization not the clinician

(Berenson, Pronovost, & Krumholz, 2013). In reality it is the ACA more than any other factor that is driving the need for medical staff/hospital alignment. While the early strategy for employing physicians in the early 1990s and recently may be the quest for more market share, defensive maneuvers, or better managed care negotiating position, the critical emphasis and need now is cost control and demonstrable better patient outcomes. Compensation for physicians within alignment structures will continue to move away from fee for service and volume to fee for value. With the unfolding of bundles and shared payment programs, the measurement of value among physician providers will continue to be a prominent issue (Reiboldt, 2013).

The importance of physician alignment as an essential outcome of physician employment by hospitals cannot be overemphasized in light of widespread healthcare system evolution in the wake of the Affordable Care Act. Lessons from the early 1990s are not apparently well learned, as there is continued stress within a host of hospitals and healthcare systems, (and medical staff members), struggling with the notion of effective alignment and integration of their physician employees. But the motivation for physician employment currently may be driven by different circumstances like the possibility of bundled payments, and the increased expectation of improving quality patient care.

The Emergence of Quality Standards

To help in this transformation to improved healthcare quality, the Joint Commission for the Accreditation of Healthcare Organizations (JCAHCO) promoted quality initiatives such as continuous quality improvement (CQI), and total quality improvement (TQM). The Joint Commission's quality improvement task force suggested that the total quality management movement was the new paradigm in healthcare as early

as 1989. By 1992 the accreditation manual for healthcare outlined new standards that would help hospital leadership move from total quality management to continuous quality management. While the concept of total quality management is the overall goal for healthcare operations, continuous quality management is the process oriented mechanism whereby data is collected, integrated with records management, and quality indicators are created and monitored in an ongoing fashion (Appel, 1991).

Improving quality healthcare is not easy, and becomes more complex and difficult depending on the size of the organization. It is a team approach and must engage a broad array of personnel, top management, physicians, and the Board. In one study involving over 2000 hospitals', quality integration data was merged from a 1989 survey of hospital governance, and a 1993 national survey on hospital quality improvement efforts. Four dimensions of clinical involvement in CQI/TQM were examined: physician participation in formal quality improvement (QI), training, physician participation in QI teams, clinical departments with formally organized quality assurance/quality improvement project teams, and clinical conditions and procedures for which quality of care data are used by formally organized quality project teams. Leadership measures included CEO involvement in CQI/TQM, board quality monitoring, board activity in quality improvement, active-staff physician involvement in governance, and physician-at-large involvement in governance.

The results showed that top management and Board engagement in quality issues had a positive effect on quality. It also showed that active medical staff members involved with governance had a positive effect on clinical quality. However, physicians less active on the medical staff had a negative effect on clinical quality improvement

(Weiner, Shortell, & Alexander, 1997). Thus there is some link between physician engagement and hospital quality initiatives, and in this one study, the level of engagement of physicians in governance (whether active staff or less active), has some influence on patient care quality.

Despite ongoing public and media attention to quality patient care initiatives and various quality standards imposed on the entire healthcare system, physician engagement in quality improvement has been questionable. In fact there is evidence that physicians have resisted full engagement in QI activities. Since the emphasis on quality initiatives began many years ago, physicians have tended to react with skepticism to changes that directly affect the way they practice (Blumenthal & Epstein, 1996).

The extent of physicians' resistance to quality improvement is not well known, but it is the frequent topic of discussion among healthcare management teams. Few data exist to describe the degree of variation, and the factors that might lead to greater buy-in from some groups of physicians. Widespread resistance to the introduction of the electronic medical record (EMR) is commonplace and well known within the industry, even though there are incentives in place, and its adoption is required by changes in Medicare law (Mazzolini, 2013).

The 2003 Commonwealth Fund Survey of Physicians and Quality of Care suggest that as of mid-2003, physicians had not yet fully embraced QI principles and methods. In a 2004 article, Millenson stated that the medical profession's long-standing resistance to embracing QI is unmistakable (Millenson, 2004). Based on the 2003 Commonwealth Fund study, in order to accelerate the pace of quality improvement by physicians, policies

and incentives should focus on three areas: capacity, education, and professionalism (Audet, Doty, Shamasdin, & Schoenbaum, 2005).

Ironically, in 1917 Ernest Codman said, "The science of medicine, however sophisticated it may now be, is always in an experimental stage, we are all in the business of continuous quality improvement" (Codman, 2001, p 72). Thus, it has taken close to a century for this science to diffuse into clinical practice, and the processes are not yet complete (Audet et al., 2005).

Defining Quality More

There is a world wide effort to improve patient care quality, and that of clinical practice. But most quality measurements are poorly validated, expensive to produce, and difficult to compare with other sites (Peabody et al., 2004). Accurate, affordable, and valid measurements of clinical practice are the basis for quality-of-care assessments. However, to date, most measurement tools have relied on incomplete data sources, such as medical records or administrative data, require highly trained and expensive personnel to implement, and are difficult to validate (Green & Wintfeld, 1993). Comparisons of clinical practice across different sites and health care systems are also difficult because they require relatively complex instrument designs or statistical techniques to adjust for variations in case mix among the underlying patient populations.

Quality is defined differently by various parties. In a British publication a simplistic definition was used, that "quality is a concept that describes those features of a product or service to which value is ascribed" (Atkinson, Ingham, Cheshier, & Went, 2010, p 537). The IOM sees quality as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are

consistent with current professional knowledge" (Lohr, 1990). However, in order to define quality in terms of expectations and standards by which quality can be measured, certain "domains" must be created. And there are differing domains that exist according to what group is creating them. For example the IOM listed six fundamental domains of quality: safety, patient experience, effectiveness, efficiency, equity and timeliness. The US Quality Assurance Project goes further, defining nine domains of quality: access, technical performance, effectiveness, efficiency, interpersonal relationships, continuity, safety, choice, and physical infrastructure and comfort. The Royal College of Physicians (RCP) has adopted a definition of quality which comprises patient experience, safety, effectiveness, efficiency, equity, timeliness and sustainability (Atkinson et al., 2010).

