MANAGED HEALTHCARE INSIGHTS℠

Thought Leaders Tackle Today's Issues

NUMBER SIX IN A SERIES

Health Care Quality Means Business

Based on a conference in Philadelphia on Oct. 11, 2002

Presented by Wharton Health Care Management Alumni Association

Continuing education credit for pharmacists and physicians sponsored by The Chatham Institute, Chatham, N.J.

SPECIAL SUPPLEMENT TO
MANAGED Care
January 2003
Vol. 12, Number 1

Managed Markets Group
TAP Pharmaceuticals Inc.

THE CHATHAM INSTITUTE

Health Care Quality Means Business
CONTINUING EDUCATION SECTION

Course description

This activity is designed to educate health care executives about current viewpoints on how to optimize the quality of health care. The authors discuss quality from a host of vantage points, highlighting important ways to increase effectiveness while reducing costs of various treatment approaches.

Educational needs assessment

Medical and pharmacy directors are seeking treatment approaches that offer the highest quality of care while maximizing cost efficiency. To improve the quality of care that is being delivered within their organizations and practices, these health care professionals want to be kept informed of the most current and effective ways that their organizations can meet patients' needs. The content of this supplement has been compiled based on faculty perceptions of significant trends or issues in health care.

Target audience

Medical and pharmacy directors for managed health care organizations and physicians and pharmacists.

Educational objectives

After reading this publication, the participant should be able to:

- Discuss the importance of initiating quantifiable measures to improve the quality of care from the purchaser's perspective.
- Highlight the elements of the current crisis in the medical malpractice insurance market in Pennsylvania.
- Explain why the legal system is not a good measure of provider quality, and evaluate steps that can help end the malpractice insurance crisis.
- Summarize the dynamics surrounding physician adoption of new technologies.
- Describe a four-stage market model based on the theory of inflection points for ascertaining the current state of a health care entity's patient-safety program.
- Elucidate the connection between quality of the health care workforce and clinical quality.
- Delineate steps taken by Abington Memorial Hospital, in Pennsylvania, to improve a health care system using technology to reduce medical errors.

Methodology

Lectures

Continuing medical education accreditation

This activity has been planned and implemented in accordance with the Essentials and Standards of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of The Chatham Institute and of MediMedia USA.

The Chatham Institute, for a period of one (1) year from the date of this release, designates this continuing medical education activity for two (2) credit hours in category 1 of the Physician's Recognition Award of the American Medical Association, provided it is used as completed and designated. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

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Release date: January 2003

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ACPE program number: 812-000-02-004-H04
Expiration date: Jan. 31, 2004

Planning committee members

Arnold Henning Seto, MSc, PharmD, Scientific Director, The Chatham Institute; Tamar Small, Executive Director, The Chatham Institute; Timothy P. Search, RPh, Group Publisher, Managed Care, a division of MediMedia USA Inc.

Conflict-of-interest policy in continuing medical education

In compliance with this policy, the faculty for this activity has disclosed financial interests, arrangements, and/or affiliations with corporate organizations offering financial support or educational grants for continuing medical education activities, as well as those organizations with direct interest in the subject matter of this activity.

Disclosures of significant relationships

The faculty members involved in this program have declared that they have no financial interest, arrangement, or affiliation that would constitute a conflict of interest concerning this CME activity.

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This special supplement is supported by an unrestricted educational grant from TAP Pharmaceuticals.

The opinions expressed herein are those of the participants and faculty, and do not necessarily reflect the views of MediMedia USA Inc., or the publisher, editor, or editorial board of MANAGED CARE.

INTRODUCTION AND OVERVIEW

Health Care Quality Means Business

In this sixth installment of the "Managed Healthcare Insights℠" series, derived from the Wharton Health Care Management Alumni Association conference in Philadelphia on Oct. 11, 2002, a distinguished faculty addresses the business case for quality health care. Fueled by the recent Institute of Medicine report estimating up to 98,000 preventable medical errors annually in American hospitals, the quest to heighten the quality of health care has captured the attention of patients, employers, and providers, triggering changes that, ultimately, will redefine the nature of health care in this country. Within these pages, 10 experts address the issue of quality health care from a host of vantage points, outlining effective methods to eliminate waste and reduce costs while improving patient safety.

