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W. Lee

Sakthi Mahenthiran

Butler University, smahenth@butler.edu

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Managing Healthcare Costs Through Structural Rearrangement of Hospitals: An Activity Based Management Perspective

Wonsick Lee

Assistant Professor of Management
Central Connecticut State University

Sakthi Mahenthiran

Assistant Professor of Accounting
Penn State University at Erie

■ **ABSTRACT**

We examine a structural deficiency in the healthcare system that hinders implementation of a meaningful cost accounting system, and suggest an alternative organizational arrangement that can facilitate introducing cost control mechanisms. We argue that hospitals need structural rearrangement so that cost-driving activities can be traced, and their costs allocated to responsibility centers. We suggest that this structural rearrangement is a precondition for implementing any meaningful activity-based cost management system. We also suggest a basic framework for value analysis of activities for healthcare providers, and discuss how this framework can be used as a vehicle for controlling diagnostic costs.

Background

American political leaders are concerned about increases in healthcare costs and are attempting to identify the problems in healthcare administration. Some critics of the present healthcare system warn of the possibility of sky-rocketing healthcare cost bankrupting the American economy in the next few decades. An Activity Based Cost Accounting (ABC) system has been suggested as an effective tool to manage and control costs in hospitals (Chan, 1993). ABC is receiving a lot of attention among corporate controllers and other cost accounting professionals. By distinguishing value-added from non-valued activities and focusing on reducing the cost of non-valued activities, organizations can achieve cost savings without damaging the quality of products or services offered (Cooper and Kaplan,

Requests for reprints or correspondence concerning this article should be sent to: Wonsick Lee, Central Connecticut State University, School of Business, and Sakthi Mahenthiran, Penn State University at Erie, School of Business.

1991). This approach to cost control is well established in the manufacturing sector (Hawks, Bondies, Strong and Reid 1992; Bhimani and Pigott, 1992).

Unlike manufacturing industries, hospitals and other service sector organizations have an inseparable reciprocal relationship between the service delivery process and the service outcomes. Therefore, it is much more complicated and difficult to introduce an ABC system of cost management in hospital organizations. Further, in this paper we point out the structural impediments to implementing an activity based management system in a hospital.

In attempting to examine the possibility of introducing an ABC system, we considered that there are fundamental structural problems that inhibit cost management in the healthcare industry. In service organizations, efficiency improvements are inherently tied to improving labor productivity (Hemeon, 1989). In developing measures of employee activities in service organizations, it has been suggested that the time spent by employees for various activities be sampled at representative points in time (Crane and Meyer, 1993; Hilton, 1991). The time data can then be transformed to cost information.

In one pre-arranged instance, we attempted to sample cost data in a hospital based on guidelines suggested in the accounting literature. Based on our analysis of the sampled data, we made recommendations to rearrange employees' activities in order to improve the cost management system, particularly those of laboratory technicians. The hospital administrators strongly opposed any such rearrangement of activities. They argued that the lab was operating at full capacity, and hence, the rearrangement of activities would not help reduce costs. This and similar incidents have made us believe that certain pre-conditions must be met before any cost management is considered seriously. Systemic incentives must be provided to all the constituents involved in order to attempt substantive cost control in a hospital.

In the United Kingdom attempts are currently underway to implement management information systems that are founded on the principles of activity based cost management systems (Holford and McAulay, 1987a and 1987b). The National Health Service (NHS) in the U.K. found that unless physicians are held accountable for the budgets they have traditionally prepared, administrators will find it difficult to hold anyone accountable for cost overruns in the hospital departments. NHS would like physicians to be responsible for preparing budgets along "patient portfolios" rather than along functional lines. This belief of NHS is a necessary first step for requiring departments to analyze their activities along specialties (*i.e.*, treatment groups) they care for. The NHS believes this would avoid arbitrary allocations that are presently necessary to arrive at the full costs of providing treatments to particular diagnosis related treatment groups. However, an NHS enforced, unilateral approach to introducing the necessary information system is not likely to succeed in the U.S. because in the U.S. physicians typically are not employees of a hospital, or of a central agency such as the NHS. Hence, there is a need for structural rearrangement to align incentives of U.S. physicians with those of the hospitals in which they practice.

Founded on such conclusions, we undertake the following tasks in this paper: (1) we examine the structural deficiency in the healthcare system which we believe prevents cost-

management; (2) suggest an alternative organizational arrangement which can better align the incentives of healthcare providers (we believe that this structural rearrangement is a precondition for implementation of the meaningful, activity-based cost management system), and (3) suggest a basic framework of value analysis which can be used to analyze healthcare service activities.

