

Is Value-Based Purchasing the New Reality in Healthcare?

Jeffrey P. Harrison, Ph.D., MBA, MHA, FACHE
Professor and Chair, Department of Public Health
University of North Florida,
Jacksonville, Florida

Debra A. Harrison, DNP, RN, NEA-BC
Vice President, Clinical Data Analytics, AMR

Robert Howey, MBA, MHA, CPA
Revenue Cycle Manager, Mayo Clinic
Jacksonville, Florida

Raymond Walters, BHA, University of North Florida,
Jacksonville, Florida

ABSTRACT

While past studies have analyzed hospital Quality to evaluate organizational performance, this study is unique because it evaluates the relationship between healthcare Efficiency and Quality to create Value. The Hospital Total Performance Score (TPS) is the Medicare surrogate for healthcare Value. In 2017, TPS will represent five domains including Process of Care, Patient Experience, Safety of Care, Outcomes and Efficiency. This article provides an innovative approach to measuring healthcare Value as the federal government attempts to realign scarce healthcare resources to reward individual hospitals for best meeting local community needs.

This research study uses data from CMS to assess the projected impact of the Value-Based Purchasing program on 2,955 eligible U.S. hospitals in FY2017. The data show that Value-Based Purchasing payments are projected to increase from \$1.5 billion in FY2016 to \$1.8 billion in FY2017. This study found that teaching hospitals and hospitals in urban areas may be at greater risk for reduced funding under the Value-Based Purchasing program.

These results have managerial implications related to improving hospital quality and enhancing organizational performance. The study has policy implications on current initiatives related to pay-for-performance in the healthcare industry. It also supports the premise that hospital leadership through the effective allocation of resources, the development of high performance work processes and a commitment to Quality can improve healthcare Value.

Key words: Hospital Value-Based Purchasing, hospital quality, hospital pay for performance.

INTRODUCTION

The United States has been fighting an uphill battle for years over an affordable healthcare system that provides consumers with high quality and valued services. According to the Commonwealth Fund (2015a), the U.S. stands out for having the highest per capita healthcare spending at \$9,086 in 2013, ranking highest out of 13 other countries, with the UK ranking lowest at \$3,364 per person. Not only does the U.S. fare worse in per capita spending but also in quality metrics such as infant mortality and life expectancy as compared to other developed nations. The U.S. also tops the list for deaths that are considered preventable with timely and appropriate treatment. Unlike other developed nations such as Germany and Japan, a hospital stay or simple diagnostic test such as an MRI cost a hefty price in the United States. As a result, public spending on healthcare in the U.S. equaled \$4,197 per capita, higher than all but Norway and the Netherlands despite being the only country on the list without a universal healthcare system. These high costs place a heavy burden on government, which funds Medicare, Medicaid, and other public insurance programs; on employers, who help pay for the health coverage of workers and their families; and on American households, who feel the pain in their pocketbooks, through higher taxes and reduced wages (Commonwealth Fund, 2015a).

In today's healthcare setting, the Affordable Care Act of 2010 has provided insurance for millions of Americans, significantly increasing access to care, but does it address the underlying market failures? With healthcare changing under reform, it can be difficult for hospital and health system executives to pinpoint what to focus on strategically to achieve the best quality of care. This paper provides a general idea of some recent innovations designed to bring accountability to healthcare.

This study is unique because it evaluates the impact of the CMS Total Performance Score (TPS) on hospital payments through Value-Based Purchasing. U.S. hospitals are increasingly under financial pressure because they lack the capital required to meet ongoing operational requirements as well as replace aging facilities and invest in new technologies. Additionally, quality improvement can require substantial upfront investment to engage in these initiatives so hospitals must have strong financial performance (Nguyen, Halm, & Makam, 2016). Responding to these issues and the requirement for quality healthcare services within these communities is a factor of local community concern as well as regional and national health policy. Since this study uses TPS

scores to focus on hospital quality, it will allow the benchmarking of individual hospitals against industry standards.

