AN EMPIRICAL INVESTIGATION INTO HEALTHCARE PERFORMANCE INDICATORS AND THE IMPLICATIONS FOR DEVELOPING A BALANCED SCORECARD

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ABSTRACT

A multitude of new and old performance measures are being used by healthcare leaders for effective management. This empirical pilot study summarizes the current measures being used by healthcare leaders. It is a first step towards better understanding the use of performance measures and implication for developing a balanced scorecard in healthcare organizations.

Introduction

Imagine that you are flying an airplane with only one or two indicators, airspeed and heading. The plane seems to be flying in the right direction and with the correct speed. Unfortunately, the airplane dashboard does not contain information about altitude, fuel, cabin pressure, or other key indicators. Is it really possible to operate the plane if you do not know at what altitude it is flying or how much fuel is left (adapted from Kaplan and Norton, 1996)? Healthcare organizations face the same type of problem. Just knowing, for example, the return on capital, mortality rates, or patient satisfaction levels, is not enough information for healthcare leaders to understand their operating issues, manage their resources wisely, and plan for growth.

Effecitvely operating, managing and leading an organization requires a variety of data across a multitude of functional areas. Historically, financial data were presumed to provide managers with 90 percent of the information necessary for managing. Although, financial data are precise, objective and readily available, they do not tell the whole story of a company's health. Financials are lagging indicators -- they show what happened in the past. Clinical data were used by managers to compensate for the remaining 10 percent of information necessary for understanding operational performance. Historically, crude measures of mortality, morbidity, and/ or C-section/ VBAC rates were presumed to provide all the clincial information needed. Like financials, these measures are precise and appear to be an objective view of the organization's clincial output, but they are often driven by uncontollable inputs – such as the level of patient severity – and not by the organization's level of quality. The historical measures reflect patient conditions as much as they reflect organizational performance. Interestingly, the driver behind many of the clincially-oriented indicators was and continues to be the Joint Commission on Accreditation of Heathcare Organizations (JCAHO) – an organization which requires a specific set of quality indicators to

be collected and monitored (Joint Commission Accreditation of Healthcare Organizations, 2006). More recently measures of patient and physician satisfaction are being used to provide useful information; however, these are lagging indicators which are often not precise enough to pinpoint operational issues. Measures of overall dissatisfaction with a hospital stay do not provide enough information for managers to improve. Even more detailed information such as satisfaction with nurse response to the call button or food service do not afford enough insight into the operational issues. What is needed are some leading performance measures that identify real-time problems, forecast what may be ahead and provide managerial direction.

Most healthcare organizations use some form of cross-functional or multidimensional measurement tools (Random et al., 2004)(Huang et al, 2004) (Cleverley and Cleverley, 2005), often referred to as a dashboard and sometimes called a balanced scorecard. The term 'dashboard' is often used interchangable with 'balanced scorecard'; however, there are fundamental differences. A dashboard suggests a consolidated report of operational measures that may or may not be directly linked to the organizational vision and strategies.It is typically a high-level report that includes metrics indicating changes in revenues or costs, volume of services sold and market share, and clinical metrics (Mazzella-Ebstein and Saddul, 2004)(Johnson and Frack, 2001). A Balanced Scorecard, by definition, is comprised of measures with a direct link to both the organizational vision and its strategies. It describes what has to be measured in order to assess the effectiveness of the organization's strategies (Kaplan and Norton, 1996). Organizations adopting a Balanced Scorecard report improved operational performance through the alignment of organizational vision with daily operations(Huang et al, 2004) (Meliones, 2000). The Balanced Scorecard approach to aligning strategy with action promotes focus on those key areas that impact the overall performance of the organization. In essence, a dashboard is a natural subset of a Balanced Scorecard and can be used to keep both top and mid-level managers focused on critical areas that affect overall organizational performance (Cleverly and Cleverly, 2005).

Balanced Scorecard

Balanced Scorecards are being adopted across many healthcare organizations as a model for assessing operational performance (Inamdar and Kaplan, 2002) (Zelman et al., 2003). Historically, the measurement system for healthcare organizational performance has been financial data and mortality rates; both of which focus on past events and do not address company assets such as motivated employees/ physicians, satisfied patients, and high-quality services, etc.; all of which yield important information about an organization's current status. However, recent literature suggests that the Balance Scorecard is gaining in popularity among healthcare leaders (Yap, 2005). The Balanced Scorecard retains traditional financial and clinical measures – based on past events - but complements these with drivers of future performance. A good Balanced Scorecard has a mix of outcome measures, such as financial and clinical indicators, and performance drivers, such as error rates, readmission rates, nursing turnover, etc. Together, these outcome and performance measures can be used to improve the efficiency and effectiveness of healthcare organizations.