Current Structural Arrangement in For-Profit Hospitals and Cost Management

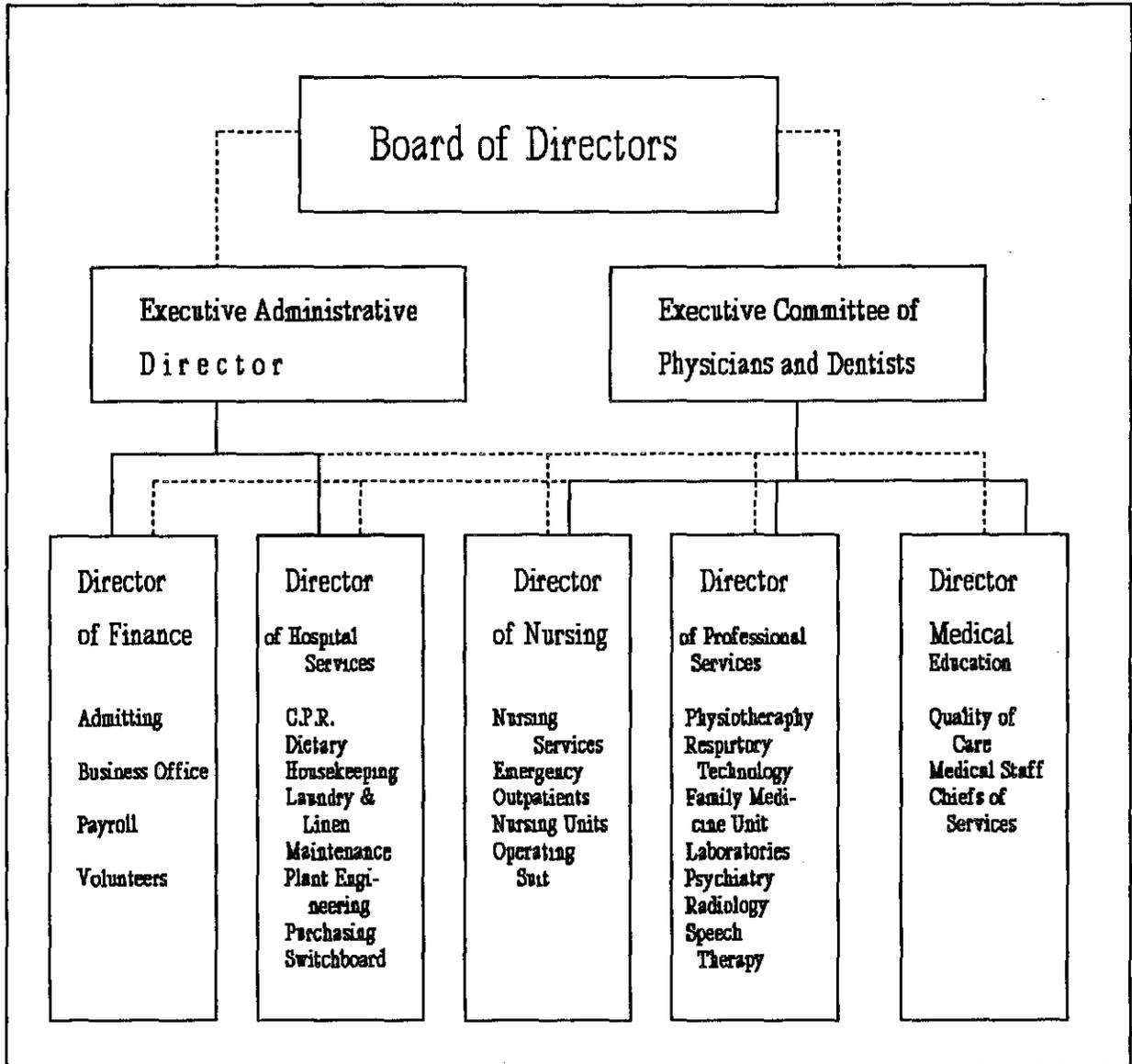
The current structural arrangement of for-profit hospitals can be summarized as a "dual-control" system: professional medical services are controlled by a group of senior physicians and administrative services are controlled by hospital staff administrators. Although hospital administrative executives may have formal authority over professional services in a hospital, they will rarely exercise their authority to overrule the medical practices of physicians. Practically, administrators may not have power over medical professionals, as argued by strategic contingency theorists (*e.g.*, Pfeffer, 1983; Hinings, Hickson, Pennings and Schneck, 1974). This is because medical professionals, especially physicians, contribute to critical resources (*i.e.*, patients), upon which hospitals depend. This "dual control" system is well illustrated in an actual organization chart of a local hospital the authors studied (See Exhibit 1).

The formal organizational chart of the hospital depicted in Exhibit 1 is modified to show actual lines of authority among functions and positions. The executive administrative director has direct control of non-medical staff functions. He has formal authority over medical services, though no real and direct formal control over professional service functions, as noted by the broken lines. On the other hand, the executive committee of physicians and dentists has direct influence over all professional, medical service activities. They, in fact, have significantly more influence over various staff service activities than executive administrators do. The dual authority system of this local hospital is not a-typical for hospitals.

