



A Causal Model and Research Paradigm for Physicians as Leaders of Change

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At the University of Massachusetts Medical Center (UMMC), guiding organizational change has evolved into a key leadership-driven strategy. This organizational development strategy, which draws on individual and organizational learning to improve organizational performance, was developed from previous efforts to improve patient outcomes and to control costs. The framework for our organizational development efforts is based on the UMMC-Hay McBer Causal Leadership Model, which explains the effect of "independent healthcare organizational variables" (*ie*, climate) on the "dependent healthcare variables" (*ie*, finance and satisfaction).

The purpose of UMMC's collaboration with Hay McBer, an international management consulting company, is to conduct a 2-year research project to examine the relationships among leadership, organizational climate, patient satisfaction, and organizational performance at UMMC. These findings will serve as the basis for organizational change.

This article aims to describe the UMMC-Hay McBer Causal Leadership Model, to describe a validation study we have designed within the context of organizational development efforts at UMMC, and to describe the efforts and results to date.

Background

In 1991, UMMC implemented continuous quality improvement (CQI) initiatives, which were focused mainly on operational issues. Over the next few years, CQI evolved into clinical process redesign, an illness-based approach for improving the delivery of healthcare. This occurred in the context of major cost reduction and reengineering efforts that were initiated with the help of an outside consultant. These early efforts resulted in substantially reduced costs, streamlined processes, and improved quality-of-care outcomes. As a result of these efforts, UMMC has become a benchmark for other academic teaching hospitals regarding low cost per case, clinical outcomes, and high patient satisfaction.

Despite these accomplishments, senior leadership was not comfortable believing that UMMC could continue to compete in the long-term future. First, the evolving healthcare marketplace put new demands on UMMC to cut costs and become accountable for quality outcomes. Second, senior leadership began to recognize that the response of many physicians to the CQI and reengineering efforts was to find ways to satisfy administration while still trying to deliver quality care in the traditional ways in which they were trained. For example, senior administration traditionally used external, comparative financial data to help physicians, including those they had targeted as leaders, to identify performance improvement targets, such as cost per case, length-of-stay, and other measures of resource utilization. These data alone, although compelling, did not motivate successful change. Physicians did not accept the concept of fundamental change, nor did they understand that, for the organization to grow, they needed to lead the change.

Among the important issues grappled with were balancing short-term success with generating enthusiasm to implement fundamental change within the organizational culture. Approximately 70% of other organizations who had embarked on reengineering efforts had failed, owing to an inadequate emphasis on the importance of organizational climate and capacity. Senior administration further analyzed the reasons for the failure of the unsuccessful initiatives. They recognized failure could be attributed to physicians and other team leaders who did not have the leadership style and competencies to create an environment in which successful, sustained change could occur. They also recognized that physicians at UMMC had assumed traditional roles as clinical leaders. Physicians were primarily responsible for the clinical care of patients, and for all of the physician-dependent processes of care. The physicians had a relatively autonomous role, based on special knowledge and clinical expertise.

Senior leadership at UMMC thus came to the conclusion that, if UMMC were to achieve superior performance, physician leadership beyond the traditional clinical boundaries would be required. Specifically, physicians would need to become involved in organizational leadership. This necessitated a widespread culture shift to involve physicians as leaders. As UMMC's strategy evolved, the chief medical officer and the senior administration recognized the need for a conceptual model to form the basis of the major organizational development efforts.

The UMMC-Hay McBer Causal Leadership Model

Leadership of UMMC consulted with Hay McBer and together developed a conceptual model, referred to as the UMMC-Hay McBer Causal Leadership Model (Fig. 1). The model is based on the initial research of David McClelland and colleagues at the Harvard Business School [1] and Hay McBer and Company [2]. Their research, ongoing since the 1950s, indicates that successful leadership competencies and managerial styles produce motivating organizational climates, which arouse employee motivation to do work well, and which predict the desired organizational outcomes: exceptional customer satisfaction and financial performance.

The model fits the philosophy and vision for UMMC. The authors anticipate the model will provide a paradigm for helping physicians at UMMC understand their role and impact in guiding organizational change, and, in turn, will result in optimal patient outcomes and lower costs.