LITERATURE REVIEW

It seems intuitive that physicians', hospitals', and payers' incentives be aligned around quality rather than quantity. However, these groups are often incentivized to maximize their profit which, in turn, increases the use of resources. These current quantity-based compensation systems reward physicians more for seeing additional patients than for taking the additional time necessary to provide better care. More recently, pay-for-performance programs have been introduced in an attempt to create incentives for Value of care within the market-based system. These metrics were included in the Affordable Care Act (ACA) of 2010 as starting points for transitioning to a value-based payment system. Within the Centers for Medicare & Medicaid Services (CMS), three pay-for-performance programs were developed including the Value-Based Purchasing (VBP) program, the Hospital Readmissions Reduction Program (HRRP), and the Hospital-Acquired Conditions (HAC) program. These three programs are designed to transition hospitals to more value-based reimbursement by using Medicare withhold money to penalize or reward providers based on their performance on certain quality metrics. From CMS's perspective, the VBP program is budget neutral because it uses the hospitals' reimbursement withhold to create the incentive money for higher performance.

As noted in Figure 1 below, the CMS withhold for Value-Based Purchasing has been increasing at a significant rate. In 2016, the amount withheld was a 1.75% reduction from participating hospitals' base operating diagnosis-related group. This withhold rate increased to 2% in FY 2017.

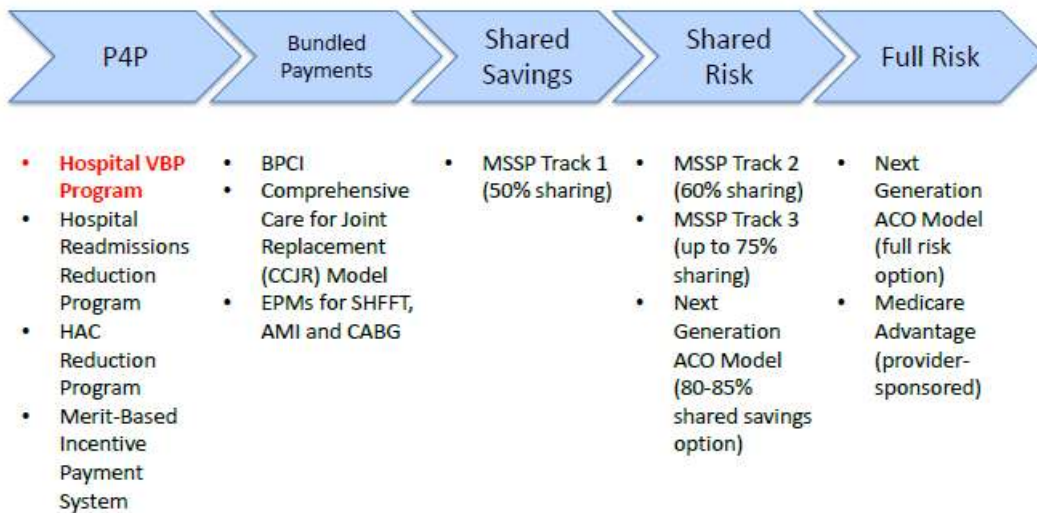
Figure 1: Value-Based Purchasing Withhold Rate by Year

Federal Fiscal Year	Withhold
2013	1.00%
2014	1.25%
2015	1.50%
2016	1.75%
2017 and after	2.00%

Source: Centers for Medicare & Medicaid Services

In FY 2016, the resulting amount was close to \$1.5 billion (CMS, 2015). In FY 2017, the amount withheld will be \$1.8 billion. This money is then redistributed to hospitals that have met the CMS TPS performance metrics. Hospitals that perform well in pay-for-performance metrics will receive a payment that is more than the amount withheld. As noted in Figure 2 below, CMS will continue to look for innovative approaches that will reduce cost while increasing healthcare quality and value.

Figure 2 – CMS Movement toward Greater Performance Risk



Source: Adapted from Centers for Medicare & Medicaid Services

HRRP and HAC programs are strictly penalty programs. HRRP issues a penalty of up to 3% for hospitals with excessive avoidable readmissions, and HAC issues a 1% penalty for hospitals whose performance is in the bottom quartile for hospital acquired infections (Bosko, Dubow, & Koenig, 2015). Faced with these new reimbursement programs, healthcare executives need to take the necessary steps to improve performance and overall quality of care across their organization.