The Hospital Administrators

In most traditional investor owned hospitals, administration is separated from the activities of delivering medical services. Most of the physicians serving in a hospital are effectively customers of the hospitals (independent contractors). The physicians bring their own patients to the hospital and book use of the hospital facilities on behalf of their patients. Even when administration is involved in managing all the departments that provide various treatment-related services, including diagnostic lab tests, they have little or no influence over clinical decisions for extensive diagnostic testing. By not being engaged in clinical decisions, hospital administrators are removed from direct responsibility for the cost effectiveness of patient care. As long as hospital expenses are recovered, the administrators have significant disincentives to interfere with physicians' professional autonomy. The hospital administration has a symbiotic-relationship with physicians. By having such a structural arrangement, both parties benefit: the administrators avoid clinical responsibility and the physicians maximize professional autonomy without administrative interference. In terms of cost control, the administrators are largely concerned with cost recovery. As long as cost is recovered (including cost of capital), more services and more tests are better for hospitals than less. In fact, increased volume of services rendered does not seem to be a

**EXHIBIT 1
MILLCREEK* HOSPITAL
ORGANIZATIONAL CHART**



Note: * The actual name of the hospital is changed.
 Solid line, "____," denotes direct control and accountability.
 Broken line, ".....," denotes indirect control with no direct accountability.

problem as long as the administrators appropriately screen patients for payment ability. Even for this screening of qualified patients, the administrators can rely on physicians to a certain extent.

In this traditional arrangement of hospital organizations, the critical uncertainty or the real strategic goal of profit-seeking hospitals is higher occupancy rate and more treatments, for which the administrators are critically dependent upon independent physicians. Since most of the high price-tag services are paid by a third party, typically an insurance company or the government, higher occupancy and more treatment is the implicit rule of the game for investor-owned hospitals. Hence, influence of administrators over medical professionals is limited. Thus, with an unaccountable relationship, cost management is of low importance to independent physicians (Glandon and Morrissey, 1986).

In Exhibit 1, the organization's control line for the administrative executive, (who tends to be more cost-conscious), is even thinner than the control line of the professional services executive, who has little or no incentive for cost containment. In fact, by having such a dual control system, each control line may deflect more troublesome cost issues to the other side.

The Medical Professionals

Physicians are professionally trained to effectively treat symptoms of injury and disease. Because of the need to minimize malpractice claims, physicians also have an incentive to over-provide the most comprehensive care in treatment of the patients' symptoms. It is frequently the case that ordering all tests is a safer defense than not doing some test, which can be a devastating fault in a court hearing. In addition, because of the physicians' customer status (independent contractor) and the dual control system, hospital administrators rarely make any attempt to curb the physicians' clinical autonomy. In such a context, with little or no incentive for cost effective diagnoses, medical professionals are less concerned with direct costs involved in treating particular symptoms of a disease.

For example, more than \$25 million is spent nationwide on tests to diagnose jaundice in newborn children. Newman, Easterling, Goldman, and Stevenson (1990) questioned the need for the whole battery of tests shown in Exhibit 2. According to these authors, a more cost effective way to diagnose jaundice in a newborn is to check the mother's medical history, do a thorough physical examination of the newborn, and check the initial hematocrit levels. Bilirubin tests and Reticulocyte count are of questionable value for jaundice evaluation. The fact that physicians routinely request the whole battery of tests lead us to believe that medical practice emphasizes the value of all diagnosing procedures more than the value of a patient's history and a thorough physical examination of the patient.

Given the present legal system and hospital/physician structural arrangement, physicians have little incentive to question the value of extensive diagnostic procedures. This is due to the high costs involved for not performing the procedures (*e.g.*, the costs of malpractice litigation and the damage to professional reputation). These approaches have become institutionalized in healthcare organizations.

EXHIBIT 2
CHARGES AT UCSF* FOR TESTS TO
EVALUATE JAUNDICE IN NEWBORNS

Tests	UCSF Charges
- Bilirubin	
Direct	\$19.75
Total	7.75
- Complete Blood Count	21.00
- Blood Type	12.00
- Blood Group	12.00
- Direct Coombs	25.00
- Reticulocyte Count	19.00
- Red Blood Cell	8.00
Total	<u>\$124.50</u>

Source: University of California, San Francisco, Medical Center. (Newman, B.T., J., Easterling, E.S. Goldman, and D.K. Stevenson, "Laboratory Evaluation of Jaundice in Newborns," *American Journal of Diagnosis*, No. 144, 1990, p. 364).