Bruce Bradley, director of health plan strategy and public policy at General Motors and a founding member of the Leapfrog Group, describes the hospital safety initiatives that 115 major purchasers of health care are using to reduce waste, inappropriate care, and inaccurate prescribing. Pennsylvania's malpractice insurance crisis is highlighted in an article by C. Mitchell Goldman, Esq., and Thomas Gaudiosi, CEO of Pennsylvania Health Care Providers Insurance Exchange, who outline effective ways to bring stability back to the marketplace. Lillee Gelinas, RSN, MSN, chief nursing officer and vice president at VHA Inc., looks at the effects that severe shortages in the health care workforce are having on quality of clinical care. John Kelly, MD, explains how technological advances are being used to significantly reduce medical errors at Abington Memorial Hospital, where he is chief patient safety officer.

Technological advancements also are boosting patient education efforts significantly. According to David Shulkin, MD, the educated consumer will place new demands on providers, who must adapt to this growing trend or "risk extinction." Barry P. Chaiken, MD, MPH, vice president of medical affairs at McKesson Corp., and Richard Fiedotin, founder of ePocrates, focus on the critical role of technology in reducing medical errors and improving quality. Robert J. Blyskal, executive vice president at Medco Health Solutions, shares innovative approaches that plan sponsors and pharmacy benefit managers can use to ensure that medications remain both accessible and affordable to those who need them.

David Nash, MD, director, office of health policy and clinical outcomes at Thomas Jefferson University Hospital, concludes with a candid and insightful analysis of the substantial challenges that may impede progress toward improvement and the success that is possible when sound business approaches are strategically applied to efforts to improve quality of care.

PART I

QUALITY: THE PURCHASER'S PERSPECTIVE

Quality Initiatives

BRUCE BRADLEY
Director of Health Plan Strategy and Public Policy, General Motors Health Care Initiatives, Detroit
Former Chair and Founding Member, Leapfrog Group

Major purchasers of health care, such as General Motors, have taken the initiative to improve health care quality, reduce waste and inappropriate care in the delivery system, and encourage the appropriate use of prescription drugs. The widely disseminated Institute of Medicine 1999 report, which estimated up to 98,000 preventable deaths annually in U.S. hospitals (Kohn 1999), triggered greater awareness of the business case for health care quality. It also increased public recognition and strengthened the momentum of the work begun by the Leapfrog Group. Since forming the Leapfrog Group, more than 120 large purchasers, including GM, have adopted three safety initiatives for their assessment of hospitals: the use of computerized physician order entry (CPOE), intensivist management of intensive care units, and evidence-based referrals. These initiatives have had quantifiable results. At present, other quality-improvement initiatives are under consideration.

When a major health care purchaser, such as General Motors, wants the quality of its health plans to improve, those plans respond. In terms of sheer numbers, General Motors covers 1.2 million employees, retirees, and their families, with more than twice as many retirees as active employees in its plans. The company spends about $4.2 billion per year on health benefits; $1.3 billion is spent on prescription drugs, with average annual drug-cost increases ranging from 15 percent to 20 percent.

From the purchaser's perspective, the quality of the health plans with which General Motors contracts is only as good as the product provided by those plans.

It is extremely difficult for any company competing in the global marketplace to continue to absorb double-digit increases in health care costs annually, while the price environment does not permit it to pass health care cost increases to its customers (Figure 1).

Quality and safety

A health plan provider is a supplier to General Motors. In the ideal relationship, suppliers and purchasers work hand-in-hand to keep costs down and provide a quality product. General Motors is making a concerted effort to focus on the quality and safety of the health plans that serve its beneficiaries. To do this, the company has identified three significant issues to address:

- Heightening patient safety and quality-improvement efforts through public disclosure and consumer information
- Reducing waste and inappropriate care in the delivery system using decision-support tools and other process improvements
- Encouraging the appropriate use of prescription drugs

Simply, GM wants beneficiaries to enroll in the highest-quality, best-performing health plans, because that is where the true benefit lies. People with significant medical care needs are not going to enroll in health plans without the assurance that they will be receiving good care. If GM can meet its employees' needs by providing them with access to the best care-delivery systems, the economic savings will be substantial.