But these are broad characteristics that comprise the quality domains. There are more specific indicators to measure, and are those that relate to specific diagnoses, surgical interventions, and inpatient conditions. Until recently, however, we have lacked any national database that could provide analogous data on the quality of care provided by hospitals. Recently, a consortium of organizations, including the CMS, JCAHO, the American Hospital Association, and consumer groups such as the American Association of Retired Persons, initiated an effort now called the Hospital Quality Alliance (HQA) to fill this gap. Under the HQA, hospitals nationwide report data to the CMS on indicators of the quality of care. Acute myocardial infarction, congestive heart failure, and pneumonia have been highlighted and focused on. But again, these are only three indicators of inpatient quality (Jha, Li, Orav, & Epstein, 2005).

The AHRQ has determined a host of quality indicators or measures that fall into two broad categories. Both composite clinical condition indicator lists look at mortality

rates for certain diagnostic conditions (i.e. acute myocardial infarction mortality), and selected procedures (surgical interventions). They are categorized as rates of mortality for selected procedures and mortality rates for selected conditions (AHRQ, 2012). Hospitals across the country use various indicators to track and report quality, but in 2003 the Medicare Modernization Act established financial incentives for hospitals to report quality measures to CMS. This act created 10 indicators for collection. It should be noted that there are 10 indicators, but there are additional measures related to a particular indicator. For example, there are three measures related to myocardial infarction, and two related to pneumonia, and so on. So the landscape of quality measurement is not necessarily uniform from one hospital to another, and only now is there a national data base for analogous measures of performance of hospital quality across America (Jha et al., 2005).

Looking at quality measurement in a more comprehensive sense one finds that physician measures of meeting or not meeting certain specific standards of practice are not adequate when considering overall patient outcomes and hospital performance. Typically data on quality issues come from administrative sources, medical records, and patients' surveys, with information from the medical record comprising the majority of physician performance measurement (Berenson et al., 2013). Only recently has the addition of patient perception of their care become important, secondary to emphasis in the Affordable Care Act and the Consumer Assessment of Healthcare Providers and Systems (CAHPS) surveys.

Other issues with quality measures are the lack of unified sources of the most important quality indicators. Public measure developers such as CMS and AHRQ are

prominent. Nonprofit private developers like the JCAHO and NCQA have their versions. And several professional societies like the American College of Surgeons, and the American Heart Association, and other similar organizations, develop other versions of quality measures. The National Quality Forum (NQF) is perhaps the only singular entity that acts as a clearinghouse for measures submitted to it. The NQF plays an important role in developing consensus standards for quality measures (Berenson et al., 2013).

While so much of the quality measurement in this country is centered on only looking at physician compliance, or process, the greater ideal is to develop quality measurement that reflects the status of patient outcome. And rather than focus on physician compliance with standards, looking at total hospital quality performance is a more comprehensive goal (Berenson et al., 2013).

As the current pace of physicians becoming employees' of hospitals continues, physician engagement in quality reporting and activities will likely increase, particularly if incentive payments become more prominent, and physician salaries are partly tied to it. Medical staff performance clinically will be evaluated in conjunction with patient perception of their care, and this combination of effects will be necessary for truly improved community care.

Enter the Feds…the Government gets Involved

In the early 2000s, the role of the federal government in quality improvement was limited. In 1998 the President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry recommended the creation of the National Quality Forum, a voluntary, public-private partnership that was working primarily on improving measures of quality. The Agency for Healthcare Research and Quality (AHRQ) managed

an active research program in quality of care and patient safety. However, AHRQ's funding represented less than 0.02 percent of national health care spending, and only 0.9 percent of what the federal government spends on medical research through the National Institutes of Health (NIH; Schoenbaum, Audet, & Davis, 2003).

The federal government's involvement with quality issues took a decisive and dramatic turn in 2010 with the passage of the ACA. Among the many components of this landmark act, it seeks to establish a National Strategy for Quality Improvement in Healthcare (the National Quality Strategy). These sweeping healthcare modification plans are intended to improve many problems with the current healthcare system, and many aspects of specific new initiatives involve more intense monitoring of physician behavior and practice characteristics, as they relate to patient care quality. The National Quality Strategy in conjunction with the Department of Health and Human Services (HHS), NIH, and the Federal Drug Administration (FDA), have created new agencies such as the Health Information Technology for Economic and Clinical Health (HITECH), the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), the Patient Centered Outcomes Research Institute (PCORI), along with several other new initiatives like Accountable Care Organizations (ACO) and Medical Homes. Key provisions of the HITECH, HCAHPS, and PCORI programs are the collection of much more data from physicians. And it will have to come from physicians in independent practice and those employed by hospitals (Department for Health and Human Services, 2011). Specifically, physician quality patient care outcomes data will be integral to the success of these government initiatives, and will be reported by employing hospitals and

physicians still in private practice. Furthermore, the provision of the HCAHPS program covers Medicare, Medicaid "and" private insurance patients (CMS, 2013).

So the point of this discourse suggests more and more emphasis on monitoring and reporting the quality of patient care rendered by medical staff members. This will occur because the government wants to determine where the best physician practice quality is, and perhaps reward those institutions who employee the best physicians. There are also penalties imposed by CMS if certain quality data is not collected and reported. As part of its Reporting Hospital Quality Data for Annual Payment Update program, CMS will reduce the annual payment rate by 2% for hospitals that do not participate, or don't meet reporting requirements (Liebhaber, Draper, & Cohen, 2009).

Employed Physician Quality

There is scarce evidence in the literature regarding differences in patient care quality between employed physicians and those still in independent practices. One dissertation done in 2008 looked at quality of care related to coronary artery bypass surgery performed by employed surgeons relative to non-employed surgeons. The conclusion of that study showed that the risk adjusted mortality and cost for hospitals that employed cardiac surgeons was lower than those of hospitals who did not employ their surgeons. The mortality was 22.89% lower ($p = 0.0136$) and costs were 11.86% lower ($p = 0.0691$) at employment group hospitals C, compared to the outcomes at comparison group hospitals (Carlson, 2008). This author believes that because of increasing requirements from the payer sources and other quality agencies, more data will be made available publically on the relationship between hospital employed physicians and their quality of care.