Figure 1 depicts the UMMC-Hay McBer model as a series of 13 variables, which includes eight independent healthcare organization variables, three patient moderator variables, and two dependent healthcare outcome variables linked in a causal flow. The model hypothesizes that the effects of process can predict outcomes. According to the model, independent healthcare organization (HCO) variables (Fig. 1; 1-8) will predict both patient moderator variables (Fig. 1; 9-11) and dependent healthcare outcome variables: financial organization performance (Fig. 1; 12) and satisfaction (Fig. 1; 13). In research terms, the model allows the organization to determine the statistical significance of the relationships among the variables in the model.

Leadership directly influences employees via competence and managerial style, and the cumulative effect of leader competencies and style plus resources is *organizational climate* (Fig. 1; 8), defined as employee perceptions that statistically correlate with or predict organizational outcomes, ie, customer satisfaction, financial performance, or satisfaction outcomes. High HCO organizational climate is likely to have a positive influence on patient encounters (Fig. 1; 9), which in turn predict clinical (Fig 1; 10) and patient satisfaction (Fig 1; 11) outcomes.

Leadership (Fig. 1; 1) can also identify (or encourage staff to identify) new resources, including variables two through seven: technologies (Fig. 1; 2), that can enable more efficient work-flow processes (Fig. 1; 3). Through work-flow processes, HCO leadership traditionally designs new jobs and roles to enable the organization to meet the rapidly changing demands of the marketplace and consumer. Job design (Fig. 1; 4) should follow work redesign for the same reason "form follows functions" in architecture; structures should facilitate efficient work processes. New work may require staffing (Fig. 1; 5), ie, hiring employees with new skills and competencies, or staff development (Fig. 1; 6), teaching existing staff new skills. The cumulative effect of resources is rewards (Fig. 1; 7), which, like competence and style, also directly affects climate.

In the next sections we define the key variables in each of the three domains in the model.

Healthcare organizational variables

Numerous studies [1-4] suggest that the behavior of immediate supervisors accounts for as much as 50% of employee climate or morale and that this climate in turn predicts organizational performance. The following section describes the model's visualization of this dynamic.

Organizational climate (Fig. 1; 8)

Organizational climate can be thought of as a pervasive atmosphere or environment that influences all organization members. Positive climate arouses employee motivation to do jobs well and to improve outcomes continuously for customers. Table 1 identifies and briefly describes six organizational climate dimensions in the Harvard Business School research [1] that predict organizational performance.

Leadership competencies and style (Fig. 1; 1)

A competency is "what outstanding performers do more often, in more situations, with better results, than average performers." In general terms, competencies can be thought of as a series of knowledge, skills, and behavioral attributes. Competencies have also been defined as "an underlying characteristic of an individual which is causally related to effective or superior (one standard deviation above the mean) performance in a job" [5,6]. In this model, we are also defining competencies as the underlying characteristics of an individual. Thus, competencies are criteria for differentiating job performance.

Clinical competence is achieved through education, research, and practice. However, being "clinically competent" does not make one a "competent organizational leader." Clinical expertise alone is not enough to thrive in the current healthcare environment. In the context of healthcare delivery, effective leaders clearly understand the difference between the two and are able to optimize the appropriate competency mix and style to ensure sustained change. Physicians are having to broaden their base to include the leadership side of medicine. Current research has identified certain physician leadership competencies that are linked to successful business practices [7].

Because leadership competence is not achieved the same way as clinical competence, physicians have to use approaches that are contrary to their academic training and counterintuitive to their thinking. We have found that when we first approach physicians and other leaders with the model and the concept of leadership competency, they immediately think of incompetency (their own or others'). It takes a lot of work to educate and demonstrate that the intent of understanding individual and team competencies is not necessarily to improve an individual's competency, but to have the team understand each other's strengths so they can team up or lead as a group more effectively.

Leadership style is the way in which a leader relates to employees and associates. The model indicates its relationship to organizational climate. Table 2 describes six leadership styles derived from research conducted at the Harvard Business School [1] that were found to be statistically significant predictors of organizational climate. According to this research, any one or all of the styles described in Table 2 are effective depending on attributes such as the characteristics of the situation, the experience of employees, the complexity of the task, the risk associated with deviations in performance, and the resources available.

