Health-Care Financial Management in a Changing Environment

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Concerns over escalating health-care costs have brought about significant changes in the way health-care organizations and professionals are compensated for their services. Capitation, the payment of a fixed fee to health-care providers in exchange for providing medical care when it is needed, has been a significant element of change in the health-care industry. The purpose of this paper is to propose a framework for the evolution of management accounting systems in a changing health-care environment. This framework suggests that the role of activity-based costing, life cycle costing, and value chain analysis becomes increasingly important as the payment for health-care services moves from fee for service reimbursement to capitation arrangements between insurance companies and health-care providers. Health-care organizations that design and implement accurate costing and evaluation systems will enhance their ability to compete successfully in this rapidly changing environment. J BUSN RES 2000. 48.183–191. © 2000 Elsevier Science Inc. All rights reserved.

Total health-care expenditures between 1980 and 1994 increased 400% from $250 billion dollars to over $1 trillion (Standard and Poors, 1995). In response to escalating health-care costs, the health-care industry, led by insurance companies, physicians’ groups, and hospitals, has established health maintenance organizations (HMOs) and other integrated delivery systems. Typically, these health maintenance organizations enter into capitation agreements with participating physicians, and/or hospitals, thereby, providing an essentially fixed revenue stream in exchange for some form of guaranteed care for the covered group.

With the emergence of this new way of doing business, the financial focus of hospitals and physicians must significantly change. Health-care providers (HCPs) that customarily focused on increasing revenues by providing a variety of services and maintaining high occupancy rates must now seek to control costs, while still providing quality service. The impact of this change is confounded by the fact that many HCPs have inadequate cost-accounting systems.

Failure to manage health-care costs and to obtain accurate cost information may leave HCPs ill-equipped to negotiate capitation agreements with provider networks and threaten their ability to remain competitive. Improved cost management systems, such as activity based costing (ABC) that identifies all activities associated with a specific treatment, and their corresponding cost, can improve financial cost management. These systems are expensive to implement, but may allow health-care organizations to more accurately determine and trace costs of services and develop a better understanding of the cost of services provided. Such advanced cost management practices as life cycle costing and value chain analysis provide the opportunity for integrated health-care providers to better manage total health care costs. Life cycle costing could provide integrated networks with the ability to understand total patient health-care cost over the life of an illness or even the patient’s entire lifetime. Similarly, value chain analysis can assist health-care providers in managing total patient health-care cost through the elimination of redundant services and increased efficiencies in dealing with other value chain participants, including doctors, hospitals, and insurance companies. To compete in the rapidly changing health-care environment, HCPs must develop an information system that provides financial and nonfinancial feedback in support of more advanced cost management methods. The HCP’s ability to develop the information necessary to benefit from life cycle costing and value chain analysis is positively related to the degree of integration within the network.

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The purpose of this paper is to discuss the role of managerial accounting in assisting HCPs to reduce cost and remain competitive. The first section provides an overview of financial trends affecting hospitals and other health-care providers. The second section presents a framework for applying ABC, life cycle costing, and value chain analysis in the health-care setting. Next, a more complete discussion of the application of these tools is provided. Finally, a discussion of control and performance evaluation systems is presented, followed by a summary and conclusions.

The Changing Health-Care Environment

Historically, hospitals have focused on generating revenues through increasing bed capacity, occupancy rates, fee for service rates, and the number of patients treated per day. This focus leads to a strategy of bringing more people into the facility for treatment by providing more and better services. The exact costs of these services to the hospital or their impact on profitability had not been a major consideration. Revenues were increased by marketing the treatment, with little concern for the cost of the specific treatment.