Conversely, the costs of poor quality are also significant:

- The Midwest Business Group on Health says that the cost of poor quality accounts for 30 percent of all health care expenditures (MBGH 2002).
- Every diabetic patient should receive an HbA_{1c} test (NCQA 1999), but only 41 percent of GM employees in its database who have diabetes receive it, with a range by community of 17 to 55 percent.
- The hysterectomy rate in one large community was 80 percent higher than in the Kaiser Permanente system. Among GM beneficiaries, there is significant variability in hysterectomy rates across communities.
- Of the prescriptions for antibiotics recorded in GM's database of self-funded plans, 60 percent are prescribed inappropriately.

Health plan value

As vendors that supply General Motors with an essential service, health plans must act as GM's agents in managing health care delivery. Employees, their dependents, and retirees look to GM to deliver good health care programs and to the health plans to deliver good service.

The health plans bring added value only if they can do the following: offer sound benefit-plan design, ensure access to qualified providers at reasonable cost, measure clinical and functional outcomes, and provide feedback on patient satisfaction (Figure 2).

GM's overriding strategy with regard to its health plans is to reward the better plans based on performance quality. The first step in improving quality and safety is to request that the largest (top 11) plans bring in their clinical leadership to work with management to share best practices. Sharing best practices is the true beginning of the solution, because it improves quality. Specifically, management has focused on best practices in the areas of disease management, prescription drugs, and patient safety.

To disseminate information, GM conducts a quality evaluation of each health plan using a scoring algorithm. Plans are scored from

FIGURE 1 The Purchaser's Perspective

Increases in health insurance premiums compared to other indicators, 1997–2001

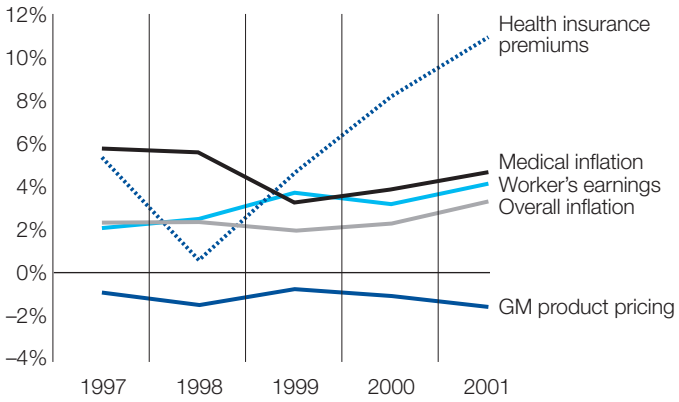
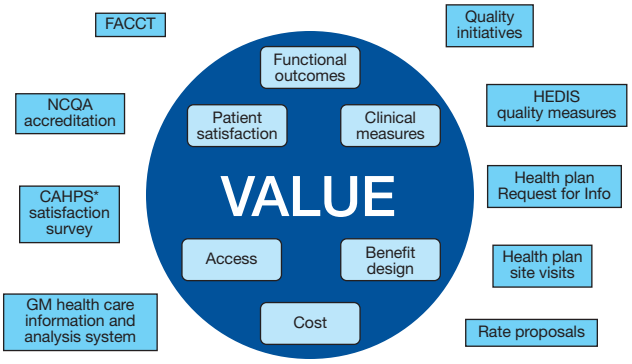


FIGURE 2 Health Plan Value Measurement

Tools to measure elements of value



*Consumer Assessment Health Plan Survey

1 to 50, based on their performance on quality. For example, the company can do side-by-side comparisons of HMOs, ranking them on total quality and total quality plus cost. The GM managed care team ranks all of its HMOs, from the best to the worst, based on these scores. Then, it places them in tiers: the best plans, strong, good, average, fair, and poor. From that, GM calculates how much money to collect in the aggregate from salaried employees and retirees, through payroll deductions, to contribute toward the cost of health care premiums.

Instead of the traditional way in which employers determine a payroll deduction, GM bases it on the health plan's score or tier, so that the benchmark (top-rated) HMO is offered to employees at the least cost. This creates a significant financial incentive for a beneficiary to enroll in a higher-quality plan.