Bundled payments will be the next priority for Medicare and Medicaid payment models. According to Blumenthal and Squires (2016), a bundled payment is a single payment for all services within an episode of care including inpatient, outpatient and rehabilitation care associated with the procedure. Bundled payments have been used for hip and knee surgery and cardiac surgery. The intent is to create an incentive to decrease cost and therefore save money within the bundled procedure. While bundles can work for procedures done on patients with few co-morbidities, they become more challenging when, for instance, a hip patient has diabetes or asthma.

McCarthy, Mueller, and Wrenn (2009) found Geisinger Health System in Pennsylvania was successful in using bundled payments to physicians for coronary artery bypass surgery as well as for angioplasty, maternity care, and bariatric surgery procedures. The case study focused on bypass surgery, requiring all surgeons from Geisinger owned hospitals to complete 40 critical patient-care steps to reduce medical errors and complications. The study provided incentives based on how well the physicians met these steps. The study found that, over a five-year period, Geisinger Health System had the following success: the 30-day hospital readmission rate for bypass patients dropped 44%, in-hospital mortality decreased 67%, wound infections fell 76%, and all complications declined 10%.

The literature is mixed about the relationship between hospital quality improvement and overall hospital financial performance. In a study conducted by three physicians and partially funded by the Agency for Healthcare Research and Quality (AHRQ), they found no consistent relationship between hospital financial performance and subsequent publicly reported outcomes for Acute Myocardial Infarction (AMI) and pneumonia (PNA). Conversely, they found no association between low 30-day mortality and readmissions rates and subsequent financial performance, suggesting that improved outcomes do not necessarily lead to improved revenue (Nguyen, Halm, & Makam, 2016). As a result, more research is needed to determine the impact of incentive pay and penalties on hospital quality and financial performance.

THEORETICAL FOUNDATION

Transaction Cost Economics (TCE) emphasizes the importance of minimizing transaction costs in order

to achieve organizational goals and assure its survival. Transaction Cost Economic theory can also be an effective strategy in the healthcare industry as organizations attempt to improve the value of their healthcare services. According to Stiles, Mick, & Wise (2001), healthcare is comprised of complex sequences of transactions among patients and providers. These transactions include the coordination of care among providers as well as the provision of the healthcare services. Because coordinating transactions is integral to healthcare delivery, it is imperative that they are executed smoothly and efficiently. Transaction Cost Economics provides a conceptual framework for analyzing healthcare transactions and quantifying their impact on healthcare organizational structures as they strive to improve processes and clinical outcomes. Since these transactions occur across healthcare markets, we believe integrated delivery systems may be an effective approach to adopt in the evolving healthcare industry.

Administrative transaction costs in the U.S. healthcare system consume an estimated \$361 billion annually. This accounts for 14 percent of all healthcare expenditures in our nation. Research suggests that a significant portion of this spending is considered wasteful. According to Wikler, Basch, and Cutler (2012) in a time of large budget deficits, reducing administrative costs is an opportunity to lower healthcare costs while improving patient care. This leads to the question of what is being done in our current health system to decrease costs and improve performance.

An efficient organization uses contractual relationships to minimize transaction costs (Hayen et al., 2013). To minimize these transaction costs, it is important to reduce opportunistic behaviors and design healthcare systems which are synergistic and function effectively in the evolving healthcare industry. From our perspective, a hierarchical organizational structure supports TCE because it provides contractual relationships which span across the continuum of healthcare services.

TCE recommends two different methods of forming a contractual relationship: the price system and hierarchy. For instance, when an Accountable Care Organization (ACO) opts for the price system, its healthcare providers remain independent but participate in a virtual network. The ACO will go by market prices when determining a provider's value and reimbursements are based on each provider's output valued at market prices (Hayen et al., 2013). This contrasts with a hierarchical structure where the healthcare providers create a new organization and transfer their right to make decisions to the ACO's management in exchange for receiving an income independent of volume.

Faced with increasing transaction costs, many hospitals may lack the resources to adopt a comprehensive patient safety strategy. For example, a hospital may lack the professional staff, the computer hardware and the data systems necessary to develop a robust patient safety program. Futrell (2013) believes TCE is an effective strategy to improve performance and reduce costs by leveraging technology to care for populations in a proactive and patient-interactive manner. Future success under healthcare reform will require health information technology to deliver real time disease specific data to support interoperability across clinical data systems.