History of Balanced Scorecard

In 1990, the Nolan Norton Institute, a research arm of KPMG, sponsored a one-year study of multiple companies entitled, "Measuring Performance in the Organization of the Future" (Kaplan and Norton, 1996). The outcome was a multidimensional scorecard designed for evaluating system performance. This became known as the "Balanced Scorecard" and was "organized around four distinct perspectives – financial, customer, internal, and innovation and learning. The name reflected the balance provided between short- and long-term objectives, between financial and non financial measures, between lagging and leading indicators, and between external and internal performance perspectives" (Kaplan and Norton, 1996).

Financial measures are generally lagging indicators of a company's financial status. That is, they tell management how things have been going financially with the company. Examples of healthcare financial measures include: payer mix, debt per bed, cash flow to total debt, current ratio, days cash on hand, average payment period, expense per adjusted discharge, bad debt expense, payment denials, and many others. Financial measures are indicators of how well things have gone in the past. Vonderheide-Liem and Pate (2004) say that a financial report tells you where you have been, not where you are going. They go on to explain that using a financial report to "steer" the company is like driving a car down the road looking in the rearview mirror.

The customer perspective focuses on such generic measures as satisfaction, retention, market, and payer mix. Core customer perspective outcome measures include outcomes that are important to customers such as short lead-times, on-time delivery, and/or innovative products and services. In healthcare some potential customer perspectives might include: physician satisfaction, home care patient loyalty index, patient satisfaction, inpatient loyalty index, employee satisfaction, market share in particular specialties, and others.

Internal business indicators on the Balanced Scorecard focus on internal processes that have the greatest impact on customer satisfaction and achieving the organization's financial objectives. In other words, indicators included on this perspective, report on processes that impact the first two Balanced Scorecard perspectives – financial and customer perspective. Internal business processes allow a healthcare organization to deliver the service value that will attract and retain customers in targeted market segments and also satisfy shareholder expectations of financial return. Core internal business measures in healthcare might include: inpatient mortality, infection control, rate of unplanned returns to emergency room, timeliness of admit/registration, repeat rates for clinical and radiological services, wait time for pain medication, registration error rates, nosocomial pressure ulcers, and many others.

Learning and Growth indicators identify company infrastructures that create long-term growth and improvement. There are three sources for growth and improvement: people, systems, and organization procedures. An example of an organizational procedure might include aligning employee incentives with overall organizational success factors, something which is routinely done at higher management levels, but rarely at lower levels. Some learning and growth measures from healthcare might include: percent turnover in nursing, healthcare information system capability index, number of hours of employee training, percentage of aides receiving at least one day of training over time period, number of employees receiving training on new equipment, percentage of computers updated or replaced in past 12 months, and others.

Healthcare organizations are continually challenged to produce high quality outputs with fewer resources. To remain financially viable, daily assessment of organizational performance and system processes is necessary, which requires the identification, assessment and understanding of key performance measures. The Balanced Scorecard approach, which has proven to be successful for many organizations, suggests a comprehensive list of performance measures.

Research Purpose

The purpose of this study is to better understand the healthcare performance measures that are currently being used for operational management and improvement. Forward-thinking healthcare leaders are challenging the ability of historical performance measures, such as financial health and mortality rates, to effectively lead their organizations into the future. New performance indicators, designed around daily managerial activities, are being established at almost every large healthcare facility. However, it is not clear if these measures include the comprehensive perspective of a Balanced Scorecard. The healthcare literature on performance measures that optimize operational excellence is limited and literature on the use of Balanced Scorecards in healthcare organizations is scarce. This research seeks to identify, compile, and understand the selection and use of performance measures critical to healthcare organizational success; thereby providing a current, state-of-the-art look at meaningful performance indicators that are being used across a multitude of large healthcare organizations. The results of this research will provide the foundation for future investigations that evaluate both the development and/ or presence of Balanced Scorecards in healthcare organizations.