Management then implements a pricing ladder. The benchmark HMOs cost the employee substantially less than those that do not score as well; for instance, the monthly payroll deduction for a family enrolled in the benchmark plan is $38. For a plan with a 'poor' ranking, the same family would contribute $204 per month.

General Motors combines this pricing ladder with a report card that uses stars to rank plans. This is essentially a consumer guide, based on pertinent data from the National Committee for Quality Assurance (NCQA), NCQA's Health Plan Employer Data and Information Set (HEDIS), The Foundation for Accountability, and others. The benchmark HMOs usually receive many stars for quality, while the below-average HMOs receive fewer stars. This system gives employees a basis for making intelligent decisions about health plan quality, juxtaposed with the cost element previously described.

As a result of this system, there has been a massive migration from poorly performing health plans to the better-performing ones. More importantly, some health plans have improved in the rankings. Ultimately, that is the goal — to raise the bar and get improvement in health care services from the plans.

GM views this as a win-win-win-lose scenario. The three winners are the health plans, which achieve market-share growth; the company, from an economic standpoint, because half the equation still is the cost of the plan; and the employees, who save money. The losers are health plans that either lose market share or are dropped due to poor-quality performance.

Serious illness

One significant challenge in health care is properly aligning the financial incentives for a health plan that does an outstanding job of caring for people with serious illness. In a capitated environment (in which a plan is paid on a per-capita basis to provide a fixed benefit package to each enrollee), the insurer could encounter financial hardship resulting from adverse selection. For example, despite the fact that one particular HMO has one of the best AIDS programs in the country, a large influx of AIDS patients to that plan would hurt it financially due to high utilization.

General Motors wants its beneficiaries with significant medical needs to enroll in benchmark plans when they are available, not in unmanaged indemnity plans. The current insurance-based system, however, makes it more attractive for a health plan to focus on underwriting than on marketing its performance level relative to the provision of care to the seriously or chronically ill.

To address this problem, GM conducted an experiment that has been extremely successful. The University of Michigan faculty practice, along with Integrated Health Associates, an Ann Arbor, Mich., physician group practice, performed an in-depth evaluation and had lengthy discussions with GM about using evidence-based medicine to serve its older beneficiaries with chronic diseases. Rather than pay high-quality plans by capitation — which hurts them financially as a result of adverse selection — GM developed a prenegotiated fee schedule for the care of these individuals. In addition, GM pays the plans an added amount for each of the disease management programs. The company offers bonuses for performance measures, such as the percentage of eligible members who enroll in a disease management program, the existence of a care-management plan, and high patient satisfaction.

General Motors has a voluntary risk appraisal as part of its Lifesteps health promotion and prevention program. The University of Michigan stratified GM employees by health status — high risk, medium risk, and low risk. As a result of participation in various programs, a significant number of employees have moved from high risk to medium risk, and from medium risk to low risk during the course of a number of years.

Examining the per-member, per-year cost of care for individuals in each of these levels, GM found that it is much more expensive to care for someone in the higher-risk categories. The net result is GM saves money by moving people to the lower-risk categories. This movement has not paid for the program, but it is directionally correct and is extremely encouraging.

Prescription drugs

The cost of prescription drugs presents a significant challenge to purchasers. GM spent $1.3 billion in 2001 for prescription drugs, a large increase over the previous year. Drug manufacturers justify higher drug costs and utilization by pointing out that these factors reduce expenditures in other areas of health care, such as hospitalization. While this is true for specific drugs in specific circumstances, this does not reflect GM's experience overall. Hospital costs have far exceeded inflation.

Prescription drug companies take advantage of an imperfect market, and though this benefits their stockholders, this is problematic for their paying customers. There is very little relationship between who pays and who is accountable. There are a number of issues that GM's full-time clinical pharmacists and economists are attempting to address to deal with the cost of prescription drugs:

- Our increase in expenditures for drugs is somewhat less than other payers but not sustainable.
- Drugs are GM's fastest-growing cost component for health care or any other expenditure of its magnitude, with 15-percent to 20-percent annual increases.
- Hospital, surgical, and medical costs have not declined as drug expenditures have increased.