Patient safety is a significant problem in our nation's hospitals. The hospital industry is aware that proactive action to correct and prevent these problems is necessary to provide the level of care that patients deserve. Preventable errors such as adverse drug reactions, child birth complications, infections at surgical sites and pressure ulcers account for millions of injuries, resulting in billions of dollars in unnecessary healthcare expenditures.

Total Performance Score

The Total Performance Score (TPS) is the CMS surrogate for Value and includes five domains: Process of Care, Patient Experience, Safety of Care, Outcomes and Efficiency (see Figure 3). It is important to note that Process of Care has been decreasing in weight for the TPS. Many hospitals have learned to achieve high scores (often 100%) on process measures so the CMS focus has changed to outcomes and safety. Beginning in 2017, Process of Care accounts for only 5% of the TPS and includes 3 clinical areas of focus: acute MI, preventive care (i.e. influenza vaccine) and Maternal Health (i.e. Elective Delivery prior to 39 weeks gestation). Patient Experience is composed of the 8 dimensions from the HCAHPS survey and accounts for 25% of the hospital's

TPS. The Outcome domain contains 3 mortality measures for Acute Myocardial Infarction, Heart Failure and Pneumonia. This domain accounts for 25% of a hospital’s TPS. The Efficiency domain contains one measure – Medicare Spending per Beneficiary (MSPB) and accounts for 25% of a hospital’s TPS. A new domain in 2017, the Safety of Care includes measures related to Hospital Acquired Infections including Catheter Associated Urinary Tract Infections (CAUTI), Central Line Associated Blood Stream Infections (CLABSI), C-difficile Infections (CDI), Methicillin-resistant Staphylococcus aureus (MRSA) and Surgical Site Infections (SSI) along with the AHRQ PSI-90 composite. This domain will provide 20% of the TPS.

Figure 3 – CMS Domains for Total Performance Score

Domains	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Process of Care	70%	45%	20%	10%	5%
Outcomes		25%	30%	40%	25%
Safety of Care					20%
Patient Experience	30%	30%	30%	25%	25%
Efficiency			20%	25%	25%
Total	100%	100%	100%	100%	100%

Source: Adapted from Centers for Medicare & Medicaid Services

RESEARCH QUESTIONS

This study evaluates the impact of Value-Based Purchasing (VBP) on U.S. hospitals. The research question guiding this study is as follows: What are the key domains affecting the Medicare Total Performance Score and how does TPS affect financial payments under Value-Based Purchasing? The following additional research questions were proposed:

- What is the anticipated impact of the VBP program on inpatient revenue by teaching versus non-teaching hospital?
- What is the potential impact of the VBP program on inpatient revenue by rural versus urban hospital?
- What is the anticipated impact of the VBP program on inpatient revenue by the geographic region of the hospital?
- Which groups of hospitals are more efficiently managed and are generating more financial revenue through Value-Based Purchasing?

DATA AND METHODOLOGY

We examined 2,955 U.S. Hospitals eligible for the VBP program for federal fiscal year 2017. Data was obtained from publicly available files on the Centers for Medicare & Medicaid Services (CMS) website. The data files provided extensive organizational data including ownership type, bed size, wage index, case mix index, VBP payment factors, and geographic location for each hospital. The projected net gains or losses in the tables were calculated by taking the difference between the hospital's contribution (2% of inpatient operating payments) and the amount earned under VBP based upon the hospital's total performance score (TPS).

RESULTS

Table 1 uses TPS and Hospital Medicare Patient Revenue to demonstrate the Financial Impact of Value-Based Purchasing by Hospital Type. In particular, the table compares Teaching versus Non-Teaching Hospitals. For 2017, non-teaching hospitals will fare positively under VBP with an aggregate \$40.5M increase (0.12%) in its inpatient operating payments while teaching hospitals will see an aggregate \$45.3M decrease (-0.09%). In addition, hospitals located in rural areas and large urban areas (population > 1 million) are projected to fare positively under VBP with an aggregate increase of \$18.9M (0.26%) and \$2.5M (0.01%) respectively. Hospitals located in non-urban areas are projected to see a decrease in inpatient operating payments of \$26.2M (0.07%). This table demonstrates the shifting of payments from teaching to non-teaching and other urban to rural/large urban based upon hospitals' TPS scores.