In summary, independent research has shown that competency and style impact organizational climate, and that climate impacts performance. Additional research done for the American Society for Training and Development (ASTD) by the authors [Pelote V, DeWitt F. Paper presented at the ASTD International Conference Proceedings. New Orleans, 1992] links the previous research and found that organizational success was a direct result of climate, style, and competencies. The ASTD research found five competencies ([Table 3](#)) and three of six organizational climate variables ([Fig. 2](#)) that distinguished successful leaders of total quality efforts at high levels of statistical significance. Additionally, the research found there was a difference (although not statistically significant) for five of the six managerial styles ([Fig. 3](#)). This research was conducted in successful organizations that had been involved in quality techniques for more than 5 years. These successful organizations had been identified by a panel of experts using criteria such as the seven Malcolm Baldrige categories [8]. At the time of the research, the healthcare panel of experts felt no healthcare organizations met the criteria.

[Table 3](#), which is from the ASTD research, identifies the five competencies that differentiated successful performers in the study from average performers. It also shows the differentiating features of the two competency levels. [Figure 2](#) illustrates that the successful performers were higher than a comparison average-performing group in all the six organizational climate dimensions. Standards, clarity, and rewards were statistically significantly higher. Finally, [Figure 3](#) illustrates the five leadership styles in total quality management organizations that the successful performers were able to adapt based on the situation and task they each faced.

Patient Moderator Variables

Patient moderator variables ([Fig. 1; 9-11](#)) represents the summary effect that the organizational climate ([Fig. 1; 8](#)) has on the interface between the client-patient encounter and the dependent organizational variables. The restart of the client-patient encounter is measured in terms of clinical outcomes. [Figure 4](#) provides examples of unit- and population-based data, *eg*, readmission rates, infection rates, intermediate clinical outcomes (such as the rate of atrial fibrillation after coronary artery bypass graft), functional outcomes, and patient satisfaction.

Patient moderator variables affect the financial outcomes for the institution. Historically, HCOs were compensated based on the justification of services. This meant that the more the services provided, the more revenue was generated. Currently, healthcare revenue is based on quality outcomes, patient satisfaction, and efficient delivery of care.

These patient moderator criteria, which most third party payers use, are not as simple to understand as volume justification because they are much more sensitive to the independent organizational climate variables-leadership and resources. The model also provides a structure for clarifying and appropriately diagnosing the impact of the moderator variables on results (what the customers and payers value and reimburse for).

The first patient moderator variable is client-patient encounter. Some examples are

- Intake with the admitting clerk
- History and physical by physician or resident
- Orientation to the patient care unit
- Informed consent conversation
- Preoperative teaching with nursing staff
- Request for postoperative pain medication
- Discussion of plan of care
- Discharge instructions
- Physician instruction

The second patient moderator variable is clinical and functional outcomes. These outcomes measure the effect of treatment on a patient's disease state and his or her lifestyle. Examples include readmission rates, morbidity and mortality rates, ability to return to normal activities, and return to work.

The third patient moderator variable is patient and customer satisfaction. We based our variables in this domain on the Picker Commonwealth Survey [Picker Commonwealth Program for Patient-Centered Care, 9] dimensions of patient satisfaction. The seven dimensions in the survey are

- Respect for patient values, preferences, and expressed needs
- Coordination, integration, and information flow
- Information and education
- Physical comfort
- Emotional support and alleviation of fear and anxiety
- Involvement of family and friends
- Transition and continuity

Dependent Healthcare Outcome Variables

Financial results ([Fig 1; 12](#)) are outcomes that represent the summary effect of the independent and moderator variables such as market share, net revenue, and cost per unit.

Satisfaction results ([Fig. 1; 13](#)) represent the summary effect of the independent and moderator variables. They include turnover of critical staff, absenteeism, malpractice suits, and number of outside physician referrals.

An organization's financial bottom line, and the degree of satisfaction of its customers, are reliant on its patient encounters. Clinicians recognize that clinical and functional outcomes for the patient are the most important outcomes for the organization. This is not to be disputed, and clearly fits with a pure systems model of input, throughput, and output. The paradigm challenge is to focus on the

organization's capacity to deliver quality care as a throughput and not as an output. Thinking of patient care as a throughput is a key switch physicians need to make. The input then becomes the climate, the throughput is the client-patient encounter, and the output for the organization is the financial results and customer satisfaction. One way to understand this paradigm is to think of the model as representing the health of the organization.