Managed care organizations emerged in response to pressure to slow the increase in health-care costs. These organizations vary in scope from health maintenance organizations (HMOs) to large integrated delivery systems. Integrated delivery systems are conglomerations of organizations that work together to provide health-care services to a population of patients, enabling higher quality care, more specialized services, and lower risks and costs to the provider. These networks usually cover a specific geographic area to provide needed health-care services to a given population. The impetus for integrated delivery systems comes from four different sectors: hospitals, physicians or physician groups, a combination of hospital and physician groups, and insurance companies (Shortall, 1995).

The idea of an integrated network is to develop a network of health-care services through exclusive relationships, capitation agreements, and mergers that will provide quality, convenience, and affordable health-care services to the covered population. A large integrated network should be able to increase cost efficiency by reducing duplicate services and paperwork. In addition, the network provides for a dilution of the risk sharing involved with capitation.

Capitation agreements between insurance companies, hospitals, and physicians provide that a fixed fee be paid per month, per person in the covered group. The fee is determined by an actuarial analysis of the covered population and the anticipated medical costs. One estimate is that, by the year 2,000, 95% of all medical treatment in some geographic regions will be covered under some type of capitation agreement (Carroll, 1995). As capitation agreements become the normal payment structure, revenues become more fixed and predictable, making cost control a more significant issue. HCPs traditionally emphasized increasing revenues to increase profits and/or return on investment (ROI). The emphasis is shifting from revenues to controlling costs. Cost control will become the primary financial management responsibility and the way to increase profits.

According to Fromberg (1996), capitation models generally fall into three basic types of contract between the payor, typically the HMO, and the service providers. The first type, with lowest degree of integration, is an agreement between the HMO and primary care physicians, specialists, and hospitals. The primary care physicians are paid on a capitated basis, but specialists are not capitated, and hospitals are paid on a per diem basis. With the next higher level of integration, specialists as well as primary care physicians are capitated. The highest integration occurs in a global capitation model in which the HMO enters into a contract for all health services with a physician–hospital organization.

Capitation can drastically affect the staffing procedures at hospitals. Some hospitals are trying to buy into the practices of primary care physicians and physician groups in order to provide an integrated primary care network to the public (Pallarito, 1994). Capitation also creates an incentive to increase the emphasis on preventative health care; providing the patient with preventative education and treatment to reduce and eliminate illness and disease over the patient’s lifetime. Hospital networks that develop wellness programs to promote healthy lifestyles may benefit from lower health-care costs in the future. An example of this approach to health care is discussed by Scott Goodspeed (as reported in Greene, 1995) who indicates that many hospitals are talking about “developing community-care networks to improve the health status of a geographic population.” Goodspeed, however, goes on to say, “Unfortunately, there’s not enough action” (p. 86). The importance of hospitals developing wellness programs is provided by Carroll (1995) who states that:

Under capitation, we have already received a per-member, per-month rate and are at economic risk for the cost of all services over and above the monthly premium paid by or for the member. The incentives under capitation are to keep the member healthy and to reduce the need for costly acute care services. (p. 28)

Integrated delivery systems with fixed revenues may reduce health-care costs by increasing the number of procedures that are performed on an out-patient basis, while still maintaining occupancy rates at the full-service hospitals. Out-patient costs are significantly lower than in-patient care, and development of new technologies that permit out-patient treatment, or lower cost home health-care options are likely to be encouraged.

Capitation creates winners and losers. Insurance companies support capitation, because their payments to hospitals and physicians are of a predictable, consistent nature, shifting some of the risk of the traditional insurance agreement to the
hospitals and physicians. One major risk of capitation is that an HCP that agrees to a capitation rate that is too low will face cost overruns caused by miscalculation of the medical needs of a given population. This miscalculation could result in significant losses or bankruptcy. An accurate cost and patient information system will help to minimize this risk.