Table 1: The Financial Impact of Value-Based Purchasing by Hospital Type

Teaching Status	n	Gain/ (Loss)	Total Operating Payment	% Gain/ (Loss)
Non-Teaching	1,925	40,529,716	34,267,395,288	0.12%
Teaching	1,030	(45,301,984)	49,458,221,572	-0.09%
Grand Total	2,955	(4,772,268)	83,725,616,860	

Urban/Rural Status	n	Gain/ (Loss)	Total Operating Payment	% Gain/ (Loss)
Rural	680	18,926,482	7,196,920,851	0.26%
Other Urban	1,048	(26,204,892)	35,034,278,264	-0.07%
Large Urban	1,227	2,506,143	41,494,417,745	0.01%
Grand Total	2,955	(4,772,268)	83,725,616,860	

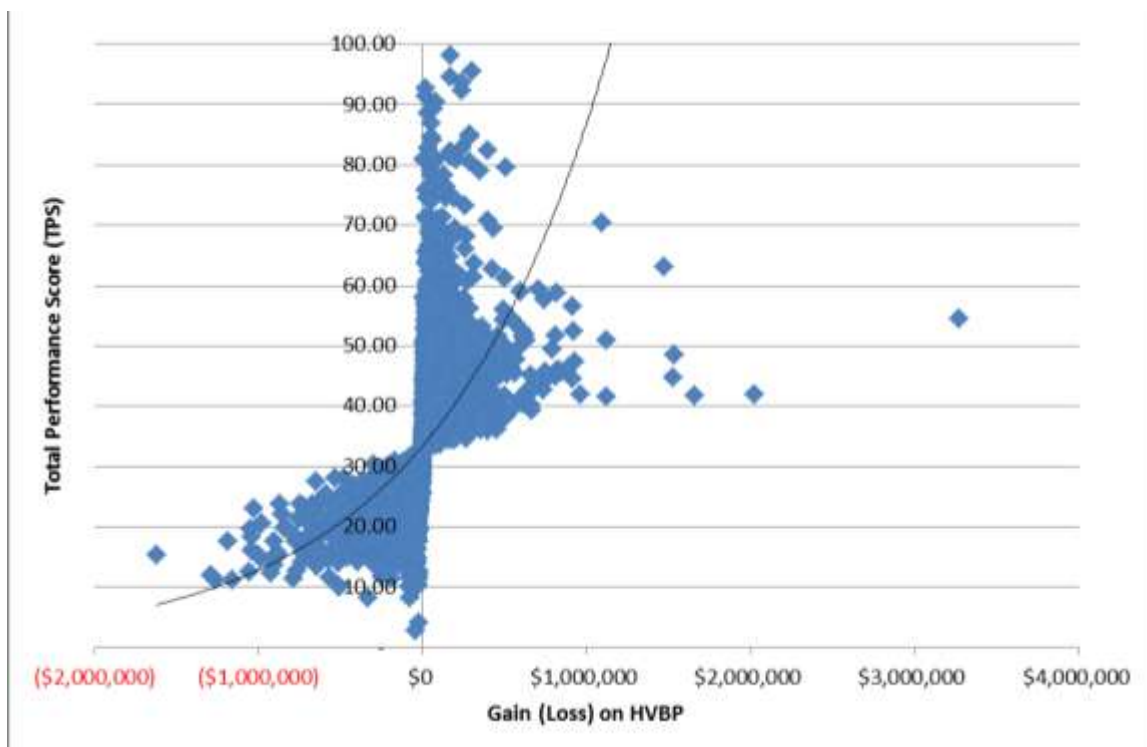
Table 2 shows the financial impact of VBP by region of the country as classified by CMS. The Middle Atlantic region will see the biggest loss (-\$15.6M) while the largest gain is in the East North Central region (\$13.5M). This table demonstrates the shifting of payments across regions with aggregate decreases (-\$21.1M) for the Atlantic states to increases in the Central (\$9.5M) and Mountain/Pacific (\$6.8M) states.