Employment versus Integration

Hospital employment of physicians theoretically can improve quality by encouraging better integration of care and communication among clinicians, but the key concept here is alignment and integration, and clinical integration does not occur automatically once physicians become employees. While the potential of hospital-employed physicians to improve quality and efficiency through better clinical integration across care settings has received much attention, from the hospital perspective, physician employment typically is one of many strategies to gain market share by increasing admissions, diagnostic testing and outpatient services (Felland, Grossman, & Ha, 2011). Clearly physician employment is attractive to both hospitals and physicians while we are still predominantly in a volume-driven fee for service mode. But the growing employment trend does not guarantee that improved clinical integration will occur. The recent acceleration in hospital employment of physicians runs the risk of raising costs and "not" improving quality of care, unless broader payment reform reduces incentives to increase volume. The greatest need is to create incentives for providers to change care delivery in order to achieve real efficiencies and higher quality (O'Malley, Bond, & Berenson, 2011).

A study done in Japan in 2009 looked at hospital employed physicians quality of life with the intent to see if there was a relationship to quality of care for their patients. Disease specific indicators related to the care of patients, as well as disease independent measures of process were abstracted and analyzed against physicians' job satisfaction ratings. Interestingly, there was no significant relationship found between physician job satisfaction and the quality of their patient care. So while it has generally been reported

or assumed that there is a positive relationship between physician satisfaction with their job and quality care, this study did not show any association with patient technical quality of care (Utsugi-Ozaki et al., 2009). Furthermore, a nationwide survey by Merritt Hawkins on behalf of the Physicians Foundation found that 62% of physicians surveyed did not believe provisions contained in the ACA would improve patient care quality or be worth the extra cost involved (Merritt Hawkins, 2012). That same study also illuminated the broad based physician belief that the current state of medical practice is in decline, and that an overwhelming majority are very pessimistic about American healthcare and would retire if they could.

As the provisions of the ACA continue to become implemented, hospitals and healthcare systems will have to find more meaningful ways to integrate and align employed medical staffs. It will be highly important for healthcare leadership to facilitate physician alignment and more meaningful integration of employed physicians. They will have to better understand the nuances of what motivates physicians to improve quality care and be able to support those processes that are clearly quality related.

Theoretical Framework

When considering issues of healthcare quality, the subject becomes fuzzy from the outset because of the general ambiguity of quality, what it is, how to measure it, who is principally responsible for it, and how to effectively improve it. In management, social society, and industry, theories abound that seeks to help us understand how things work (Stinchcombe, 1968). Two theories are applicable depending on whose perspective is taken. From the institution's, the resource based theory is useful. From a particular provider's perspective, such as the physician or nurse caregiver, a primary provider

theory may apply. This study adopts the institution's perspective and uses resource based theory.

Resource Based Theory

The resource based theory of the firm focuses on the competitive advantage of organizations based on the capabilities of the firm or company. The seminal work and research done on resource based theory (RBT) was done by Jay Barney in 1991. The premise of this work describes competitive advantage of companies (i.e., firms) by examining four indicators: value, imitability, rareness, and sustainability (Barney, 1991). Much of the literature on resource based theory involves the strategy of a company to derive a competitive advantage similar to work done by Michael Porter in the 1980s.

Also inherent in much of the writing on resource base theory is the connection to company profits as well as competitive advantage. The key to illuminating resource based strategy for this writing is the concept that a firm's resource includes its personnel and the skills they possess (Grant, 2001). Herein lies the value of this theory because part of the framework of this method is consideration of the actions of hospitals, its myriad tangible resources, the staff, and particularly in this case, its physicians.

The resource-based view of hospitals suggests that organizations differentiate between strategic alliances and acquisition strategies based on an organizations internal resource and the characteristics that may differentiate it from competitors (Yarbrough & Powers, 2008). An Australian study of middle managers evaluated the validity of RBT and its relationship to tangible and intangible assets. Those findings supported the concept of RBT and differentiated relative importance of skills and reputation in contrast to tangible assets. The conclusions drew strong emphasis pointing to an organizations

success as a result of its reputation, organizational skills, and explicit knowledge spread across their human resources, versus tangible assets (Galbreath, 2005).

Hospitals and healthcare systems have been competitive along many dimensions for many many years, and they have achieved competitive status by various means whether attaining greater mass of acquiring the latest technology. In the past few years the quest to gain market share has seen a rush to employ physicians, and that trend has accelerated in an attempt to shore up referral bases and capture admissions, according to the Center for Studying Health System Change's (HSC) 2010 site visits to 12 nationally representative metropolitan communities. Stagnant reimbursement rates, coupled with the rising costs of private practice, and a desire for a better work-life balance have contributed to physician interest in hospital employment. While greater physician alignment with hospitals may improve quality through better clinical integration and care coordination, hospital employment of physicians does not guarantee clinical integration. The trend of hospital- employed physicians also may increase costs through higher hospital and physician commercial insurance payment rates and hospital pressure on employed physicians to order more expensive care (Felland et al., 2011).

To date, hospitals' primary motivation for employing physicians has been to gain market share, typically through lucrative service-line strategies encouraged by a fee-for-service payment system that rewards volume. More recently, hospitals view physician employment as a way to prepare for payment reforms that shift from fee for service to methods that make providers more accountable for the cost and quality of patient care (O'Malley et al., 2011). Therefore, physician employment may or may not be a true

mechanism for gaining a competitive advantage as much as it is a strategy for survival and increasing revenue.

The acquisition of technology has been a core strategy to gain a competitive advantage in keeping with Barneys resource based theory, and hospitals have spent millions trying to one-up the competition. And in at least one study, a positive and significant relationship was found between the acquisition of medical technological innovations and hospital financial performance, and the relationship was found to be strongest when the hospital's medical technologies were simultaneously valuable, worthy of being copied, and rare (Irwin, Hoffman, & Lamont, 1998). Therefore, given the trend of physician employment, the inimitable nature of such strategy must be viewed as a competitive advantage, and would adhere to Barney's theory.

As a very practical advantage, when one hospital employs a limited number of physician specialties within a small geographic area, the competitor hospital(s) then find themselves without the use of those specialist medical staff members. This one aspect of healthcare competition creates a shift in referral patterns, and a host of other market changes. Certainly this could be construed as a competitive advantage and support the precepts of a resource based theory.