One way or another, patients are screened in terms of their ability to pay. Most of the prestigious physicians maintain a list of "financially qualified" patients. Hospital administrators are more concerned about the reputation of the physicians than about their style of practicing medicine. On the part of hospital administrators, recruiting outstanding physicians is a competitive process: a process that includes attracting physicians by offering state-of-the-art diagnostic and technical facilities. For physicians, maintaining their clinical reputation is far more important than delivering a "cost-control" reputation.

A hospital that has superior facilities and allows greater autonomy to physicians, has greater ability to attract physicians. In other words, in this arrangement, the important strategic concern of physicians is maintaining their professional, clinical reputation regardless of resources consumed. Clearly, cost control is a low priority to them. Quite naturally, as pointed out earlier, physicians thus gain power within healthcare organizations (*i.e.*, Critical contingency theory, Hinings *et al.*, 1974). This explains why the professional control line in Exhibit 1 is thicker than the administrative line.

Other Constituents: Lab Technicians, Nurses, and Patients

Lab clinicians are dependent on physicians' work orders. More tests mean keeping their lab open, and keeping technicians employed. The administration helps lab technicians operate in full or even expanded capacity. Frequently, the more rare and expensive tests accrue to the technicians' advantage, enhancing their professional experience opportunities.

In other words, lab technicians are also shielded from cost control incentives, and may not be structurally part of cost or price related decision activity for their services.

Nurses also have little control over the administrative as well as the clinical decisions. Little incentive exists for cost containment by nurses, as long as they comply with administrative policies and, more importantly, with physicians' instructions. In fact, because administrators may not pressure nurses for managing costs or clinical decisions, nurses are better off remaining neutral in their relationship with both administrators and physicians. Nurses function as employees of the hospital, providing services for the physicians.

Patients are concerned about the costs and bills they will receive. However, the uncertainty and complexity related to medical diagnosis and its implications for prognosis put patients largely at the mercy of healthcare professionals. As long as bills are predominantly reimbursed by a third party (the government or an insurance company), patients generally follow the instructions of physicians to maximize, presumably, the quality and benefits of medical services they receive.

Thus, in summary, in investor owned hospitals, physicians have a substantial amount of influence over the healthcare service delivery process. They are professionally independent from other constituents, including hospital administration and insurance companies. Physicians are primarily concerned with the delivery of medical services, rather than the cost effectiveness of the delivery process. Other constituents in this arrangement have neither the strategic interest nor the power to push for cost management.

Structural Arrangement in Not-For-Profit Hospitals and Cost Management

State-run hospitals and university-related hospitals are the two most prominent forms of not-for-profit hospitals (though not the greatest number). The strategic goal of state-run hospitals lies, formally at least, in providing medical services to all of the needy and qualified, within their budgetary constraints. Because of their budgetary constraint and large demand for services, it may be the case that all patients do not necessarily receive the same quality of service as in a for-profit hospital. Patients often need to wait longer for care. For some cases, these not-for-profit hospitals might actually be more cost-conscious because of their budgetary constraints and demand for services. But, this does not necessarily mean that they are operated on a more cost-effective basis. Cost can be kept within the budget by minimizing the total long-run amount of patient care provided during a given time period, without reducing the cost of patient care. As long as these not-for-profit hospitals can justify the cost incurred, they do not have to concern themselves quite as much about the quantity and quality of the treatments they provide over the long run.

University-related teaching hospitals are operated under largely the same cost principle as not-for-profit state-owned hospitals. Most of the services, including diagnostic lab tests, are reimbursed through a university-wide budgeting process. Educationally justified costs are reimbursed. Economical ways of conducting tests or screening what to test and what not to test (cost efficiency and cost effectiveness) is not a predominant principle. Rare tests and/or more expensive tests are preferred because of their instructional value. For instance,

in a case study we conducted in a university-related diagnostic lab, the hospital administrators seemed to be more concerned about the volume of tests performed than the cost efficiency and cost effectiveness of the tests. The critical uncertainty outside of the administrators' direct control was the steady flow of teaching subjects, *i.e.*, patients. Because of the stated goal of education, any cost incurred in providing clinical tests was easily justified. Exhibits 3 and 4 show the source of funds and the service price-cost comparison for the study we conducted. All the expense incurred in the lab was recovered, and the lab had a surplus: 81% from service fees and 25% from the college, leaving a 6% surplus.

One of the cost practices at this lab was as follows: their estimate for the budgeted level of service for a given year was set equal to the previous year's level of service. At the beginning of each year, the administrative staff conducted a physical count of inventories and placed orders for materials based on the last year's volume. No attempt was made to trace the materials cost of tests actually performed. However, the administrators marginalized the importance of material control based on the reasoning that materials used for these tests had little, if any, personal value to the technicians and would therefore not be subject to mismanagement. Furthermore, the technicians were allegedly under-paid compared to their counterparts in the industry, and hence, administrators seemed to believe that providing the technicians with maximum control of their work environment, with minimum interference, was one way to help retain good technicians. Thus, the administrators believed that tighter work scheduling and detailed cost control efforts would not contribute to the hospital's overall cost management efforts.