Table 2: The Financial Impact of Value-Based Purchasing by Region

Region	Region Name	n	Gain/ (Loss)	Total Operating Payment	% Gain/ (Loss)
1	New England (CT, ME, MA, NH, RI, VT)	129	2,380,574	4,572,798,757	0.05%
2	Middle Atlantic (PA, NJ, NY)	349	(15,561,305)	11,410,533,483	-0.14%
3	South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV)	498	(7,972,761)	17,231,518,586	-0.05%
4	East North Central (IL, IN, MI, OH, WI)	470	13,517,627	13,869,566,913	0.10%
5	East South Central (AL, KY, MS, TN)	261	(9,306,367)	6,674,741,862	-0.14%
6	West North Central (IA, KS, MN, MO, NE, ND, SD)	237	10,706,006	6,760,390,150	0.16%
7	West South Central (AR, LA, OK, TX)	427	(5,384,508)	9,592,716,210	-0.06%
8	Mountain (AZ, CO, ID, MT, NV, NM, UT, WY)	208	(2,241,620)	4,606,316,751	-0.05%
9	Pacific (AK, CA, HI, OR, WA)	376	9,090,086	9,007,034,148	0.10%

Table 3 presents the relationship between Total Performance Score and Value-Based Purchasing net gain/loss. The Total Performance Score, which includes domains of processes care, patient experience, outcomes, efficiency, and patient safety, results in proportional gains or losses in hospital reimbursement. Hospitals with TPS scores of 33 or greater are projected to receive positive VBP payments. It is significant to note that the outlier at the far right (with \$3.2M in VBP payments) is Mayo Clinic in Rochester, MN. The TPS for that organization was 54.42, which was not the highest. The highest TPS score goes to the Orthopedic Hospital of Wisconsin at 98.18 but because the VBP payment is also dependent on the amount of Medicare payment received, the Mayo Clinic score combined with their large Medicare service line resulted in Mayo Clinic receiving the highest VBP reimbursement. It is worth noting that Mayo Clinic was also rated the #1 Hospital in U.S. News and World Report for 2016.

Table 3: The Relationship Between Total Performance Score and Value-Based Purchasing



DISCUSSION

The issue of improving quality within teaching hospitals is due in part to the challenges associated with training medical students and residents. However, recent studies have shown little difference between patient care quality delivered by a resident or trainee versus attending physicians (Au et al., 2014). Shahian et al. (2014) point out that teaching hospitals often accept failing patients from other institutions in order to provide the most advanced care. This could impact portions of the TPS related to patient satisfaction and complications related to complex patients. The complexities of quality of care for teaching hospitals remains an area for future study.

The advantage for rural hospitals in VBP may be related to less complex patients and more control over the use of protocols, safety measures and quality improvement interventions. In fact, in the top 10 organizations for a positive reimbursement in VBP is a rural hospital in Oroville, California, population 15,500. This rural hospital with a high TPS score places it in a group of large organizations that include Mayo Clinic, Cleveland Clinic and Massachusetts General Hospital. Oroville's TPS is 70.35; however, they have only a 3 star rating in Hospital Compare. They do score better than the national average for HAC's, expected mortality for the 3 conditions (AMI, HF, and pneumonia) and better than the national average for MSPB.

From a geographic perspective, hospitals in the Midwest (East North Central and West North Central) receive significantly higher VBP payments. As a result, some of the hospitals in these regions could be used to benchmark best practices. Since VBP was established to shift dollars to high quality performing hospitals, it is unlikely that future changes to the ACA will impact the direction CMS is taking relative to Value-Based Purchasing. Therefore, hospitals, physicians, and other healthcare providers can expect continued growth in value-based purchasing initiatives in contrast to volume purchasing.

In spite of the ACA and CMS efforts, there are many underlying market failures that negatively impact quality and value within U.S. hospitals. These market failures include barriers to access for health services, poorly coordinated care leading to overutilization of services, avoidable hospital readmissions, and higher per capita healthcare costs compared to other developed countries. To get to a U.S. healthcare system that's affordable yet provides high quality and valued care, we must embrace new initiatives and foster accountability for healthcare value.