TABLE 1 Controlling Prescription Drug Costs

GM initiatives
• Using a pharmacy network
• Promoting use of generics
• Working with drug manufacturers
• Educating enrollees and physicians
• Optimizing dosing
• Cost sharing/plan design
• Increasing use of mail order
• Using Internet-interactive voice system
• Working with three auto companies on initiatives
• Using interactive point-of-care technology
• Advocating legislation: generic reform, Medicare

As indicated in Table 1, which appears on page 4, General Motors has a number of initiatives in place to control spending on prescription drugs.

Leapfrog Group

The Leapfrog Group is made up of more than 120 large employer purchasers of health care, and includes the United States Office of Personnel Management, the Department of Defense, and the Center for Medicare and Medicaid Services as "liaison members." Today, Leapfrog represents organizations that purchase more than $55 billion in health care a year for more than 32 million Americans.

Leapfrog gives the purchasers' perspective on health care. The amount employers and employees spend on health care in this country far surpasses per-capita spending in the rest of the world. Yet, looking at many measures of performance, the United States is in the lower quartile when compared to many European nations.

From the purchaser's perspective, health plan/provider mergers, poor performance improvement, poor clinical-information systems, the lack of a business case for high-quality care, and scattered fiduciary responsibility have not added much value to the system.

All these problems contributed to gridlock in the system. The purchasers were not purchasing health care benefits in a way that was cost effective, and the plans were not letting provider value show through. Providers were not seeing the business case for reengineering to improve care, and consumers and patients were not in the quality game. GM and other Leapfrog purchasers realized that new thinking was needed to "leapfrog" the resulting gridlock, which was impeding improvement in the health care system.

Leapfrog is not focused solely on the business case for high-quality care; it is also about saving lives. The widely disseminated Institute of Medicine (IOM) report generated awareness among purchasers of about the relationship between the business of health care and health care quality.

Using the IOM figure of 98,000 deaths due to preventable medical errors, GM can estimate the effect on the company. At the time of the IOM report, the U.S. population was approximately 275 million. That translates to approximately 39 preventable deaths per 100,000. GM covers 1.25 million lives, which means that there are 488 unnecessary deaths annually — or between 1 and 2 preventable deaths daily — among those covered under the GM program.

For General Motors, this is not an academic exercise. GM has, as its highest priority, a focus on safety. The company monitors employee safety in its plants and has driven the number of accidents down considerably. To GM, it is unacceptable to lose one or two people every day from preventable medical errors.

The fact that there are 39 preventable deaths per 100,000 underscores the importance of forming the Leapfrog Group. Essentially, purchasers like General Motors got together and said, "We ought to make sure that we buy value in health care. We have a huge problem with patient safety that we have to address."

A leap forward

The full Leapfrog mission is to try to drive a leap forward in health care quality, customer service, and affordability. Accomplishing this depends on making the American public aware of quality issues, and training employers to buy value when purchasing health care benefits. By establishing a set of purchasing principles that place high regard on value, the purchasing community — which contributed initially to part of the problem — can be an important part of the solution.

An important part of the purchasing decision is how to reward better performance. During health plan contract negotiations, a health plan's quality and its cost-effectiveness performance are taken into consideration. Performance is communicated to employees and retirees. GM works with its plans on improvement, and those that perform poorly without demonstrating significant improvement are dropped.

Leapfrog purchasers recognize health plans in several ways:

- Commend and support better-performing plans, e.g., by awarding a "blue ribbon" designation
- Giving consumers economic incentives
- Offering consumers decision support, such as easily accessible and understandable performance comparisons (Leapfrog Group 2002a).
- Creating economic incentives for providers

Leapfrog is emphasizing three initial measurable safety initiatives (Table 2), or "safety leaps," that affirmatively address these questions:

- Does implementation of the initiative make a difference?
- Can you easily see the measure?
- Is the initiative feasible?
- Is another entity already implementing the initiative?
- Are data readily obtainable so that you will not have to conduct large research projects?

The three safety leaps in Table 2 were selected because of the existence of strong evidence to support their implementation.

For instance, the argument for CPOE is based on work at Brigham and Women's Hospital in Boston. When the hospital installed a CPOE system for all prescription drugs, it required physicians to use it if they were to practice in the hospital. Implementing CPOE initially reduced serious medication errors by 55 percent.