Framework for Health-Care Financial Management

The previous discussion suggests that changes in the health-care industry have resulted in an increased focus on cost control. Figure 1 presents a framework for the application of activity-based costing (ABC), life cycle costing, and value chain analysis for the management of cost in the health-care industry. The framework indicates which of these tools can be utilized most effectively to control health-care costs across capitation models. In fee for service and simple capitation arrangements (those in which insurance companies or HMOs contract only with primary physicians), the framework suggests that activity-based costing and/or activity-based management (ABM) play the most important role in health-care cost management. As capitation agreements become more integrated, the use of life cycle and value chain analysis takes on greater importance in the management of total health-care costs. Additional analysis is possible, because the more integrated provider networks have a greater breadth of information related to a patient's lifestyle, wellness, illness, and treatment history. The rationale for the proposed framework is discussed below.

As health-care costs have increased, the political pressure to control these costs has also increased. Activity-based management has been shown to be an effective tool for cost management in a variety of settings. ABM is the strategic cost management concept that has evolved in some companies who have investigated and/or implemented ABC. ABC has been successfully applied in the health-care industry to reduce over-all treatment costs (Carr, 1993; Canby, 1995; Caltrider, Pattison, and Richardson, 1995). However, the use of life cycle costing or value chain analysis has not been commonly applied in the health-care environment. A possible explanation is that traditional health-care practice has not fostered the sharing of patient treatment information.

As the level of health-care integration increases, the benefits of and the opportunity to utilize value chain analysis and life cycle costing is also likely to increase. The integrated networks have access to a tremendous breadth of information related to a patient's lifestyle, wellness, illness, and treatment history that would typically not be available or important to less integrated networks. For example, a primary physician's patient that suffers a stroke and is rushed to the emergency room for treatment is not likely to have information regarding subsequent cost of treatment and rehabilitation. In addition, this cost information is of little benefit to the primary physician. However, to the integrated network that encompasses primary physicians, cardiologists, neurosurgeons, physical therapists, and the hospital, this information can be of tremendous benefit. With access to all information related to patient illness and treatment, the integrated network is in a position to utilize life cycle cost analysis. Over time, this integrated network can evaluate the impact of wellness and physical conditioning programs on patient health, including the likelihood of stroke or heart attack. With information regarding the impact of these programs on patient illness and the total cost of patient treatment, the integrated network can determine the net financial cost or benefit of sponsoring assorted wellness programs.

The highly integrated provider network is also likely to benefit from value chain analysis. Because the network is responsible for all phases of patient treatment it will be able to eliminate redundant testing and treatment. For example, when a patient consults with his or her primary physician regarding an illness, the primary physician may conduct some basic blood tests but not discover the patient's problem. The primary physician may then refer the patient to a specialist for further testing. In the absence of an integrated network, the specialist is typically reimbursed on a fee for service basis. Thus, there is little or no benefit to the specialist to be concerned with duplication of services. It would not be unusual for the specialist to complete the same tests conducted by the

Figure 1. Framework for health-care cost management.
primary physician, in addition to a new battery of tests. The integrated network could easily coordinate the treatment and eliminate this redundancy. In an environment in which the insurance company enters an agreement with the primary physician only, the primary physician may make the specialist aware of the tests that had been run, but there would be little incentive for the specialist to not repeat the tests and receive the corresponding revenue.

When a capitated arrangement includes both primary physicians and a group of specialists, the capitated group will receive some benefits of both life cycle and value chain analysis. However, the benefit will be limited, because information related to the patient from major providers, including hospitals and specialists that are not participating in the capitation agreement, will not be available. As the health-care environment evolves into greater degrees of integration, through broader capitation agreements, the benefit derived from life cycle costing and value chain analysis is likely to increase.

Cost Management Tools

The framework presented above suggests that as the health-care industry shifts financial focus from generating revenues to managing costs it needs to develop and implement an information system that will accurately determine, allocate, and analyze costs. To accomplish this, it was suggested that ABC, life cycle costing, and value chain analysis take on varying levels of importance dependent upon the capitated arrangement. This section provides a more thorough discussion of these three models of analysis useful for the financial management of health-care organizations. First, the primary features and benefits that distinguish an ABC system from traditional costing systems are presented. This is followed by a discussion of how value chain analysis and life cycle costing principles can be applied to the health-care environment.