In spite of the above mentioned limitations, we sampled the work activities of the technicians. We calculated the cost of some tests that were frequently requested. From our calculations we found that three tests (out of 12 in our sample) did not even cover their own prime costs (materials and labor) (See Exhibit 4).

As far as these tests were concerned, the greater the need for these tests, the greater the need for funding. Without such cost information for activities (*i.e.*, tests), administrators did not know where to cut costs or how to require the physicians to evaluate costs and benefits of the tests. But, since there was little incentive for cost saving, expansion through increased expenditure, and consequently increased funding, when justifiable, served to promote the interests of several constituents.

Each party involved in this type of organizational arrangement will have disincentives to initiate a cost efficient and cost effective process for delivering healthcare service. Market economists suggest that not-for-profit institutions may not have the proper incentives to optimize their use of resources. They may be more concerned about the distribution of healthcare services within the community they serve.

In both state-run and university-related hospitals, medical professionals may use the hospital as a learning and experimental site. They may enhance their own professional experience or conduct research, putting cost at a lower priority. Thus, patients with a rare

EXHIBIT 3
SOURCE OF FUNDS FOR A
NOT-FOR-PROFIT DIAGNOSTIC LAB

Source of Funds	Amount	Percentage
Fee for Services	\$389,193.00	81%
Funds from College	<u>120,152.00</u>	<u>25</u>
Funds Available	\$509,345.00	106%
Total 91-92 Expenditure	<u>\$482,800.00</u>	<u>100</u>
Surplus	<u>26,545.00</u>	<u>+6%</u>

Source: Authors' research of a diagnostic lab; this lab is part of a university-related hospital function.

EXHIBIT 4
PRICE AND COST COMPARISON IN
THE DIAGNOSTIC LAB

Type of test	Volume	Revenue	Labor Cost	Prime Cost	Contribution (Loss)
Tests that are subsidized:					
AN-Antibody	520	\$10,400	\$27,560	\$31,874	(\$21,474)
Blood Gas	2,290	16,023	2,290	36,074	(20,052)
Blood Gas/Electrolytes	2,410	36,135	21,681	62,610	(26,475)
Sub-total					<u>(\$68,001)</u>

Source: Authors' research of a diagnostic lab; this lab is part of a university-related hospital function.

disease are welcomed even when costs for tests and treatments are usually high, since the patients need to be treated and the illness has high experience value.

New Organizational Arrangement and Cost Management

There are three key factors that we attempt to balance in order to offer an improved solution to the existing healthcare problems in the U.S.: to reduce the healthcare cost (cost

control) without lowering the quality of services (cost effectiveness) offered to the largest number of people who need the care (cost efficiency). The best mechanism that a capitalistic society has provided for balancing these factors for goods and services is the market pricing mechanism. In such a mechanism, over-priced services without comparable quality will lose out to competitors. However, it seems that U.S. political leaders do not want to allow free price competition for healthcare services for a number of important reasons.

First, the consumer seems to find it difficult to tolerate healthcare quality differentials based on price. In order to maintain "good" healthcare service and to train a qualified medical professional, it takes a substantial amount of time and resources. Because of the substantial idiosyncratic investment necessary, providers want to assume that quality is given. Also, since healthcare tends to be community-based, there may not be enough providers in each county—especially in rural areas—to drive down prices through free-market competition. In addition, there may be an overall loss of social welfare through the potential loss of important resources and technology if medical professionals and institutions fail due to unrestrained price competition.

Medical services provided today are also so complex in nature that it is not always easy for even the well informed consumer to determine quality differences. As a result of this information asymmetry, medical professionals attain more autonomy and discretion than other constituents in the healthcare industry. Ironically, it is this inability to accurately measure quality of care that makes curbing medical cost increases even more difficult. In the following section, we discuss some suggestions for a new structural arrangement to achieve a balance on these three important issues: cost reduction, cost effectiveness, and cost efficiency of services offered.

External Constraints

Beginning in 1983, many of the third party cost reimbursement agents, including many insurance companies and the U.S. government, adopted a method of payment called the Prospective Payment System (PPS). Under PPS, hospitals are paid a fixed fee per case based on Diagnostic Related Groups (DRG) and physicians are paid according to a Resource Based Relative Value Scale (RBRVS) fee schedule for their services. These mechanisms have proved to be effective in moderately curbing the rapidly escalating cost problem for healthcare services. However, physicians still have medical and financial incentives to do everything "beneficial" for patients, without inordinate concern about the costs involved. Since hospital administrators do not assume clinical responsibility, they thereby continue to encourage physicians to perform more tests and provide more services that provide greater chargeable volume usage of the hospital. Hospitals and physicians still maintain a symbiotic relationship in this regard.