CHAPTER 3

METHODS

Research Questions and Hypothesis

Regardless of the reasons why physicians become employees of hospitals, a question remains. Is there any difference in their patient care quality as a result of employment? There have been some empirical publications on the overall state of quality health care in America, issues of physician satisfaction, and the demand for better patient care quality. But given the substantive movement of physicians from independent practice to hospital employment, reliable knowledge that specifically relates to the effect on quality as a result of employment is lacking.

Resource based theory would suggest that there is a sustainable advantage to an organization that has a wealth of resource superior to its competition. RBT suggests that firms with resources that are valuable, inimitable, rare, and sustainable, provide a competitive advantage. Resources come in the form of tangible, intangible, and capabilities. Human resources are tangible resources (e.g. physicians). Capabilities are what individuals can do within the context of the organization. Hiring physicians and providing them with the infrastructure to focus on patient care and quality, should produce good outcomes and give the organization, and the employed physician a competitive advantage. Simply put, hospitals are employing physicians so they can acquire a resource that is valuable, somewhat rare, and cannot be easily replicated and

imitated. By hiring these doctors, they are hoping to establish a permanent relationship, and that would also provide sustainability. When focusing on the employed physician, having access to hospital resources without the hassle of managing an independent office practice, can be a competitive advantage for them.

Certainly a hospital or healthcare system that has a large number of well qualified and diverse medical and surgical physicians within its employment could use this characteristic as a competitive advantage. However, there is credible information that employing physicians is often a costly and money losing endeavor for hospitals (Kocher & Sahni, 2011). Moreover, with so much ACA emphasis on patient care quality improvement, the economic impact both negative and positive, is not the only consideration for hospitals employment of physicians. As discussed earlier, physician alignment that produces measureable increases in patient care quality is a necessary feature of physician employment. But again, empirical examination linking physician employment by hospitals to its strategic advantage as well as improvement in patient quality is not well documented at this time.

So the purpose of this study is to address the following research question:

> RQ1: Is physician employment associated with improvements in quality patient care?

Empirical evidence supports that there is a "race" by hospitals and health systems to employ physicians, and that they have some strategic method in mind (Kocher, Nikhil, & Sahni, 2011). This process is also supported by the resource based theory of the firm. One might speculate that this process generates a question within a question related to the theory. Namely, is there a strategic advantage to the employing entity, and is there a

strategic advantage to the employed physician because they now have access to greater organizational resources?

Hospital employed physicians in this era have contracts with different characteristics and expectations than the 90s (Harbeck, 2011). There is much more emphasis on alignment with the organization and performance expectations that were often absent in the 1990s. Many independent medical practices still do not have the technology to facilitate the EMR. Other technology is found in the hospital setting that can be easily accessed by employed physicians and its use is encouraged. Also, the availability of a host of hospital employees are at the disposal of employed physicians. In general, most employment models create an environment of more physician oversight and employer expectation. Since there are now financial incentives for higher levels of hospital quality, this expectation is prominent, and a more consistent requirement versus what might be expected in independent practice. Furthermore the measurement of employed physician quality performance is done more objectively by hospital staff as opposed to perhaps ones peer or partner in private practice. However, for the purposes of this study, the focus will remain on evaluating the single question; does the employment of physicians affect the quality of their patient care?

In consideration of the resource based theory and the conflicting literature on quality and physician employment, the following hypothesis is presented:

Hypothesis One

Employment of Physicians has a positive effect on the quality of patient care they provide.

H1a: Physician employment results in shorter lengths of stay

H1b: Physician employment results in fewer readmissions within 30 days of discharge

H1c: Physician employment results in lower risk adjusted mortality rates.

Study Population and Data

This is a physician level study whereby employed physicians quality performance will be assessed by looking at 3 indicators used as measures of quality. Those quality measures are ALOS, adjusted mortality rate, and readmissions within 30 days for the same diagnosis. These physicians are employed by an acute care hospital that is a member of a larger healthcare system.

As part of the physician evaluation process, and overall facility quality assurance, numerous quality indicators are collected and analyzed using a proprietary software program that compares actual performance against recognized standards. Medical staff leadership reviews performance data with individual medical staff members on a monthly basis. However for the purpose of this study, indicators will be looked at on a quarterly basis.

While the data reviewed with the physicians is presented in a more generalized dashboard format for the purpose of evaluating physician performance, this study will utilize actual rates of compliance with standardized measures. For example ALOS will focus on the average number of days, (as opposed to higher or lower than expected/benchmark), so that an actual increase or decrease in ALOS can be known. Likewise, physician risk adjusted mortality and readmission rate will be calculated using the actual measures.

To maximize operational data and capture the trend of physician employment over time, data was collected between the winter quarter of 2010 until the summer quarter of 2013. Data will be abstracted and examined on a quarterly basis.

Data Source

Patient quality indicators and physician information were obtained from a prominent general acute care hospital located in Lexington, Kentucky. There are 565 physicians on the active medical staff, and of these, 120 are employed directly by the hospital. Employed physicians are represented by a mix of medical and surgical specialties. This institution enjoys an excellent reputation as a community hospital. Because of its location in the largest city in central Kentucky, there are a significant number of patients that come from the eastern and southeastern counties in the Commonwealth. The hospital has an array of exceptional services and technologies that differentiate it in the region, so it enjoys a market share that comes from a much broader area.

Operationalization of the Variables

Three dependent variables will be used to test the study hypothesis: one, risk adjusted mortality rate, two, average length of stay, and three, readmission within 30 days for the same diagnosis. These indicators were selected because they are relevant across all medical specialties, and they are recognized by all or most of the quality oriented agencies.

The independent variable of primary interest is physician employment. Because the study was interested in examining changes in quality following conversion to employed status, physicians were coded zero during the time periods, (quarters), when

they were independent, and coded one during the time period they became employed by the hospital, and for all subsequent time periods.

Dependent Variables (Quality indicators)

Table 1 constitutes the definitions of the dependent variables or quality indicators.