Activity-Based Costing

Activity-based costing, when properly implemented, provides information for strategic decision making and better cost control. Accurate cost information can help management understand the operations of the network and provide more accurate costing of patient services.

Conventional costing systems used in the health-care industry typically use a single allocation base (cost driver) to assign costs to departments and services. That is, conventional systems use one attribute (number of employees, number of patients, number of hours) when allocating costs from one department to another or from a department to a service provided to a patient. The result is an accumulation of costs that may reflect little or no direct relationship between costs incurred and the service(s) provided. This single basis for assigning costs usually leads to low volume or complex treatments or procedures being under costed; whereas, high volume or routine treatments are overcosted. Many conventional costing systems also fail to address fixed costs adequately. In the health-care industry, where fixed or common costs (building, equipment, administration) are large, the allocation of those costs must be as accurate as possible. Many conventional costing systems allocate this cost arbitrarily to departments, which then re-allocate the cost to the service provided to a patient using a single allocation base.

An ABC system focuses on activities performed with costs accumulated at the activity level. An activity is defined as a unit of resource used for the benefit of the patient. There are two types of activities, those that directly affect the patient, and those that indirectly affect the patient. Examples of direct activities include: nursing care, pharmaceutical, physician care, and lab tests. Examples of indirect activities may include: bookkeeping, hospital maintenance, utilities, depreciation, and hospital administration. ABC attempts to identify all processes related to patient treatment. Next, the underlying activities associated with these processes are identified. This identification facilitates more accurate accumulation of cost and the assignment of logical cost drivers. Costs of indirect activities are allocated to the direct activities that they benefit. Finally, direct activities are allocated to services received by the patient. ABC is an attempt to minimize arbitrary allocations of fixed common costs, however, in most situations, some costs remain that are still allocated on an arbitrary basis.

An additional benefit of identifying the processes and activities underlying patient treatment is that management is likely to discover that not all activities add value. That is, they provide no benefit to the treatment of the patient. This discovery presents management with the information necessary to manage/reduce total service costs. The next step in activity analysis is to improve the efficiency of activities. This process includes the attempt to reduce or eliminate nonvalue-added activities. Use of ABC concepts to facilitate the identification and reduction of nonvalue-added activities is frequently referred to as activity-based management (ABM).

The ABC system must identify all of the activities involved in the treatment of a patient and allocate the cost of those activities to the patient through the use of cost drivers. A cost driver is the attribute for allocating costs that is most correlated with a given activity. An example of a cost driver for nursing care provided under an ABC system would be the amount of care (hours) required by the patient. Conventional costing systems have frequently used a flat per day rate for each patient, regardless of the amount of nursing care provided. The problem with this system is that the treatment of a patient requiring very little nursing care time is usually assumed to cost the same as a patient that requires significant nursing care time. Thus, the lower care patients have been subsidizing the more intensive care patients. Some procedures or treatments that regularly require more nursing care have been costing the hospital more than was apparent under a conventional costing system, thus making the treatment seem more profitable than in reality.
Carr (1993) provides an example of the process of developing an ABC system for nursing service at Braintree Rehabilitation Center. Three skill levels of nursing services: RN, LPN, and NA were identified. The corresponding pay scale was determined to vary from $26 per hour to $8 per hour. Braintree developed a team of staff members, all familiar with the work flow of the hospital, to conduct and analyze time, motion, and frequency studies of both routine and special nursing events. The team compiled the information to develop a patient information/classification form, which was used to establish a database that shows the distribution of nursing care by type of activity and by diagnosis. They found that routine nursing events, those performed for almost every patient, represented anywhere from 5% to 70% of the nursing care time provided, depending upon the medical problem and length of stay. As a patient's rehabilitation progressed, lower-skilled nursing care typically replaced higher-skilled nursing care. This process allowed them to manage staffing more efficiently and provide better cost assessments for the services provided.