Research Methods

The premise of the study is that existing performance measures for companies are mostly financial accounting measures, with a mix of basic clinical measures, and that many of these measures have limited use for measuring performance. Data for the research was obtained through a detailed questionnaire aimed at high-level healthcare leaders. Prior expertise and literature research led to the identification of over 150 potential performance measures. These performance measures were consolidated into 97 unique indicators and then grouped into two <u>functional</u> areas: financial and clinical. Within each of the functional areas are measures that cut across all four perspectives of the Balanced Scorecard. For example, the survey includes measures on the internal business perspective measures, such as Average Length of Stay, Acute Admissions and Dollars of Denied Claims, 31-Day Unplanned Readmissions, Wait Time for Pain Medication and Use of Dangerous Abbreviations in Medication Errors. Customer perspective indicators listed on the survey include Employee and Physician Satisfaction measures and the Inpatient Loyalty Index. A measure of learning and growth included on the survey was Turnover Rates as a % of the National Average.

The research questionnaire (See Appendix) asks respondents to rate the criticality of each performance indicator in performing their job duties, as well as to rate how critical they thought the performance indicator should be. Additionally, respondents were asked to rank the top five performance measures necessary for operational excellence. Analyses were performed to ascertain the frequency of use of each measure (how critical the indicator is), the gap between

the actual criticality and the perceived criticality (how critical should it be), and importance of various performance indicators (a rank order of importance).

A list of approximately 500 acute care hospitals was developed from a 2005 directory of U.S. hospitals with a bed-size of 250 or more. The list included information on the key leaders, the physical addresses, and email contact information (where available). Key leaders were mailed a hard-copy of the survey and a letter stating the importance of the research. Non-responders received a telephone remind call. In addition, Masters-level Healthcare Administration students were asked to use the survey as a part of an operations management course; this included having a senior leader from within their organizations answer the survey.

Findings

A total of 27 healthcare organizations responded to our survey, representing a response rate of approximately 5 percent. Over half of the respondents (14) were from Texas, a facet of the student-led data collection. Two respondents were from Virginia, and there was one respondent from each of the following states: Tennessee, Pennsylvania, North Carolina, New York, New Jersey, Michigan, Indiana, Illinois, and Florida.

Identifying facility and respondent information was optional. Of the respondents, 63 percent classified themselves as CEO's, seven percent were COOs and 30 percent claimed 'other'. Interestingly, there were no CFOs who responded to the survey, which is likely due to a CEO-targeted mailing.

Criticality of Each Performance Measure

Survey respondents were asked to rate the criticality of each of the 97 performance measures using a 1 to 5 Likert scale with 1 being not critical and 5 being extremely critical. Specifically two questions were asked, "If available, how critical is this to you in performing your job now?" and "How critical should it be?" The premise behind asking both questions for each indicator was to determine if there were some measures that were not currently being used by healthcare management but that would be useful (critical) if it were available. For example, two performance metrics listed on the survey were Home Care Patient Loyalty Index and Pain Assessed at Specified Intervals. Some healthcare organizations may not be collecting data on these measures, or it may be difficult to extract this data on in the timeframe necessary to make daily managerial decisions. The two survey questions were aimed at better understanding this possibility. The findings suggested there were little differences between the indicator ratings for each of these two questions. This may be due to the survey tool or it may be that organizations are routinely collecting critical assessment data.

The mean respondent score was computed for each of the financial functional area performance indicators, by question. Out of the 67 financial functional area, 15 indicators received a mean score of 4 or higher on the question, "How critical is it to doing your job now?" and 17 indicators received a mean score of 4 or higher on the question, "How critical should it be?" (Table 2). A review of the highest rated financial indicators suggests healthcare leaders may be concerned with the increasing number of uninsured or under insured. Specifically, Charity Care, Bad Debt Expense, Payer Mix, and Days in A/R were all considered highly critical and provide information on the percent of non-paying patients. Providing care to the estimated 46 million

people who are uninsured or under-insured is a tremendous burden for all healthcare organizations. In fact, most hospitals need 35 to 40 percent of their patients to be enrolled in managed care just breakeven.

Many of the other financial indicators that were considered critical by the respondents are indicative of the fact that hospitals have very little influence on the amount that they are paid by Medicare, Medicaid or managed care; therefore they have to focus on controlling utilization and maximizing efficiency. For example, by minimizing lengths of stay and labor expenses hospitals can optimize their efficiency. Outpatient surgeries were also considered an important performance indicator which is not surprising because outpatient procedures are generally more profitable than inpatient services; thus healthcare leaders want to assure a positive trend in this direction. Last, the inclusion of occupancy rates in the list of critical performance indicators may be driven by the capital intensive nature of healthcare organizations.