Table 1

	Definition	**How it's measured**
Average Length of Stay	The number of days a patient stays in a hospital as an inpatient.	ALOS= the number of patient days divided by the total number of patient discharges.
Adjusted Mortality Rate	The number of patients that die while an inpatient; condition, complications, age and other characteristics are considered. It is principally the ratio of deaths to expected deaths.	Mortality rates are calculated by dividing the number of deaths among hospital patients with a specific medical condition or procedure by the total number of patients admitted for that same medical condition or procedure. It is adjusted by incorporating severity of illness factors and age.
Readmission within 30 days for the same diagnosis	Patients that are discharged from an inpatient stay and then readmitted within 30 days with the same diagnosis.	To calculate the readmission rate, one divides the total number of patients readmitted within 30 days by the total number of hospital discharges.

Statistical Test and Analytic Strategy

The study uses fixed effects panel models to test the study hypothesis. Fixed effects panel regression models are used to examine the effects of the independent and control variables on the dependent variables (e.g. ALOS, mortality rate, readmission rate). Fixed effect panel regression models provide a number of advantages over other alternatives for examining these relationships (e.g., repeated measures regression, random effects models). Specifically, the fixed effects regression models allows for an examination of these relationships over time while accounting for potential selection biases. That is, by including physician-level fixed effects, the study accounts for unobserved, time-invariant (or slowly changing) factors that may have acted as confounders by influencing both the independent and dependent variables. For example, a physician's practice style, level of independent behavior, overall stress level, relationship with hospital leadership, and personal sense of compliance may influence how effectively they embrace improvement in quality patient care after employment. In other words, a physician-level fixed effect panel model allows each physician to serve as his/her own control and estimation focused on within physician change over time.

The two key data requirements for the application of a fixed effect model are: (1) each physician in the study must have two or more measurements on the same dependent variable; and (2) for at least some of the physicians in the study, the values of the independent variables of interest must be different on at least two of the measurement occasions. Both of these requirements will be met since (1) the study reviews multiple measurement periods; and (2) physicians in the study possess different levels of the quality measurement at the different observation occasions. By including fixed effects

dummy variables for each quarter of quality observations, the study utilizes repeated measurements of indicators for the same medical staff members over time.

CHAPTER 4

RESULTS

Univariate Analysis

There were 375 physicians evaluated in the study. Fifteen quarters of quality, core measures were examined from 2010 to 2013, for a total of 3,224 physician quarter observations. The number of physicians that were employed within the 375 total increased from 11% in 2010 to 32% in 2013. Of the 3,224 total observations, 2,415 were from independent practice physicians, and 809 were from employed physicians.

Table 2

	Quarterly date															
	101	**102**	**103**	**104**	**111**	**112**	**113**	**114**	**121**	**122**	**123**	**124**	**131**	**132**	**133**	**Total**
0	184	183	184	173	186	151	161	157	156	144	159	158	142	134	143	2415
1	23	28	40	38	39	49	58	61	64	63	63	67	74	73	69	809
Total	207	211	224	211	225	200	219	218	220	207	222	225	216	207	212	3224

Table 3 indicates that there were 105 female physicians and 270 male physicians evaluated in the quality assessment period.

Table 3

Gender				
	Frequency	**%**	**Valid %**	**Cumulative %**
Female	105	28	28	28
Male	270	72	72	100
Total	375	100	100	

Table 4 shows the range of utilization engaging medical and surgical specialties that makes up the 3,224 quality observations. Clearly the hospital provides a lot of care for specialties such as, pediatrics, orthopedic surgery, obstetrics and gynecology, internal medicine, hospitalists, cardiovascular disease, urology, pulmonary medicine, and general surgery.

Table 4

Specialty				
	Frequency	Percent	Valid Percent	Cumulative Percent
Bariatric Surgery	23	.7	.7	.7
Cardiothoracic Surgery	83	2.6	2.6	3.3
Cardiovascular Disease	201	6.2	6.2	9.5
Certified Nurse Midwife (CNM)	36	1.1	1.1	10.6
Colon & Rectal Surgery	68	2.1	2.1	12.7
Dermatology	3	.1	.1	12.8
Emergency Medicine	32	1.0	1.0	13.8
Endocrinology, Diabetes & Met	14	.4	.4	14.3
Family Practice	26	.8	.8	15.1
Gastroenterology	10	.3	.3	15.4

General Surgery	112	3.5	3.5	18.9
Gynecological Oncology	30	.9	.9	19.8
Gynecology	39	1.2	1.2	21.0
Hand Surgery	13	.4	.4	21.4
Hospitalist	280	8.7	8.7	30.1
Infectious Disease	7	.2	.2	30.3
Internal Medicine	184	5.7	5.7	36.0
Laborist	41	1.3	1.3	37.3
Maternal & Fetal Medicine	44	1.4	1.4	38.6
Neonatal-Perinatal Medicine	79	2.5	2.5	41.1
Nephrology	56	1.7	1.7	42.8
Neurology	29	.9	.9	43.7
Neurosurgery	73	2.3	2.3	46.0
Nurse Practitioner	1	.0	.0	46.0
OB Anesthesia	2	.1	.1	46.1
Obstetrics & Gynecology	309	9.6	9.6	55.7
Oncology/Hematology	30	.9	.9	56.6
Ophthalmology	8	.2	.2	56.9
Oral & Maxillofacial Surgery	12	.4	.4	57.2
Orthopedic Surgery	275	8.5	8.5	65.8
Otolaryngology	68	2.1	2.1	67.9
Pain Management	14	.4	.4	68.3
Palliative Medicine	7	.2	.2	68.5

Pathology	10	.3	.3	68.8
Pediatric Allergy/Immunology	1	.0	.0	68.9
Pediatric Cardiology	3	.1	.1	69.0
Pediatrics	610	18.9	18.9	87.9
Plastic/Reconstructive Surgery	51	1.6	1.6	89.5
Pulmonary Medicine	111	3.4	3.4	92.9
Radiation Oncology	6	.2	.2	93.1
Radiology	66	2.0	2.0	95.1
Reproductive Endocrinology	15	.5	.5	95.6
Thoracic Surgery	3	.1	.1	95.7
Urology	124	3.8	3.8	99.5
Vascular Surgery	15	.5	.5	100.0
Total	3224	100.0	100.0	

Only 212 physicians had complete data over the 15 time periods, 69 employed physicians and 143 independent practitioners. Thus the multivariate analysis included only 3,180 physician-quarter observations

The Fixed Effects Regression Model

One of the advantages of using a fixed effects regression model for this type of study is the intent to minimize omitted variable bias. By using a fixed effects test, the across group differences are moderated leaving within group variation which is desirable. Also, outcome data with repeated measurements over an extended period of time, further points to fixed effects as an appropriate statistical test.