Chan (1993) demonstrated how information from the Standard Treatment Protocol can be used in the development of an ABC system for the tests conducted in a hospital laboratory. Ramsey (1994) developed two hypothetical examples for applying activity-based costing to a radiology department and a nursing station in hospitals. Although the scenarios were hypothetical, they provided a framework for the application of ABC in the hospital setting. Each of these papers also provides a thorough discussion of steps for implementation of an activity-based costing system.

Canby (1995) reports that ABC was used to determine the costs of service in the X-ray department more accurately at a medium-sized outpatient clinic. Primary activities were identified and costed for each X-ray procedure. Secondary activities were also identified and costed. Finally, overhead, such as janitorial, heating, and electricity, were allocated using square footage of the X-ray department as the base. ABC analysis enabled the manager to more accurately predict the impact of expected or planned changes in the service mix on resource utilization, particularly with respect to labor and materials costs associated with primary activities. Analysis of the costs of secondary activities provided management with a tool to assess the efficiency of a work center, because these secondary activities included training, telephone answering, forwarding and receiving of films, and other miscellaneous direct labor costs. Although such general overhead as electricity and janitorial services could have been more accurately allocated, down to the primary activity level, relatively little or no benefit would be provided to management of the X-ray department for the additional cost of this precision. The treatment of general overhead illustrates the need to compare the cost of refined measurement and level of accuracy against the benefit derived. Attention should be focused on whether management's understanding of the operations are significantly enhanced with more refined information.

Caltrider, Pattison, and Richardson (1995) report that ABC became an integral part of the continuous quality improvement (CQI) program implemented at Children's Hospital in San Diego. A review of hospital records had identified the orthopedic outpatient clinic as one of the four highest cost areas in the hospital. An ABC assessment indicated that management of financial and medical information consumed two-thirds of the labor time in the clinic. The information derived from ABC analysis, coupled with the hospital's CQI program resulted in a 20% reduction in the cost of treating femur (thigh bone) structures in this department.

Lawson (1994) discussed the adoption of ABC in a health-care organization operating in five geographic regions and providing two main services. The implementation of ABC focused on the allocation of administrative overhead. Before the adoption of ABC the organization's traditional system allocated the cost of administrative overhead within a 5% range for both services in the five regions. The ABC analysis revealed that there was a 30% fluctuation in the consumption of administrative overhead for one of the two services. For the second service, the author found that the administrative overhead varied by a factor of 30. That is, the most expensive region consumed 30 times the overhead of the least expensive region, leading the author to conclude that traditional costing system inadequacies exist in the health-care environment much the same as in manufacturing settings.

Because ABC requires determining activities and developing an understanding of their underlying processes, identification of inefficiencies related to such nonfinancial factors as patient waiting time and duplicate processes is facilitated. Corrective action to improve these inefficiencies can reduce cost and improve the quality of customer service.

Although ABC has been primarily applied in manufacturing environments, it offers many potential benefits to the health-care industry. However, there are also some potential problems. In a survey of ABC adopters, Shields (1995) found a wide range of implementation success/failure. Specifically, Shields reported that top management support, implementation training, linkage of ABC to performance evaluation/compensation, linkage of ABC to quality initiatives, and the adequacy of resources for implementation were significant predictors of successful ABC implementation. These five factors accounted for 51% of the variance in predicting ABC success. The implications of this finding for successful implementation of ABC in a health-care environment are that management must be committed to the implementation effort and must support the effort through adequate resources and training. Further complicating the application of ABC to hospitals and other health-care organizations is the fact that each patient represents a specialized product. Identifying underlying processes and activities in this environment is a time-consuming and expensive task. However, when negotiating
capitation agreements, it is a step that could mean the difference between survival and insolvency.