As in the U.K., it seems that constraints outside of the healthcare industry are necessary for controlling costs and delivering healthcare in a cost effective manner. However, setting fixed prices for particular services alone may not direct the energies of medical professionals and institutions toward optimizing the three factors of providing quality service to the largest number of consumers at minimum prices. Hospital administrators and

physicians will still have an incentive to provide the largest volume of services, even at predetermined prices. Unlike the U.K. and Canada, where there are a single payor systems that ration the quantity of care by law, in the U.S. the multiple third party payor system encourages the delivery of the maximum amount of services, making it difficult to manage cost. It also implicitly rations care, but on the *ad hoc* basis of economic status, rather than through open public policy debate.

One way of balancing the three factors would be to consider a new organizational arrangement, putting administrators and physicians under one organizational structure. In Exhibit 1, this would be analogous to merging two control lines into one. This arrangement, establishing an employer-employee relationship, is not new to organizational theorists, though it may be quite radical to U.S. healthcare norms. It follows the traditional, product-line based hierarchical organization of profit seeking enterprises. The organization as a whole is responsible for services delivered to the market, and its success depends on market competitiveness. To remain competitive, quality should be the highest possible, prices should be the lowest possible, and hence, the production cost should be the lowest possible. All parties involved in the process, employers and employees, are responsible for optimizing the use of limited resources.

Health Maintenance Organizations (HMOs) and Preferred Provider Organizations (PPOs) have come close to adopting this model. They have shown some success in providing cost effective services without creating serious quality problems (Heintz and Mc Nerney, 1992). HMOs, as employers, effectively hire medical professionals as employees and put them in a traditional organizational hierarchy. It has been pointed out that under this arrangement, physicians' autonomy is substantially restricted (Glandon and Morrissey, 1986). Physicians are supervised to a greater degree by administrators. The increasing number of medical school graduates has enabled HMOs and PPOs to attract enough professionals to run such organizations. A prime objective of this arrangement is to align physicians' interest with the hospital's financial interest. In addition, the hospital as an organization shares clinical responsibility with the physician. Thus, in such an arrangement, all parties involved in providing healthcare services—hospital administrators, physicians, clinical technicians, and nurses—share both financial and clinical risks of providing care for the hospital's "portfolio" of patient care categories. This provides them with incentives to devote their energies and resources into concerted actions to achieve the agreed-upon goals for a particular group of patients. Cost effective care then becomes a more important strategic goal for the healthcare provider organization.

Internal Rearrangement

Under continued external pressure for cost control, traditional hospitals face the need for organizational rearrangement. The suggested arrangement of employer-employee relationship would put administrators and physicians in a more closely tied economic relationship in managing healthcare. Their collective efforts will be necessary to respond to changes imposed by the emerging national healthcare reform proposals. In other words, due to external organizational competition and shared financial interests, hospitals and physicians will have to work cooperatively to provide quality services at competitive prices, plainly disclosed for public scrutiny. In order to accomplish this as a common goal, both

administrators and physicians must first cooperate in rearranging the existing organizational structural relationships. Management budgets prepared by treatment categories and monitored by physicians would become a reality.

One such internal structural rearrangement would be to shift from a functional organization to a closely integrated "product" design. Since hospitals provide numerous services, many of which are inter-related in terms of the skills needed and equipment used for treatment, a "product" structure is a more appropriate form for grouping patient service efforts. In a "product" structure, similar services that require similar skills and equipment are grouped together in a unit, so that individuals can closely work together and be jointly accountable for outcomes.

An important feature of this "product" structure is its focus on building a team, which is collectively responsible for assessing market changes and meeting customers' needs. The team in the product line identifies target customer groups and provides preventative and comprehensive services to the target customers as a team. The team adjusts to changing needs of the target market segment: *e.g.*, the customers' demographic characteristics and their special needs, price sensitivities of the service, external payment schemes, and other external constraints. Furthermore, this product line management enables the hospital to better assess its ability and resources available to compete in the customer segment. The separate service units assesses whether the market they represent is appropriate and whether they can develop and provide a long-term competitive advantage to the consumer. Most importantly, this product line based structure serves as a profit center that is responsible for the cost-efficiency and marketable quality and volume of patient care services at competitive prices. Thus, both clinical and administrative responsibilities will be placed in the team that actually provides the services. Once appropriate service teams and support teams (cost centers) are established, costs of the support teams can be more meaningfully allocated to the service teams using accurate and detailed resource drivers.