Indicator	How Critical is it to your job now: Mean Score	How Critical should it be: Mean Score
1. Operating Profit Margin	4.58	4.50
2. Charity Care	4.54	4.50
3. Days Cash on Hand	4.50	4.63
4. Net Profit Margin	4.46	4.38
5. Bad Debt Expense	4.38	4.35
6. Days in AR	4.23	4.33
7. Payer Mix	4.20	4.30
8. Outpatient Surgeries	4.19	4.24
9. Acute LOS	4.15	4.08
10. FTEs per Average Daily Census	4.15	4.16
11. Bad Debt Expense	4.12	4.35
12. Salary & Benefits Expense %	4.12	4.21
13. ALOS	4.10	4.20
14. **ER Visits**	4.04	-
15. Occupancy Rate	4.00	4.00
16. **Labor Cost per Adjusted Discharge**	-	4.15
17. **Supply Expense per APD**	-	4.07
18. **Acute CMI**	-	4.04
19. **Operating Expense per APD**	-	4.00

Table 2: Financial Functional Area Indicators with Highest Mean Score on Criticality to Performing Job and How Critical the Measure Should Be.

A comparison between those performance indicators that were considered critical to performing one's job and those that should be critical revealed only one performance measure, ER Visits, that was rated 4.0 or above on question 1 and not on question 2. Further analyses demonstrated the average rating for this indicator for question 2 was 3.96, an inconsequential difference. There were three indicators that received a mean score of 4.0 or above on the question asking how critical they should be, and less than that on the criticality to performing the respondents job.

Further investigation into these three indicators is needed to ascertain the implications. These three indicators were Supply Expense per APD, Acute CMI and Operating Expense per APD.

The mean respondent score was computed for each of the clinical area performance indicators, by question. Out of the 30 clinical functional area indicators, 11 indicators received a mean score of 4 or higher on the question, "How critical is it to doing your job now?" and 12 indicators received a mean score of 4 or higher on the question, "How critical should it be?" (Table 3). Evaluation of the clinical performance indicators that were considered critical suggests a concern over employee satisfaction. This may be driven by the shortage of nurses and many allied health professionals; thus, employee retention is imperative for healthcare organizations. Physician satisfaction was also considered critical and is important because physicians drive where and how services are delivered. This is particularly important in areas where physicians are building both specialty and full service ambulatory surgery centers and hospitals that will compete with traditional healthcare organizations. The expressed criticality of mortality and patient satisfaction may be due, at least in part, with the current healthcare environment. For example, the Center for Medicare and Medicaid Services publishes mortality rates annually and these are available to the public and; managed care organizations consider the patient satisfaction measures of healthcare organizations when forming partnerships and assessing contractual arrangements.

Indicator	How Critical is it to your job now: Mean Score	How Critical should it be: Mean Score
1.Physician Satisfaction	4.50	4.60
2.Employee Satisfaction	4.37	4.50
3.Hospital-acquired Infections	4.37	4.50
4. Surgical-wound Infections	4.23	4.33
5. Inpatient Mortality	4.20	4.40
6. Perioperative Mortality	4.20	4.20
7.Surgical Site Infection Rate	4.19	4.44
8. Medication Error Rate or Adverse Drug Events Due to Medication Error	4.19	4.35
9. Infection Control	4.08	4.38
10. Nurse Response Rate as Measured by Patient Satisfaction Surveys	4.04	4.19
11. Outpatient Mortality	4.00	4.00
12. **Use of Dangerous Abbreviations in Medication Orders**	-	4.04

Table 3: Clinical Functional Area Indicators with Highest Mean Score on Criticality
to Performing Job and How Critical the Measure Should Be.

A comparison between those performance indicators that were considered critical to performing one's job and those that should be critical revealed only one performance measure, Use of Dangerous Abbreviations in Medication Orders, that was rated 4.04 for question 2 and 3.98 on question 1 which is an inconsequential difference.