Once costs have been accurately determined, management will be better positioned to make informed decisions in the changing health-care environment. A health-care organization's understanding of total patient service cost may be further improved by applying value chain and life cycle costing principles, discussed in the following section.

**Value Chain and Life Cycle Analysis**

The concepts of value chain analysis and life cycle costing require developing an understanding of all costs related to delivery of a product or service to the final consumer. These concepts may be beneficial in the health-care environment, particularly in the design and control of integrated health-care networks. Specifically, these organizations will need to determine how they can organize and cooperate to maximize patient benefit while reducing cost. Through cooperation, information can be shared that reduces costly duplication of such administrative services as form filing and accumulation of general patient information. Additionally, cooperation can result in the elimination of unnecessary duplicate tests and procedures (nonvalue-added costs). Such sharing of information is, in many respects, new to the profession, and steps must be taken to ensure patient's confidentiality rights.

Shank and Govindarajan (1992) define a value chain for any firm as "the linked set of value-creating activities all the way from basic raw material sources through to the ultimate end-use product delivered into the final consumer's hands" (p. 179). It is generally held that, given an organization's mission and competitive strengths and weaknesses, it defines where it can best compete in the value chain. Once an organization understands its niche in the value chain, management then looks upstream and downstream in the chain to determine how they can improve conditions between/with other organizations in the chain to the mutual benefit of all parties involved.

Vital to the use of value chain analysis is the development of an understanding of the major processes involved in the value chain. Although this approach does not require the utilization of activity-based costing, its use can be beneficial in understanding the linkages in the value chain within one organization or between organizations. An understanding of business processes, both within and outside the organization, leads to the identification of opportunities to remove cost from the value chain. An example of exploiting linkages in the value chain is provided by Procter and Gamble's (P&G) installation of order entry computers directly in Walmart stores. Although this resulted in a capital outlay for P&G, the over-all entry and processing costs for both firms were substantially decreased, resulting in total value chain savings (Shank and Govindarajan, 1992). Similar examples have occurred in the retail industry, where manufacturers and distributors have coordinated delivery schedules so that as a ship-

ment of goods arrives at a distributor's dock, a distributor's truck is waiting to load the material and take it to its final destination. This operation, known as cross docking, has resulted in significant reduction in warehousing and material handling cost by distributors, through cooperation and coordination of logistics operations with suppliers.

A study conducted by the Joint Industry Project on Efficient Consumer Response (1994) sought to identify opportunities for improving performance in the grocery supply chain. A key finding in a pilot project carried out between Procter & Gamble and H.E. Buts was that by adopting an activity-based view of the supply chain, value-added activities can be identified and business processes can be enhanced/streamlined/eliminate. The net effect of this process is a reduction in total cost of putting the finished product in the consumer's hands.

In cases where no one participant operates in all phases of the value chain, the successful implementation of value chain analysis is dependent upon cooperation and information sharing among trading partners. This cooperation is necessary to identify opportunities for savings and to obviate duplicate provision of services. In the health-care environment, such cooperation may be limited in the absence of integrated provider networks. This situation arises out of patient privacy laws that hinder sharing of information between unrelated value chain participants. However, as networks become more integrated, the opportunity to share information and exploit linkages in the value chain expands.

To apply value chain analysis to the health-care industry we might consider patient health as the desired output. The value chain would then include all aspects of patient health, from health education to fitness and wellness programs, through all activities associated with routine and acute care. Health-care providers must determine which links of this chain are consistent with their mission, given the entity's relative strengths and weaknesses. Finally, communication channels must be established that allow hospitals, physicians, and other care providers to work together with other participants up and downstream in the value chain. For example, a regional hospital's value chain would include the suppliers of pharmaceutical products, the manufacturers of diagnostic equipment and surgical equipment, the private practice physicians whose patients use the hospital services, and the ambulance services that transport patients to the hospital. If a hospital works with all members of the value chain to identify inefficiencies and nonvalue-added costs, industrywide costs can be reduced.