Our current fee-for-service system is based on the quantity of care provided, rather than the care actually needed by the patient, or the effectiveness of the treatment. Fortunately, pay-for-performance is a successful initiative designed to ensure high-quality care through better alignment of physician and hospital payment incentives. For example, a single bundled payment that can be appropriately allocated among all the clinical providers to create an incentive to keep a patient in good health and avoid costly hospital readmissions. In addition, ACOs can bring accountability to healthcare by providing a financial incentive to work together to improve the health of their patients, even agreeing to share responsibility and financial risk. If patients' healthcare costs end up being less than expected while the quality of care improves, the ACO providers get to keep a share of the savings. Implementing the best practices for Healthcare Information Technology (HIT) has proven to be helpful in improving the US healthcare system. Although implementation has proven to be costly for an organization, the long-term effects of HIT have shown cost savings, with increases in quality and better value in patient care. Also, HIT can create more engaged and informed patients as well as provide real time data for clinical decision making (Mendelson and Johnson, 2011).

VBP and other pay-for-performance initiatives will require hospitals to enhance their focus on patient care by modifying the business model under which they operate. These organizational changes will involve experimentation and innovation as they move through stages of transformation. Whether the payment and delivery system reforms currently being tested have the desired impact will depend on the nation's ability to continuously test new approaches, correct course when necessary, and apply lessons learned (Commonwealth Fund, 2015b).

As discussed by Conrad et al. (2014), continued pressure from policymakers, regulators, the organized public and private purchasers will create momentum toward value-based payment reform. Unfortunately,

healthcare has many systemic and cultural barriers to change causing providers and payers to move slowly. Also, in a decentralized healthcare system like the U.S., payment reform is a social and learning process for all stakeholders. However, we must continue to focus on innovation through payment models such as Value-Based Purchasing.

MANAGERIAL IMPLICATIONS

These results have important managerial implications as the hospital industry faces a more competitive environment and growing pressure to improve quality. Hospital leaders who wish to improve quality are challenged to implement new and innovative benchmarking approaches to improve efficiency and organizational performance. Reduction in operating expenses, elimination of unnecessary diagnostic testing, and evaluation of clinical interventions to maximize outcomes all need to be considered as we strive to improve value.

Our analysis found that outstanding hospital performance as measured by TPS generates increased revenue through value-based purchasing incentives. We believe that high performance work systems (HPWS) lead to improved quality and greater customer satisfaction. These result in higher performance in the TPS domains of: Process of Care, Patient Experience and Efficiency. Additionally, high performance work systems can improve Quality and Patient Safety.

While patient satisfaction is very important and requires continuing improvement effort, an organization struggling with reimbursement may need to focus their priorities on reducing HAC's or reviewing expected to actual mortality. With MSPB now a 25% weighted factor, hospitals need to continue their focus on maximizing efficiency. This is consistent with Harrison, Nolin & Suero's (2004) research on case management who found that improved efficiency had a positive financial impact on healthcare organizations while enhancing quality. As a result, hospital leadership is challenged to implement multidisciplinary programs that enhance efficiency, quality and value. Investigating and evaluating the components of the TPS will help guide organizations in setting priorities.

POLICY IMPLICATIONS

As policy makers seek to improve the healthcare delivery system, they should monitor the quality and efficiency of U.S. hospitals. Our analysis shows that the implementation of pay-for-performance programs and Value-Based Purchasing is an effective method to improve the value of healthcare services. It is important to note that many physicians express a lack of trust in health plan and government imposed change.

Physicians, nurses and hospital executives have legitimate concerns about the negative impact on quality associated with reduced reimbursement for healthcare services. They also recognize that the aging population and the growth in chronic care will put continuing pressure on healthcare expenditures. As a result, hospital leadership needs to implement innovative programs to improve quality and efficiency. Federal policy makers and state regulators recognize the growth in healthcare expenditures is not sustainable. Therefore, hospital leaders, government officials, and community partners must work together to ensure that quality and efficiency remain a top priority.

In summary, this analysis provides evidence that Total Performance Scores when linked to Value-Based Purchasing can have a positive impact on organizational financial performance. Future research should evaluate the relationship of the various payment models to improved health outcomes.