It is a well established cost accounting principle that an appropriate mechanism for cost control is to establish a cost center or profit center, in which the head and all other subordinate members are personally responsible for the revenue generated and the cost incurred. In healthcare, the unit will also be responsible for clinical and quality decisions in the management of patient care. Thus, all the members in the unit make a conscious effort to control cost as well as to improve the quality and marketability of the services rendered. When a senior physician takes charge of a unit, which is likely in many clinical units, he or she will assume dual responsibility (clinical as well as administrative responsibility) of the unit. If a clinical decision requires intensive and interactive professional judgment, all the members in the unit will participate actively in the various clinical and administrative decision making processes. For example, a nursing director will have to work closely with in-charge physicians to meet the administratively set cost control goal for treatment diagnoses and drug related costs. These goals should be set so that they directly affect the remuneration of both physicians and nurses.

This arrangement is analogous to the product structure found in many service firms today. The head of each unit specializes in providing a particular type of service, such as

pension consulting, healthcare audits, personal taxes, estate taxes, business valuation services, to name only a few. The prices for these services are available in the external market or may be negotiated with the buyer. If the market price for a particular service does not cover its cost, then such a service may be contracted out to a lower-cost provider. The major improvement offered by this structure is that the services provided by a particular group of healthcare professionals are a product line of the hospital or provider organization. The role of external constituents such as government would be to facilitate establishment of reliable external market mechanisms for managing competition and requiring information disclosures of price, quality and efficiency as is currently being proposed in the Clinton administration's healthcare reform plan. This would be done for the majority of routine medical services provided by hospitals today. If establishing external market mechanisms for certain specialized services proves to be difficult, then direct rate regulation and subsidies are supplemental policy tools that may be brought to bear in order to ensure the continued provision of such services.

A Suggestion for Value Analysis of Activities

One of the important pre-conditions for cost control is that all the parties involved be aware of the significance of cost management to organizational strategic goals. External pressures, and internal structural rearrangement in response to these pressures, may create an environment in which cost accounting professionals can perform a systematic organizational intervention. This may help hospitals reduce intervention by outside interest groups. Unless such a structural rearrangement is made, any cost control attempt will be little more than an empty slogan, seen as a vehicle to justifying the costs already being incurred. When attempts to justify existing costs are strong, it will be more difficult for cost accountants to obtain meaningful cost information in any type of a zero-based sense.

When conditions are appropriate and all constituents agree with the need for controlling and managing costs, an ABC system will provide an effective cost control and management tool. An ABC system will require attempts to classify major activities in the healthcare delivery process into (more or less) value added activities. An activity based management system suggests to the organization to prioritize activities (*e.g.*, lab tests) based on their contribution to adding value in providing healthcare. Thereby, it is expected that costs can be reduced without lowering the quality of services provided. However, establishing such a system for a service industry like healthcare will not be easy. In the following section, we discuss the potential use of such a system for hospitals, and make suggestions for a conceptual framework of value analyses of activities in healthcare delivery processes.

Unit of Analysis

For cost control, it is important to identify a unit-cost center—and the person primarily responsible for the unit. At the macro-level, an organization as a whole can be a unit for which the CEO is responsible. Cost information of an organization can be examined and compared to observe overall value-added from year to year. Value added of a hospital can also be compared to the value added of similar hospitals to observe the hospital's relative standing in cost management when providing comparable care.

At the unit level, each relatively independent department can be a unit of analysis. The department heads will ultimately be responsible for the cost effectiveness of their units, given the allocated cost of the support units. Once a cost center is established, we can focus attention at a micro-level to measure the specific cost saving opportunities. The individual service-related activities of healthcare providers can be broken down on a cost/benefit basis to allow such a micro-level unit for cost analysis. Thus, an ABC accounting system attempts to come up with a list of major activities providers conduct in producing services so that the costs of these activities can be calculated accurately and more meaningfully.

Value Analysis of Activities

The most important task, once such cost related information has been gathered for all activities, is setting priorities: *i.e.*, what activities are more critical or value-added? In manufacturing organizations, ABC accountants trace the work flow and locate the value chain based on the strategic goals of the firm. They attempt to minimize the cost of internal processes that do not directly affect customer satisfaction. However, in hospitals, patients are an integral part of the service delivery process, and it is difficult to separate the input and through-put from the output. Therefore, there is a need for value judgments for each activity in relation to its potential benefits for diagnosing symptoms. These activities should be arranged in such a way that the more beneficial activities receive more support than the less beneficial activities.

In order to determine the degree of value added of each activity, the clinical and financial responsibilities of physicians and the hospital must be fused. As discussed, this fusion can be attained by a traditional product design structure. Technology can also play a role in saving cost by taking over routine, marginally beneficial activities that can be done in a less costly manner. For instance, in many hospitals, storing and retrieving patients' information have been replaced by an automated computer system, saving a tremendous amount on staff-related costs.