Brigham and Women's Hospital has now reduced potential medication errors by 84 percent as a result of CPOE. That success has been replicated in many hospitals throughout the country (Bates 1998).

General Motors informs its employees when certain hospitals have implemented CPOE. Implicit in this message is that the probability of an employee becoming the victim of a serious medication error at a hospital using CPOE is greatly reduced. Thus, CPOE is used as a tool to improve patient safety.

TABLE 2 Safety Leap Summary

Outcomes that argue for implementation
An Rx for Rx
Computerized physician order entry
• *Up to 8 in 10 serious drug errors prevented*
Sick people need special care
ICU daytime staffing with critical-care physician *or* risk-adjusted outcomes comparison
• *>10% mortality reduction*
Practice makes perfect
Evidence-based hospital referral *or* risk-adjusted outcomes comparison
• *>30% mortality reduction for 7 complex treatments*

TABLE 3 Evidence-Based Hospital Referrals

Evidence-based hospital referral	
Coronary artery bypass graft	>500/yr
Coronary angioplasty	>400/yr
Abdominal aortic aneurysm	>30/yr
Carotid endarterectomy	>100/yr
Esophageal cancer surgery	>7/yr
Expected birth weight	>1500 g
or gestation	<32 wks
Regional NICU census	>15
Delivery with prenatal diagnoses of major congenital anomalies	
Regional NICU census	>15

The second safety initiative — one that has, probably, the greatest impact on saving lives — is the focus on intensive care unit (ICU) care. Hospitals with ICUs, staffed full-time by intensivists (rather than attending physicians), reduce mortality. For example, Peter Pronovost, MD, an intensivist at the Johns Hopkins Medical Institutions, studied hospital mortality rates after abdominal aneurysm repair in Maryland. Surgical mortality was 21 percent in hospitals without intensivist-model ICUs, compared with 7 percent in hospitals with them (Leapfrog Group 2001). In addition, hospital mortality rates for abdominal aortic surgery varied widely, from 0 percent to 66 percent, in a study of 46 Maryland hospitals that performed such surgery (Pronovost 1999).

The third safety initiative is the use of evidence-based hospital referrals for certain procedures. There is a relationship between volume and outcomes, as hospitals that perform certain procedures, such as coronary artery bypass graft surgery, have better patient outcomes. In a systematic review of 272 studies on volume and outcomes, 71 percent of all studies of hospital volume and 69 percent of studies of physician volume reported statistically significant associations (Halm 2002).

Table 3 lists the seven procedures for which evidence is compelling regarding a link between higher volume and better outcomes.

The tenet that higher volume leads to better outcomes is based on the strongest published evidence there is. It would be preferable to consider risk-adjusted outcomes and communicate them to employees, because volume does not reflect the entire story with respect to improving outcomes. The Society of Thoracic Surgeons, for instance, contributes data to a database and shares information on how to improve outcomes. General Motors and other large purchasers want to support efforts such as these.

Making it happen

How do health care purchasers drive quality improvement and help to ensure patient safety? Purchasers expect hospitals to report their performance data and respond to the Leapfrog Group Hospital Patient Safety Survey (Leapfrog Group 2002b).

Leapfrog surveyed 485 urban hospitals in six regions — Atlanta, California, East Tennessee, Minnesota, St. Louis, and Seattle — with a response rate of 54 percent. As of November 2002, 5 percent of the hospitals had a fully implemented CPOE system. When a comparison is drawn between health care and the banking and airline industries, health care lags in implementing technology standards. An additional 25 percent of hospitals surveyed have a detailed commitment in the capital budget, so that by 2004 they will have CPOE (Leapfrog Group 2002c). This is encouraging, and it suggests that a well-thought-out, evidenced-based proposal for the use of CPOE has been debated and implemented.

The Leapfrog survey results on ICU staffing reveal that 21 percent of responding hospitals have intensivist-staffed ICUs, while an additional 16 percent have specific plans to implement them (Leapfrog Group 2002c). The biggest issue herein is training enough intensivist physicians to meet ICU staffing needs.

Leapfrog is interested in hospital input to help make the business case for safety and quality in health care. This is a start; purchasers must develop additional safety leaps and are looking at an ambulatory measure relating to clinical-decision support.