The University of Massachusetts Medical Center Research Study

The goals of the UMMC research study, in collaboration with Hay McBer, are to

- Develop a predictive model of overall performance based on leadership and HCO-variable impact on the relationship of organizational climate, patient satisfaction, clinical outcomes, and healthcare financial and satisfaction outcomes.
- Develop a baseline understanding of the UMMC leadership competencies and organizational climate
- Develop strategies for improving UMMC leadership competencies and organizational climate
- Develop validated and reliable healthcare-specific tools to measure leadership competencies and organizational climate
- Test the validity of the UMMC-Hay McBer Causal Leadership Model

Using the UMMC-Hay McBer model as a conceptual foundation, we have progressed through the data collection process, and are currently testing the validity of the model. We are now in the data-analysis phase for the study variables. The steps involved in the study are described in the following sections.

Data collection

Hay McBer and UMMC are currently testing the validity of the model with a stratified sample of seven clinical services that were grouped into high- versus average-performing groups based on organizational performance criteria. These services include Hand Center services, cardiology, radiology, emergency services, pediatrics, gynecology, and psychiatry. We are using the data collection methods shown in [Figure 4](#), which highlights the data collection methods, sample groups, and variables examined in the study. The figure organizes these domains into the requisite organization-independent variables, and organization dependent variables, as described previously.

Instruments

Independent variable data (leadership competency and style, in addition to organizational climate data) are being collected using three types of survey instruments: the Hay McBer Healthcare Leadership Survey, the Hay McBer Organizational Climate Survey, and the Behavioral Event Interview (BEI).

A 360-degree questionnaire is used for the Hay McBer Healthcare Leadership Survey. Using the 360-degree leadership survey, leaders select two peers, two subordinates, their boss, and themselves to rate the leader's competencies and style.

The Healthcare Leadership Survey was developed by Hay McBer in collaboration with UMMC. The leadership survey has been reviewed by a panel of experts and refined by means of a modified Delphi technique for content validity. For the purpose of this study, coefficient α was the calculation used to establish reliability. The original questionnaire contained 252 multiple-choice questions. The second version was reduced to 79 multiple-choice questions by the use of cross validation with a comparison group.

The Hay McBer Organizational Climate Survey [10] is a questionnaire containing 14 multiple-choice questions, and is distributed to all employees whose departments are participating in the study. The original questionnaire was developed by Hay McBer in the 1950s and has established validity and reliability in industry ($r = 0.44$ to 0.85).

The Behavioral Event Interview is a structured interview process in which the interviewer asks respondents to describe critical success and failure incidents in their jobs in great short-story detail. In a question-and-answer format, the interviewer asks: "What led up to the situation"; "Who was involved"; "What did you think about, feel, or want to have happen in the situation"; "What did you do"; and "What was the outcome?" BEI transcripts are coded for competencies spontaneously described by interviewees. For example, if the interviewee states, "I wanted to improve...", the instrument coder translates this response to *achievement motivation* (expresses desire to do better). If the interviewee mentions customer satisfaction, the instrument coder translates this response to *customer-service orientation* (expresses desire to meet customer needs). If the interviewee says, "...so I implemented a patient triage response number and surveyed a sample of our patients on what we could do better...", the instrument coder translates this response to *initiative* (takes action not required by events).

We felt, based on previous research using the BEI, it would be one of three optimal instruments. For example, Cashman and Ott [Cashman D, Ott C, Paper presented at the Connecticut ASTD Conference on Competencies. Hartford, CT, 1996] found a high correlation ($r = 0.97$) between BEIs and staff competencies, as measured by the 360-degree questionnaire for a sample of 250 executives. High-potential and high-performing executives scored higher on 13 of 14 competencies measured, and competency scores predicted economic performance, as measured by CIGNA's Performance Assessment and Review system's bonus awards for business results achieved ($P < 0.01$). Jackson [Jackson D, Paper presented at the University of Western Ontario. London, Ontario, 1994] has reported a 360-degree rating correlation of 0.21 (self report), 0.40 (superiors), 0.54 (peers), 0.51 (subordinates), and 0.84 (combined scores) with senior executive performance. Preliminary data from the UMMC study support the findings of Jackson and Cashman.