Fourteen quarters of physician employment dummy variables were created and used as covariates.

A regression model was conducted for dependent variables. The general form of these models was as follows.

The Equation

The equation for the fixed effects model is: $Yit = \beta 1 Xit + \alpha i + uit$; where αi (i=1….n) is the unknown intercept for each entity (n entity-specific intercepts), Yit is the dependent variable (DV; i.e., ALOS, Mort, Readmits) where i = entity(physician) and t = time, (15 quarters of measured quality indicators), Xit represents one independent variable (IV; i.e., physician employment, $\beta 1$ is the coefficient for that IV, and $u$it is the error term.

The principle insight is that if the unobserved variable does not change over time, then any changes in the dependent variable must be due to influences other than these fixed characteristics, or in this case the employed doctors (Source: Panel Data Analysis, Fixed and Random Effects, Using STATA, Princeton University).

Statistical Results

The effect of employment on average length of stay, (ALOS) was nonsignificant, (b = -.273, p = 0.517) Value for t = -0.65 which is < 1.96, is nonsignificant, and does not show any influence of the predictor variable x1 on y, the dependent variable. The value for R^2 = 0.000 and probability > F value for employment was 0.65. There was one significant value seen in one quarterly measurement, but is not reportable. These statistics were abstracted from Appendix A.

The effects of employment on mortality rates was nonsignificant ($b = 0.64$, $p = 0.189$). Value for $t = 1.31$, which is < 1.96, is nonsignificant, and does not show any influence of the predictor variable on the dependent variable. The value for $R^2 = 0.05$, and the probability > F value for employment was 0.012. There was one significant value in one of the quarterly measurements, but is not reportable. These statistics were abstracted from Appendix B.

The effects of employment on readmission rates was nonsignificant, ($b = -.283$, $p = 0.754$). Value for $t = -0.31$ which is < 1.96, is nonsignificant, and does not show any influence of the predictor variable on the dependent variable. The value for $R^2 = 0.00$, and the probability >F value for employment was 0.581. There was no significance seen in any of the quarterly measurements. These data were abstracted from Appendix C.

Hypothesis Testing

The hypothesis and premise of this dissertation is that employment of physicians by hospitals has a positive effect on quality patient care. The findings of this analysis did not support this hypothesis, with physician employment not significantly associated with quality patient care for any of the three dependent variables.

There were some quarters of observations that showed significant effects related to the base quarter (winter). When observing the effects of employment on ALOS, there was significance in the 11th quarter, (summer of 2010), where there was an increase in ALOS. When observing the effects of employment on mortality rates, there was significance found in quarter three, (summer of 2010), and marginal significance found in quarters five and 13. These findings mean that for those observations, in those specific quarters, there was a relationship between the base quarter, (winter) and other quarters.

However it only means that the significance represents an increase in mortality and it was greater compared to the first quarter, (winter), base period.

CHAPTER 5

SUMMARY AND CONCLUSION

With the prevalence of hospitals employing physicians, the effects of that process on the quality of patient care seems to be a relevant point of study. Current literature suggest employment rates are still growing, however there is predicted to be some pullback because of mounting financial losses to employing hospitals (Kutscher, 2014). Still the primary reason for hospitals employing physicians is to increase market share and to prepare for market reform and reimbursement changes (O'Malley et al., 2011). What is still vague and not well documented, is the effects on quality of these employment trends. There still isn't much literature to suggest that patient care is improved system wide, namely because of the lack of true physician integration into hospital patient care culture. Given the apparent knowledge that physicians in America are generally disillusioned with the current process of healthcare, attempts on behalf of employing hospitals to buoy up physician efforts to improve quality may be a daunting task.

The results of this study do not support a significant relationship between patient care quality and employed physicians', even over a three year period. With the aforementioned literature on poor or effective employed physician integration, financial losses from employed physicians, and the general lack of improved quality supported in this analysis, it causes one to question how sustainable current employment strategies are.

Conclusions and Implications for Management

Even though there was no significant statistical evidence that physician employment effects patient care quality demonstrated in this study, some values were found to be influential. However, they were only associated with two quarterly measurement periods, summer of 2010 and 2012, compared to the base winter period.

Further analysis would have to be done engaging hospital staff and noting seasonal and/or epidemiological trends over the course of the observation periods in order to more fully understand the relationships of trends related to quarterly measurements.

For hospital and healthcare leaders the long term continuation of physician employment is perhaps a questionable practice. This study focused on a relationship between patient care quality and employed physicians, and a significant relationship was not detected. Some cited literature discussed issues of insufficient employed physician integration and alignment. Other articles characterized the financial burden of employing physicians. Notwithstanding the overarching strategy to control larger market shares and facilitate provider integration, hospitals that employ physicians may have to rethink this strategy. In fact, over the three year period of quality measurement, the hospital where these data came from had discharged some of its physicians. With documented financial losses associated with employed physicians, many hospitals will not be able to continue their employment over the next few critical years of the Affordable Care Act implementation. This will become particularly more probable in light of the failures of hospitals and systems to achieve all or most of the goals of their original employment strategies.

Perhaps it is still too early to expect more patient care quality from employed physicians. But as the reimbursement incentives precisely related to measured quality care become more burdensome, it will increase the pressure on hospitals and physicians to show a demonstrable quality patient care. In 2015 there will be additional metrics added to the value based purchasing requirements. The efficiency measures, (worth 20% of the evaluation process), will require measurement of Medicare cost per beneficiary. So it is the first time this process is focusing on cost versus just clinical process, patient experience, and outcomes of care.

In order for management teams to effectively comply with these new VBP requirements, they will have to dedicate more accurate effort to understand what the true cost of care is for treating all patients, not just Medicare. This process will put even more pressure on leadership and management teams to improve their alignment. From the point of view of the physician, there is an ethical and morale incentive for them to render high quality care, and this author believes most physicians want to do this. But it will require healthcare leadership to discover new, more innovative and successful means to achieve it.