Ranked Importance of Each Performance Measure

 Respondents were asked to identify their top five indicators in the financial functional area. Indicators under the financial functional area include a mix of traditional measures, such as Operating Margin and Net Profit, as well as internal business perspective measures, such as Average Length of Stay, Acute Admissions and Dollars of Denied Claims and learning and growth indicators such as Turnover Rates as a % of the National Average. A tally for each of the financial functional area indicators that were ranked within the top five was computed. Chart 2 shows the tally for the financial functional area indicators. In total, 37 performance measures listed under the financial functional area were ranked in the top five by at least one of the respondents. The list of financial performance indicators was further analyzed to determine which of these performance metrics were considered critical to the majority of the responding organizations. Over 62 percent of the respondents included Days Cash on Hand as one of the top five financial area indicators, while over 40 percent of the respondents included Operating Margin as one of the top five. Thirty-seven percent of respondents ranked Payer Mix, Expense per Adjusted Discharge and Net Profit Margin as top indicators for understand the financial performance of the organization. Interestingly, all of the top ranked indicators are traditional financial measures of performance, with the possible exception of Payer Mix. Payer Mix is a facet of the organization's market position and contractual arrangements, thus it can be consider to be and internal business perspective indicator.
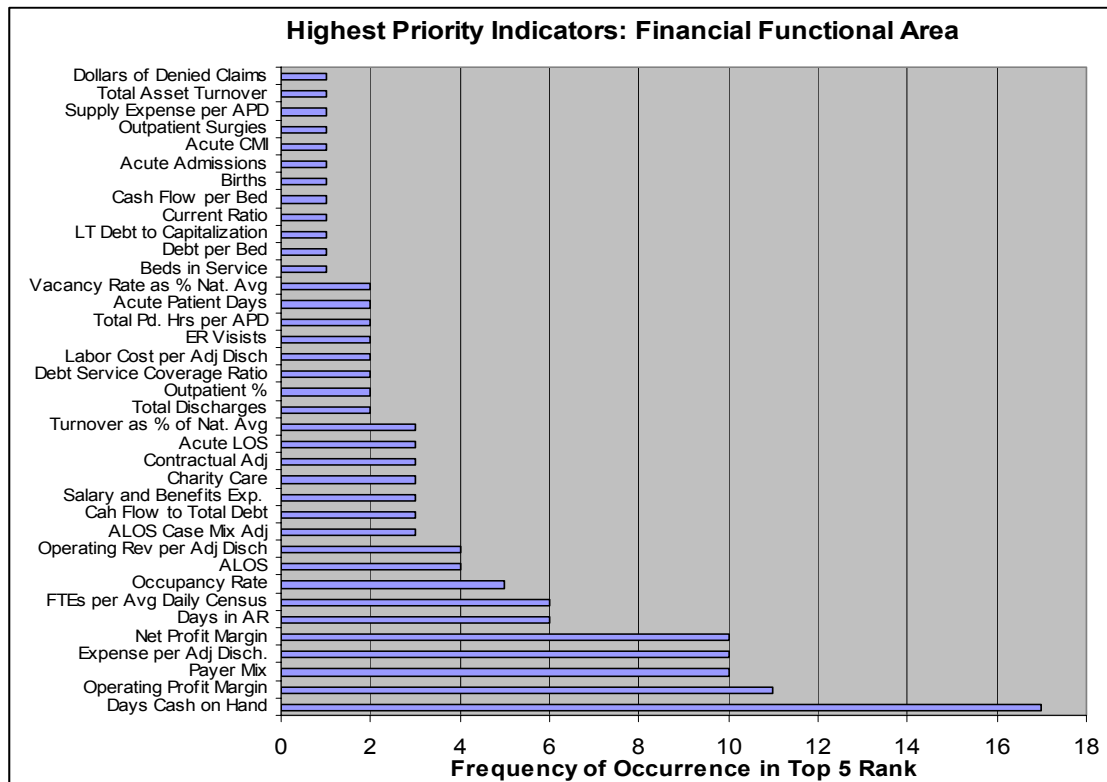