The opportunity to develop health-care value chain analysis seems to be emerging through the development of integrated health-care systems previously discussed. Pawola and Kline (1996) report that the growth in development of the integrated delivery system (IDS) requires a shift in the type of information required and the focus. Rather than the traditional focus on departments and single entities, the need emerges for an enterprisewide focus capable of automating and inte-
grating all patient functions, both patient care and financial information. According to Pawola and Klineman

An efficient information system can contribute to the entity’s ability to provide cost effective quality care by 1) providing timely information, 2) assisting in resource conservation, 3) facilitating the sharing of accurate and reliable information with others in the IDS, within security restrictions, 4) assisting in management of a patient’s care delivery process, including all aspects of wellness and disease, and 5) by having the ability to statistically analyze and predict the demand for services by a given population of subscribers. (p. 46)

The value chain analysis approach can provide the IDS with the ability to determine where in the chain the greatest cost competencies and efficiencies can be captured. Applying the principles of value chain analysis will provide a framework for developing, managing, and improving the efficiency of these organizations.

Life cycle costing provides an opportunity to organize thinking within the value chain (Hirsch, 1994, p. 128). Within a manufacturing organization, all products go through a life cycle, beginning with research and development and continuing on through introduction to the market, growth, maturity, decline, disposal or discontinuation. Similarly, the life cycle of patient health care begins with prenatal care, through birth, development, education, maturity, aging, and finally death. In fact, prenatal care is a part of two individual’s life cycles at the same time, because the care provided to the fetus is a result of caring for the woman during pregnancy. The performance of health-care providers at each stage of a patient’s life cycle is likely to have an impact not only on the patient’s well-being, but also on the demands placed on resources of organizations providing care at subsequent stages of the patient’s lifecycle. Therefore, a life cycle perspective would provide HCPs with the opportunity to evaluate the impact of preventative health-care expenditures over the patient’s lifetime on the health-care costs incurred late in the patient’s life. This analysis would allow the providers to analyze statistically whether the increased expenditures on preventative care are offset by a reduction in the rate of increase in patient health-care costs later in life. An alternative view to life cycle costing may be more manageable in the short run. This alternative would be to look at the total costs of treatment over the life cycle of a specific illness or condition. An approach such as this could also be of benefit to the less than fully integrated health-care networks.

To effectively negotiate capitation contracts, physician groups need essential data regarding costs and utilization of services. The traditional fee-for-service model created economic incentives for the physician to maximize resource use and active treatment. Barber, Jones, and Johnson (1996) suggest that with a capitation contract, the economic incentive has been shifted to one of over-all patient health outcomes and preventative health efforts. This approach and the subsequent incentives created exemplifies the life cycle approach to health care, and the physician must understand the degree of risk that has now been shifted from a managed care organization to the contracting physician. The physicians that recognize this risk shift and implement offensive procedures by providing preventative health care, health education, and programs to reform patient’s poor health practices may enhance their ability to profit under capitation contracts. A potential downside is that the physician group that has successfully implemented wellness measures is now serving a population that is at a low health risk threshold. This covered population has now become a desirable group that could be purchased by other competitor HCPs.

Health-care organizations that develop a value chain and life cycle approach will need to evaluate the relative contributions of health care provided at each stage of a patient’s life. Assessment of such factors as patient benefits derived from health education programs, wellness programs, and other preventative care programs must be conducted. However, these benefits will not be fully realized without tracking the appropriate information. The next section presents a discussion of the types of information, controls, and performance evaluation measures necessary for this level of cost analysis.