Successful leaders in the near future will have to do more than contribute marketing rhetoric to their quality process. They will be required to clearly define their organizations definition of quality, make sure it is commensurate with broad acceptable standards, and then monitor their scope of authority to ensure that those standards are being met on a patient by patient basis. Over the past five years there has been a growing emphasis on quality patient care and quality standard reporting. The whole transparency movement relating to quality reporting has been a relatively consistent focus of literature

and additional requirements. Now the ACA has introduced a defined link between quality and financial reimbursement. These processes, along with other quality monitoring programs, stipulate monetary rewards and penalties for quality care. And it is likely that these rewards and penalties will have a significant impact on the nation's healthcare facilities over time.

Limitations of the Study

Clearly the size and scope of this analysis is a limitation. While there were 3,224 observations of repeated measure done over a 15 quarter period, the sample of physicians (n = 375), and 212 with complete 15 quarter data, it was only one facility, in one part of the Southeast part of the United States. Furthermore, the process of selection for these employed physicians was not researched, and it is not known what criteria were used to hire them. As part of the value based purchasing process, there are 12 core clinical measures to monitor, and this study only used three as its dependent variables. However, the dependent variables of average length of stay, mortality rate, and readmission for the same diagnosis within 30 days of original discharge, are variables that apply to all medical staff members regardless of specialty. While not exclusive, these variables are arguably a few of the most critical patient care quality indicators.

There were fewer observations per quarter than the total number of medical staff members represented in the group. Much of this can be explained by the fact that not all the active medical staff members of the facility attend every patient of do procedures on them. Therefore there is the appearance of missing data, but perhaps more accurately there are not quality data reported on physicians that did not attend or do procedures on patients during the study period. This could be construed as a serious limitation because

it tends to concentrate the quality measurements in fewer physicians rather than the whole active staff. This phenomena could mask the within group variability and renders the fixed effects model less predictive.

In keeping with much of the available literature describing the strategy for employing physicians, it is believed that a more prominent motivation for hiring physicians at this data source was to enhance and protect market share rather than to improve quality care. This strategy could be construed as a weakness.

With reference to economic reasons for hospitals employing physicians, this study did not evaluate any financial parameters associated with physician employment. The issue relates to both the hospitals financial implications, and the physicians. It was noted earlier that there are serious concerns about hospital financial losses from employed physicians, but this study did not delve into those losses or the benefits to physicians as employees versus independent practice.

While there were quarterly dummies created as a time line, creating seasonal dummies alone may have given more reliable data on the effects of individual seasons on patient care quality.

Recommendations for Further Study

Broadening the study to include larger samples from more than one facility would yield greater depth of confidence in making accurate judgments' about the effects of physician employment on quality patient care, particularly where a greater number of the active staff actually attend their patients. Even an analysis of similar studies done in disparate regions would be a valuable comparison so that it would validate a more global perspective of employment effects on quality.

The addition of at least two more dependent variables would be beneficial. For example, adding hospital acquired infections would be another core measure that would apply to most physicians treating inpatients. Perhaps even adding discharge disposition may be useful. While not a true core clinical measure, it most certainly relates to quality, in as much as it is an indicator of how effective the medical staff was in restoring health to an independent level. Also, it is a focus of provisions in the ACA, and its attempt to stimulate a more comprehensive hospital responsibility for managing patient well-being beyond the acute care phase.

Finally, I think a similar study that would include the economic impact of physician employment might be useful. Particularly, a study that would attempt to discern the actual cost of quality care as provided by employed physicians, not just the direct and indirect cost of physician employment. One would first have to establish the parameters and acceptable definition of quality care and then associate a cost with it as compared to those patients care that fall outside the quality parameters.

Closely associated with true cost of quality is the need for hospitals to develop benchmark criteria for what effective physician alignment is, make certain that it encompasses quality metrics, and then equate a cost to physician alignment and quality care.

Summary

Current healthcare leadership in the United States is aware of the prevalence of physician employment, and literature going back many years has chronicled the movement. And while there may be a slowing of such practices, the process continues. It has also been fairly well documented that the reasons for hospitals employing

physicians is not necessarily for improving the quality of patient care, but rather, to gain market share, improve reimbursement contracting, and prepare for regulatory changes underway. Despite the emphasis and demand for improved patient care quality contained in the ACA, little information exists to demonstrate a positive relationship between employed physicians and quality patient care.

Hospitals have spent tens of millions of dollars in the quest to employ physicians for many reasons cited in this document and readily available in the healthcare literature. Despite this nationwide phenomena, there is evidence that employing physicians does not guarantee that there is an effective alignment or integration that leads to demonstrable improved patient outcomes and quality. Employment is a mere vehicle and not a stand-alone mechanism for patient care quality. Thus true alignment of employed physicians will continue to be a vital requirement in order to achieve better patient quality outcomes, improved community health, and cost containment.

This study was undertaken to ascertain whether or not there was a relationship between employed physicians and their quality of care over a 15 quarter period in one successful and highly respected Kentucky general acute care hospital. Utilizing a fixed effect regression statistical model and three generally used variables to indicate quality patient care, the analysis did not produce significant evidence that the employed physicians in this setting had improved patient care quality, or that there was a relationship between employment and quality care.

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Appendix A

Fixed Effects Panel Output using Stata, A

```
. xi: xtreg  AVERAGE_LOS  Employement_status  spec Gen i.Quarterly_date, i( phys
> ician) fe
i.Quarterly_d~e   _IQuarterly_101-133 (naturally coded; _IQuarterly_101 omitted)
note: spec omitted because of collinearity
note: Gen omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =      3224
Group variable: physician                       Number of groups   =       375

R-sq:  within  = 0.0044                         Obs per group: min =         1
       between = 0.0024                                        avg =       8.6
       overall = 0.0000                                        max =        15

                                                F(15,2834)         =      0.83
corr(u_i, Xb)  = -0.1035                        Prob > F           =    0.6470
```