Chart 2: Highest Ranked Financial Functional Area Indicators

Respondents were asked to identify their top five indicators in the clinical functional areas. Like the financial functional area indicators, the clinical list including a mix of traditional measures, such as Mortality and Infection Rates, as well as internal business perspective measures, such as 31-Day Unplanned Readmissions, Wait Time for Pain Medication and Use of Dangerous Abbreviations in Medication Errors and customer perspective indicators such as, Employee and Physician Satisfaction measures and the Inpatient Loyalty Index. A tally of the clinical functional area indicators that were ranked within the top five was computed. Chart 3 shows the tally for the clinical functional area indicators. In total, 20 performance measures listed under the clinical functional area were ranked in the top five by at least one of the respondents. The list of clinical performance indicators was further analyzed to determine which of these performance metrics were considered critical to the majority of the responding organizations. Interestingly, satisfaction measures (a customer perspective) were more frequently ranked in the top five than other more traditional clinical indicators. Over 66 percent of the respondents included Employee Satisfaction as one of the top five clinical area indicators, while 55 percent of the respondents included Physician Satisfaction as one of the top five. Inpatient Mortality, a traditional indicator of clinical quality, also received a top five ranking by 55 percent of respondents. The other two frequently ranked clinical quality indicators have received notoriety recently and are a focus of the JCAHO. These indicators, Medication Errors/ Adverse Events due to Medication Errors and Nosocomial Infections were ranked in the top five by 44 percent and 37 percent of respondents, respectively. Nurse Response Rate as measured by Patient Satisfaction was also ranked in the top five by 37 percent of the respondents.
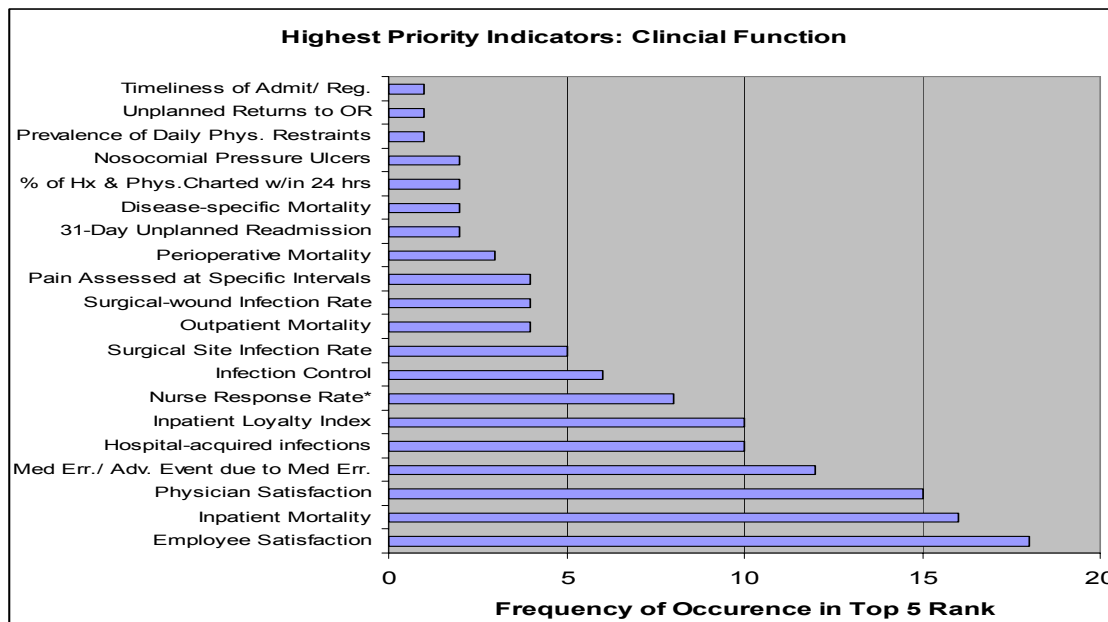

Chart 3: Highest Ranked Clinical Functional Area Indicators

Summary

A variety of performance measures are being used by healthcare leaders for effective management. Traditional measures of financial performance continue to dominate the list of measures that are routinely assessed. These measures are being complemented by a number of satisfaction indicators, perhaps due to the tremendous growth in competition and keen focus on

patient loyalty. New performance indicators are also beginning to be used by healthcare leaders. These indicators focus largely on errors, such as medication errors and unplanned readmissions, as well as infection control. The impetus for these indicators may be the JCAHO's requirements and/ or the recent public awareness of medical errors. More data are needed to validate these findings and to better understand how these performance indicators are used for operational management, improvement, and planning. Future research in this area is needed is to facilitate the wide-spread development and integration of performance measures. Ultimately, better understanding of performance measures will promote productivity in the healthcare sector by encouraging a managerial focus on performance outcomes that lead to better managed healthcare systems.

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