Control and Evaluation Systems

From a financial management perspective, a good control system should provide information on total service cost as well as information useful in monitoring past capitation agreements and negotiating future agreements. The control system should also classify this information by risk category of the patient. For example, it must be determined if the activities performed in any given procedure, whether it be treatment of a back injury or heart bypass surgery, are different across patient risk categories. These risk categories might consider factors such as age, gender, smoking or drinking habits, and general physical condition. Health-care providers that can identify differences between risk categories of patients and activities necessary to treat patients from different categories are better equipped to negotiate capitation agreements with covered groups. In addition, this information can be used to identify the benefits derived from various types of wellness or preventative medicine programs. Employing a life cycle perspective of patient care results in designing a control system that accumulates and monitors key patient characteristics and treatment activities. Ultimately, the impact of such services as education and wellness programs on the level of acute care provided to the covered group can be evaluated.

The type of information generated by the cost information system and the frequency of reporting can also influence both cost management and physician behavior. Eldenburg (1994) studied the impact of reporting case cost information on mean level and variability of services provided by hospitals and
physicians in the state of Washington. The results of this study indicate that the mean level of services provided by hospitals is not significantly affected by the frequency of cost reporting, but the variance of average services is smaller for hospitals that report on a more frequent basis. In addition, this study analyzed the treatment orders of physicians who received reports that compared their case costs with the average case costs of other physicians in the same hospital or geographic region. The report enabled the physician to determine if he or she was an over/undertreater or close to the average. The results indicated that both the mean level of services and the variance in services provided were lower for physicians that received these comparative reports. More frequent and comparative reporting resulted in better utilization of hospital resources and lower average hospital charges. Thus, the cost-reporting system can influence both the quality and the cost of health care. Awasti and Eldenburg (1996) extended this study to 1,200 physicians with practices in four populous states. The results of the previous research was confirmed and further reported that providing physicians with information about the costs of tests and procedures can play an integral part in a hospital’s strategic cost management program.

The development of more advanced financial management methods alone is inadequate to permit hospitals to compete and survive. The design of a control system to ensure financial viability and quality of service dictated by the organization’s mission is also critical. If the mission of the HCP addresses quality of service, then the control system must be adequately designed to generate the information required to ensure that quality service is provided. If costs are lowered at the expense of personal patient care by offering fewer services to patients, less personal attention, or long wait times, the long-run viability of the HCP could be threatened.

To ensure quality of service, control systems must identify and measure attributes consistent with quality service. Such measures include patient cycle time, repeat visits for the same diagnosis, and number of misdiagnoses. Measures such as these allow the health-care organization to identify key quality factors or objectives not being met. To focus further attention on these quality factors, cost of poor quality indices might be developed. For example, releasing patients prematurely and having them return for additional treatment creates cost for the hospital in addition to creating customer ill will. Hospitals must have information available to compare the costs saved by treating and releasing patients quickly with the potential total cost of patients returning to the hospital for additional treatment and the cost of subsequent ill will. Misdiagnosing a patient can result in a similar outcome. Prior to capitation, there was no incentive for hospitals to track these costs, because patients generally were kept longer, for example, maternity stays. In addition, a re-admitted patient generated additional revenue. As capitation agreements emphasizing fixed revenue streams become more prevalent, such quality failures create a cost to the hospital that cannot be recovered.

**Summary and Conclusions**

This paper discusses current trends affecting health-care services providers. As health care moves from a fee-for-service environment to one in which providers are presented with a fixed revenue stream in exchange for treatment of a given population, cost control becomes increasingly important. An ABC system, coupled with the use of value chain analysis and a life cycle costing approach to patient care, provides emerging integrated health-care organizations with the opportunity to manage costs more effectively. The benefit derived from ABC, life cycle costing, and value chain analysis increases with the degree of integration of the HCP network. A precise cost measurement and allocation system coupled with a control system that focuses on quality of care and cost by patient risk category provides management with the ability to negotiate less risky capitation agreements, as well as to determine the long-term effectiveness of such advance programs as education, wellness, and preventative care.

The authors thank participants at the American Association for Advances in Health Care Research Conference and two anonymous reviewers who contributed to the development of this manuscript.

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