Information About the Authors:

Corresponding Author: Jeffrey P. Harrison, Ph.D., MBA, MHA, FACHE
Professor and Chair, Department of Public Health
University of North Florida,
Jacksonville, Florida
jeffrey.harrison@unf.edu
Phone: (904) 620-1440
Fax: (904) 620-1035

Debra A. Harrison, DNP, RN, NEA-BC
Vice President, Clinical Data Analytics, AMR

Robert Howey, MBA, MHA, CPA
Revenue Cycle Manager, Mayo Clinic
Jacksonville, Florida

Raymond Walters, BHA, University of North Florida,
Jacksonville, Florida

REFERENCES

- Au, A.G., Padwal, R.S., Majumdar, S.R., & McAlister, F.A. (2014). Patient outcomes in teaching versus nonteaching general internal medicine services: a systematic review and meta-analysis. *Acad Med.* (3):517-23. doi: 10.1097/ACM.0000000000000154.
- Blumenthal, D. & Squires, D. (2016). The Promise and Pitfalls of Bundled Payments. The Commonwealth Fund. Retrieved 12/12/16 from: <http://www.commonwealthfund.org/publications/blog/2016/sep/bundled-payments>
- Bosko, T., Dubow, M. & Koenig, T. (2015). Understanding Value-Based Incentive Models and Using Performance as a Strategic Advantage, *Journal of Healthcare Management*, 61(1), 11-14.
- Centers for Medicare & Medicaid Services. (2015). Hospital Value-Based Purchasing. Retrieved 12/12/16 from: <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/hospital-value-based-purchasing/index.html?redirect=/Hospital-Value-Based-Purchasing/>
- Commonwealth Fund (2015a). U.S. Health Care from a Global Perspective: Spending, Use of Services, Prices, and Health in 13 Countries. Retrieved 12/12/16 from: <http://www.commonwealthfund.org/publications/issue-briefs/2015/oct/us-health-care-from-a-global-perspective>
- Commonwealth Fund (2015b). The Affordable Care Act's Payment and Delivery System Reforms: A Progress Report at Five Years. Retrieved from The Commonwealth Fund.
- Conrad, D.A., Grembowski, D., Hernandez, S.E., Lau, B., & Marcus-Smith, M. (2014). Emerging Lessons from Regional and State Innovation in Value-Based Payment Reform: Balancing Collaboration and Disruptive Innovation, *The Milbank Quarterly*, 92(3), 568-623.
- Futrell, K. (2013). LIS of the future: supporting value-based measures for healthcare. *MLO: Medical Laboratory Observer*, 45(12), 8-12 5p.
- Harrison, J.P., Nolin, J. & Suero, E. (2004). The Effect of Case Management on U. S. Hospitals, *Nursing Economics*, 22(2); 64-70.
- Hayen, A.P., Van Den Berg, M.J., Meijboom, B.R. & Westert, G.P. (2013). Accountable Care Organizations: How to Dress for Success. *American Journal of Managed Care*, 19(6), 517-519.
- McCarthy, D., Mueller, K., & Wrenn, J. (2009). Geisinger Health System: Achieving the Potential of System Integration through Innovation, Leadership, Measurement, and Incentives, *The Commonwealth Fund*.
- Mendelson, D. & Johnson, E. (2011). HIT adoption key to provider success under healthcare reform. *Healthcare Finance Management*, 65(6):128, 130. PMID: 21692385
- Nguyen, O.K., Halm, E.A., & Makam, A.N. (2016). Relationship between hospital financial performance and publicly reported outcomes. *Journal of Hospital Medicine* (on-line), DOI: 10.1002/jhm.2570

Shahian, D.M., Liu, X., Meyer, G.S., & Normand, S.L. (2014). Comparing teaching versus nonteaching hospitals: the association of patient characteristics with teaching intensity for three common medical conditions. *Acad Med.* (1):94-106. doi: 10.1097/ACM.0000000000000050

Stiles, R.N., Mick, S.S., & Wise, C.G. (2001). The logic of transaction cost economics in healthcare organization theory. *Health Care Manager*, 26 (2): 85-92. PMID: 11293015

Wikler, E., Basch, P. & Cutler, D.M. (2012). 3 Strategies for Reducing Health Care Administrative Costs. *Center for American Progress*. Retrieved from:
<https://www.americanprogress.org/issues/healthcare/news/2012/06/11/11805/3-strategies-for-reducing-health-care-administrative-costs/>