Guidelines for Value-Added Judgment

Value judgment of each and every activity is an important task for improving the cost effectiveness of an organization, and it is a crucial part of an ABC system. The following can serve as a guide for the value-added judgment of activities carried out in hospitals.

(1) Operational and Environmental Uncertainty

Activities that cope with higher uncertainty in a hospital should be considered to be more value-adding activities. Uncertainty can result from internal operation as well as from the external environment. If uncertainty is defined as not knowing of probable events and their causes, then not knowing what is going to happen in the market (*i.e.*, environmental uncertainty) is as much a problem as not knowing how to conduct activities internally (*i.e.*, operational uncertainty).

Operational uncertainty particularly comes from not knowing cause-and-effect relationships, and an ABC system can provide a means of modeling such relationships. Anyone who can effectively cope with uncertainties in an organization should be perceived to be more influential (Hinings, Hickson, Pennings and Schneck, 1974). Therefore, any

activity that is geared toward coping with the critical uncertainties of healthcare delivery processes should be considered to be more important, and hence, more value-added.

(2) Strategic Focus

A critical activity for achieving the strategic goal of a hospital should be considered to be a more value-added activity. Not all activities contribute equally to accomplishing the strategic objective of an organization. Some activities are more critically related to the strategic focus of an organization than others. It can be the case that different activities suddenly become more critical than previously due to a change in strategic focus. Teams that are more closely tied to such a new focus should command more resources. Once there is a list of activities available, it is theoretically possible to rank order the criticality of each activity for achieving an intended strategic goal. Since a change in a goal brings about a change in the level of criticality of an activity, it is important to examine any changes taking place both within and outside of an organization.

If a particular service is too expensive to obtain, even if it is critical for the strategic focus, the organization should seek an alternative source for that activity. If necessary, an organization should contract-out the services to a lower cost provider, rather than try to provide the services internally. Under the current arrangement, administrators may not make such decisions appropriately when they have reason to fear repercussions from losing patient volume to another agency or organization.

(3) Non-routine and non-substitutability

Non-routine and non-substitutable tasks should be considered to be more value-added than routine, substitutable tasks. Unlike an ABC system in the manufacturing sector, one must consider the concept of value-added in the service sector as a continuum, rather than as a dichotomy. Values added vary in degree on a continuum from less to more. Personnel with less training should handle the less value-added tasks, or a cost-effective automated system should take over such tasks. Technological advancement offers tremendous opportunities for cost saving. Non-routine, non-programmable tasks require more cognitive human judgment, more current information, and more extensive professional training. Frequently, these non-routine tasks contribute extensively to solving or reducing organizational uncertainties. Therefore, they should be perceived to be more important, and thus, more value-added than routine tasks.

These guidelines form the basis of our conceptual framework for value analysis in healthcare organizations. More detailed operational procedures for adoption of the system is needed and will be addressed in our future research. For discussion of the current structural arrangement for hospitals, we largely identify how difficult it is to design a meaningful cost control mechanism for cost management in hospitals.

Conclusion

In this paper, we examined the current structural arrangement of both for-profit and not-for-profit hospitals. For the most part, cost management is not currently a meaningful strategic goal in either type of hospital. Particularly, in for-profit hospitals, administrators and physicians have a symbiotic relationship: administrators provide the maximum

professional autonomy to physicians and physicians bring in patients. Strategic goals of the two parties have little to do with substantive cost control efforts. In state-run and university-related not-for-profit hospitals, the funding process does not appear to reinforce a policy of cost effective treatment of diseases. We contend that the current structural arrangement in the healthcare industry is not appropriate for reducing the costs of healthcare delivery processes. Instead, we suggested a stronger organizational tie between administrators and physicians in the hospital, such as an employer-employee type relationship found in HMOs that will align the financial and clinical stakes of both parties. Such an arrangement should better serve the needs of controlling costs and effective delivery of quality healthcare. We believe that the mounting reform pressures for optimizing cost and quality of healthcare can be met by an internal arrangement analogous to an integrated product line design. This would place all medical professionals, their support personnel, and administration personnel in a unified team. The team will be collectively responsible for managing the healthcare services and their costs, quality and profitability.

We also suggested a framework for value analysis. This framework offers a theoretical foundation that can be used to help hospitals develop an Activity Based Management system. The success of this system requires a pre-condition: the need for a meaningful structural rearrangement. Both external and internal pressures towards this structural rearrangement are necessary for this endeavor, so that all the constituents of a hospital will have the incentive to accept introduction of a substantive cost management system. In our perspective, current National healthcare reform advocates who recommend imposing more external pressures upon providers, not just regulatory pressures but more importantly, market and informational measurement and disclosure pressures, are addressing salient issues. Whether the legislative outcome of the reform process will be an improvement, or a setback, will be partly contingent upon the successful implementation of such control mechanisms.

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