Roles in the health care system

To move patient-safety and quality-improvement efforts forward, everyone in the health care system will have to play a role, especially physicians. Doctors must become familiar with evidence-based medicine, practice shared decision making, and help purchasers develop additional safety leaps. Health plans need to educate members and to work closely with hospitals at plan-renewal time. To be considered top-tier units, health plans need to meet the company's performance expectations.

Consumers will play a greater role. Consumers need to be more fully engaged and informed. GM wants to use its employees and retirees as leverage to improve quality. Consumers can recognize that medical mistakes are frequent and serious, educate themselves about providers, and learn how their choices can be significant. Additionally, they can make their expectations known to their providers.

Leapfrog members can have a significant impact. Leapfrog is a national movement working in targeted regions to develop best practices, create early successes, and learn from stakeholders. Each region must have effective leadership, a competitive health care market, and a concentration of Leapfrog lives. Initially Leapfrog began its work in seven regions. Now, it has 19 regions, representing 70 percent of the American population. In time, these numbers will increase.

At Leapfrog, there are committees known as "lily pads" that support its work. There is tremendous outreach to physicians, health plans, and hospitals to encourage them to develop incentives that support the business case for higher-quality health care. It is clear that Leapfrog is having an effect, and that an even greater one can be achieved if its three safety leaps are implemented. Some 522,000 serious medication errors can be avoided annually by implementing CPOE, 2,581 lives can be saved during five high-risk

procedures, and 53,850 deaths can be avoided each year through the implementation of closed ICU physician staffing (Birkmeyer 2000).

Leapfrog is one small step for all of us, one giant leap for patient safety. Together with the types of initiatives that GM has implemented, the Leapfrog Group demonstrates the purchaser's desire to move toward quality, cost-effective care.

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PART II

PROVIDERS' OPPORTUNITIES FOR QUALITY IMPROVEMENT

Focus on the Health Care Workforce

LILLEE GELINAS, RN, MSN
Vice President, Chief Nursing Officer, VHA Inc., Irving, Texas

The quality of clinical care is linked directly to the quality of the health care workforce. There is ample evidence in the literature supporting this link (Aiken 2002). Yet many health care executives still view workforce and quality issues separately. Improving clinical quality will remain difficult until the health care system addresses the issues surrounding staffing shortfalls. There are not enough health care workers to accommodate the needs of patients today (Table 4), much less tomorrow.

The American Hospital Association recently estimated that 168,000 hospital positions are vacant, 75 percent of which are positions for registered nurses (AHA 2001). Vacancies for RNs have been reported by 89 percent of surveyed hospitals; for radiological technicians, 76 percent; pharmacists, 67 percent; lab technicians, 54 percent; billers/coders, 48 percent. Such vacancies among skilled staff can result not only in quality-of-care issues, but also in poor service quality that is reflected in the loss of patients to other organizations — which translates into lost revenue and lost market share.

TABLE 4 Hospital Job Vacancy Rates

Position	Rate (%)
Imaging technicians	15.3
RNs	13.0
LPNs	12.9
Pharmacists	12.7
Nursing assistants	12.0
Laboratory technicians	9.5
Billers/coders	8.5
Information technologists	5.7
Housekeeping/maintenance	5.3

SOURCE: Report commissioned by American Hospital Association, Association of American Medical Colleges, National Association of Public Hospitals and Health Systems, and Federation of American Hospitals, 2001

In addition to VHA Inc., which was once known as Voluntary Hospitals of America Inc., other organizations, such as the Joint Commission on Accreditation of Healthcare Organizations, have studied these shortages (JCAHO 2002, AHA 2002). All these organizations have determined that today's workforce issues arise for multiple reasons. Fewer people have been entering health care professions in recent years because careers in health care are perceived to be less attractive than they once were, and other sectors of the economy appear to offer greater opportunities for career satisfaction, compensation, and advancement. In addition, the hospital workforce is aging along with the rest of the United States population. The average age of nurses and laboratory professionals is about 46, and most radiological technicians are over the age of 40. When workers in these fields retire, few are waiting to take their place.