AVERAGE_LOS	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Employement~s	-.2736344	.4223177	-0.65	0.517	-1.101716	.5544467
spec	0	(omitted)				
Gen	0	(omitted)				
_IQuarter~102	.4034203	.3625044	1.11	0.266	-.3073788	1.114219
_IQuarter~103	.135255	.3607795	0.37	0.708	-.5721619	.8426719
_IQuarter~104	.3882212	.3665977	1.06	0.290	-.330604	1.107047
_IQuarter~111	.4542525	.362325	1.25	0.210	-.2561949	1.1647
_IQuarter~112	.020157	.3740729	0.05	0.957	-.7133258	.7536397
_IQuarter~113	.1672347	.3679073	0.45	0.649	-.5541584	.8886278
_IQuarter~114	.0377627	.3705699	0.10	0.919	-.6888513	.7643766
_IQuarter~121	.1978948	.3703362	0.53	0.593	-.528261	.9240506
_IQuarter~122	-.0155039	.3746488	-0.04	0.967	-.7501159	.7191081
_IQuarter~123	.7972451	.3702585	2.15	0.031	.0712416	1.523249
_IQuarter~124	.30008	.3712811	0.81	0.419	-.4279286	1.028089
_IQuarter~131	.3428303	.3770826	0.91	0.363	-.3965539	1.082214
_IQuarter~132	.3080121	.3798316	0.81	0.417	-.4367623	1.052787
_IQuarter~133	-.082969	.3794906	-0.22	0.827	-.8270747	.6611367
_cons	4.340421	.2698696	16.08	0.000	3.81126	4.869582
sigma_u	3.1674606					
sigma_e	3.631781					
rho	.43202697	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(374, 2834) =     4.15           Prob > F = 0.0000
```

Appendix B

Fixed Effects Panel Output using Stata, B

```
. xi: xtreg  MORTA_rate Employement_status  spec Gen i.Quarterly_date, i( physician) fe
i.Quarterly_d~e   _IQuarterly_101-133 (naturally coded; _IQuarterly_101 omitted)
note: spec omitted because of collinearity
note: Gen omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =      3224
Group variable: physician                       Number of groups   =       375

R-sq:  within  = 0.0105                         Obs per group: min =         1
       between = 0.0910                                        avg =       8.6
       overall = 0.0501                                        max =        15

                                                F(15,2834)         =      2.00
corr(u_i, Xb)  = 0.2008                         Prob > F           =    0.0121
```

MORTA_rate	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Employement_status	.6441722	.4903105	1.31	0.189	-.3172293	1.605574
spec	0	(omitted)				
Gen	0	(omitted)				
_IQuarterly_102	.2296071	.4208673	0.55	0.585	-.5956301	1.054844
_IQuarterly_103	1.073605	.4188646	2.56	0.010	.2522947	1.894915
_IQuarterly_104	.2960377	.4256196	0.70	0.487	-.5385178	1.130593
_IQuarterly_111	.7329194	.420659	1.74	0.082	-.0919094	1.557748
_IQuarterly_112	.1623304	.4342984	0.37	0.709	-.6892424	1.013903
_IQuarterly_113	.1569131	.42714	0.37	0.713	-.6806236	.9944499
_IQuarterly_114	.5771615	.4302313	1.34	0.180	-.2664367	1.42076
_IQuarterly_121	-.083693	.42996	-0.19	0.846	-.9267592	.7593732
_IQuarterly_122	.3081309	.434967	0.71	0.479	-.544753	1.161015
_IQuarterly_123	-.0416227	.4298699	-0.10	0.923	-.8845122	.8012667
_IQuarterly_124	-.1493851	.4310571	-0.35	0.729	-.9946024	.6958323
_IQuarterly_131	.8106187	.4377926	1.85	0.064	-.0478057	1.669043
_IQuarterly_132	-.2857212	.4409842	-0.65	0.517	-1.150404	.5789612
_IQuarterly_133	-.4816751	.4405883	-1.09	0.274	-1.345581	.382231
_cons	1.469753	.3133183	4.69	0.000	.8553984	2.084108
sigma_u	3.295486					
sigma_e	4.2164946					
rho	.37921042	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(374, 2834) =     5.70           Prob > F = 0.0000
```

Appendix C

Fixed Effects Panel Output using Stata, C

```
. xi: xtreg  READMISSIONS_rate  Employement_status  spec Gen i.Quarterly_date, i( physician) fe
i.Quarterly_d~e   _IQuarterly_101-133 (naturally coded; _IQuarterly_101 omitted)
note: spec omitted because of collinearity
note: Gen omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =      3224
Group variable: physician                       Number of groups   =       375

R-sq:  within  = 0.0047                         Obs per group: min =         1
       between = 0.0127                                        avg =       8.6
       overall = 0.0005                                        max =        15

                                                F(15,2834)         =      0.88
corr(u_i, Xb)  = -0.0779                        Prob > F           =    0.5817
```

READMISSIONS_rate	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Employement_status	-.2832102	.9041633	-0.31	0.754	-2.056095	1.489675
spec	0	(omitted)				
Gen	0	(omitted)				
_IQuarterly_102	.6764925	.7761057	0.87	0.383	-.8452967	2.198282
_IQuarterly_103	1.08588	.7724127	1.41	0.160	-.4286678	2.600428
_IQuarterly_104	-.0419426	.7848693	-0.05	0.957	-1.580915	1.49703
_IQuarterly_111	.5976928	.7757217	0.77	0.441	-.9233433	2.118729
_IQuarterly_112	.2331221	.8008735	0.29	0.771	-1.337232	1.803476
_IQuarterly_113	.2626437	.787673	0.33	0.739	-1.281827	1.807114
_IQuarterly_114	-.4167875	.7933735	-0.53	0.599	-1.972436	1.13886
_IQuarterly_121	1.132221	.7928733	1.43	0.153	-.4224464	2.686888
_IQuarterly_122	.4841808	.8021064	0.60	0.546	-1.088591	2.056952
_IQuarterly_123	-.3580813	.792707	-0.45	0.652	-1.912422	1.19626
_IQuarterly_124	.5753576	.7948964	0.72	0.469	-.9832763	2.133991
_IQuarterly_131	1.20837	.8073171	1.50	0.135	-.3746182	2.791359
_IQuarterly_132	-.1752382	.8132026	-0.22	0.829	-1.769767	1.419291
_IQuarterly_133	.2083678	.8124724	0.26	0.798	-1.384729	1.801465
_cons	3.080485	.5777787	5.33	0.000	1.947575	4.213394
sigma_u	5.0562545					
sigma_e	7.775481					
rho	.29719339	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(374, 2834) =     2.18           Prob > F = 0.0000
```