Sample

The study sample includes UMMC staff employees ($n = 800$) for the Organizational Climate Survey and management-physician employees, *eg*, physician leaders and nursing directors-administrators ($n = 40$) for the Healthcare Leadership Survey. The Organizational Climate Survey was distributed in phases to all employees beginning in April 1996 and the employees were resurveyed at 6-month

intervals. The Healthcare Leadership Survey was distributed within the seven clinical services, as described earlier.

Statistical analyses

Correlation, regression, and path coefficient statistical analyses will be used to test the impact of leadership (Fig. 1; 1) and Healthcare system (Fig. 1; 2-7) variables on organizational climate (Fig. 1; 8), patient satisfaction and clinical outcomes (Fig. 1; 9-11), and HCO financial and satisfaction outcomes (Fig. 1; 12-13).

Implications of study results

Ultimately, findings about causal relationships among organizational predictor, patient outcome, and organizational outcome variables will be used to design diagnostic and prescriptive feedback data that physicians and other employees can use to plan changes that will improve overall performance. For example, individual profiles and comparison graphs will be used as educational feedback for physicians and other leaders to help them understand better the relationships among variables, compare their units' performance against those for high- and average-performing units, and compare individual versus team competencies.

Physicians as individuals and team leaders can use the data to develop the current team and also make better shared decisions regarding selecting new members for their service team. For example, with the loss of a key clinical leader, there is often anxiety over replacing the clinical expertise. Overlooked is an opportunity for the leadership team to reassess all variables in the model and determine if there are any competency gaps that should be recruited for. The clinical skills gap left by a vacancy are fairly obvious; however, competency gaps may not be so obvious. If recruitment focuses on only the clinical skills gap, an opportunity to improve organizational climate via competencies may be missed.

Other educational tools to be developed will be drill down graphs, which display participants' competency, managerial style, and organizational climate data in greater detail. Best practices and case studies of high-performing HCO units will be used to provide prescriptive guidance (first on paper, and later in an expert system) to help units close gaps to improve performance. For example, if a competency gap on influencing is detected, then the following actions will be suggested:

- Collaborate with individual based on competency strengths
- Survey management literature on negotiation
- Participate in group work
- Take a course or workshop on influencing

Organizational leaders should never be satisfied with excellent patient or financial outcomes without examining the organizational climate. If clinical or financial outcomes are strong but organizational climate is unhealthy, then the organization should be concerned because probably more resources are being expended than need be, or employees are working harder than they should. Even with positive financial results, if organizational climate is unhealthy, the organization will at some point have to question its priorities.

Conclusions

In this article, we have described a model of leadership as a way to guide change in HCOs. In the course of this project, we have learned several valuable lessons at UMMC:

- *The model and methodology need to be linked to an overall purpose and other organizational strategies.* Effective change models only work when they make sense to the individuals who have to change. The model will make sense only to those who are involved in a change process or who feel the need to change. The practical application of the model is the most important.
- *The methodology should be introduced in phases.* The most difficult and frustrating thing about implementing the model is that individual clinical services can only change as fast as the organization permits. Without a reason for the change, understanding and implementation of the model will proceed at a much slower rate. Once staff and leaders begin implementing change at any level, or see the need for change, they become excited about the model because it adds clarity and efficiency to existing chaos.
- *Leaders (clinicians) have much more influence on organizational climate than they realize, and they have traditionally not considered its importance.* This becomes a double jeopardy because the climate and, ultimately, organizational performance will not change until this understanding begins. The challenge has been to pull (self-discovery) rather than push (train) clinicians to understand that the organizational climate drives the clinical and financial outcomes and that they impact the climate. This has to be done in a number of different ways, depending on the physicians' and leaders' personal methods of absorbing new knowledge.

We have found, based on our initial work with the seven clinical services at UMMC, the UMMC-Hay McBer Causal Leadership Model and the applied results of our project have empowered physician clinicians to use the information in new and proactive ways. We anticipate the model and methodology will continue to enhance their awareness of the competencies and leadership style necessary to effect organizational change.

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