Further, many young people who do enter the health professions leave quickly. In many organizations, the turnover rate for registered nurses with tenure of 1 to 3 years is 47 percent to 55 percent if they are between 20 and 30 years old. For these reasons, the competition for talent is increasing. Sign-on bonuses have become the norm in many markets. For example, a hospital in Pensacola, Fla., recently offered a $12,000 referral bonus along with a $12,000 sign-on bonus, which could result in a $24,000 windfall for a couple if an employee could induce his or her spouse to join the organization. A $30,000 sign-on bonus is not uncommon for nurses in intensive care units. Yet, offering bonuses of this magnitude is not a sustainable business model for health care.

By 2010, it is predicted that there will be 10 million more jobs than people available to fill them (Figure 3). A shortfall of 1 million nurses is predicted by 2010; by 2015, the shortage could reach 1.5 million.

The impact of workforce shortages will be felt in terms of emergency department overcrowding, delayed discharges, increased waiting times for surgery, reduced number of beds, and curtailed plans for facility expansion (Figure 4).

Today's and tomorrow's workforce shortages stem from a massive system failure. During the last 10 years, an impending crisis has been building in the health care workforce. Cultures of cost-cutting have been dominant, rather than cultures of retention. This situation has been exacerbated by organizational structures that segregate workforce strategies, patient safety, and patient-experience initiatives into separate areas with separate leadership. In fact,

these activities must be connected to achieve optimal outcomes and to devise new models of care.

A new book published by the JCAHO, *Frontline of Defense: The Role of Nurses in Preventing Sentinel Events*, establishes the direct link between quality and outcomes. The impact of the workforce challenge on organizational and clinical performance cannot be ignored. Strong links must be forged between patient experience, patient safety, and workforce strategies to develop new models of care, because today's care-delivery system is flawed. It is unaffordable and unsafe. Workers are not attracted to it, and consumers dislike it.

To assure the best care for every patient every day. and to recruit and retain quality workers, health care organizations must be on the proactive, positive side of change. VHA Inc. is pursuing initiatives in this area. VHA is a member-owned and member-driven health care cooperative comprising 2,200 health care organizations and their affiliated physicians. VHA members represent 20 percent of all United States hospitals and generate 30 percent of all United States hospital-based revenue. The VHA network also includes 29 percent of the registered nurses employed in the United States.

A VHA initiative known as "Tomorrow's Work Force" allows some conclusions to be drawn about clinical improvement and workforce initiatives. Its database includes 32,000 employees from 57 VHA institutions that are working with VHA to become Employers of Choice in their markets and to improve quality of care through workforce initiatives. Through the Tomorrow's Work Force database, VHA has found that departing staff members most commonly cite dissatisfaction with the work environments, their relationships with their managers, and staff relations as their reasons for leaving. VHA has also found that the biggest predictor of quality for patients, employees, and physicians is work efficiency.

Through the Tomorrow's Work Force initiative, VHA helps its organizations to concentrate on five activities:

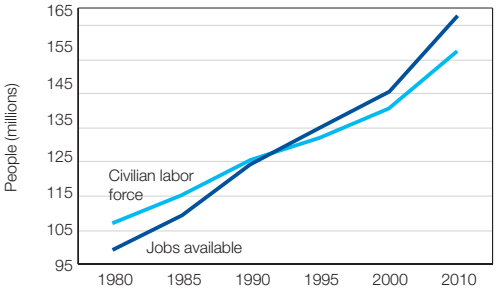
- *Developing a strong leadership platform*. Leaders of health care organizations are instrumental in instituting a specific set of values, driving focus, and assuring ongoing leadership development at all levels.
- *Building a healthy culture*. A competent employee base starts with establishment of a healthy corporate culture that is evident throughout an organization.
- *Designing work for staff satisfaction and optimal care*. This determines how individual roles within an organization affect work flow, labor costs, and job satisfaction.
- *Creating effective human resource processes*. Efficient human resources processes, including a contemporary benefits package and strong retention programs, enhances an organization's recruiting potential.
- *Growing the next generation*. Potential employees need to be made aware of the tangible and intangible rewards of careers in health care.

Impact of employee turnover

Health care organizations incur costs whenever a new employee must be recruited and trained. In a hypothetical model depicting typical turnover of the staff in a 180-bed hospital, the annual re-

FIGURE 3 Workforce Shortage

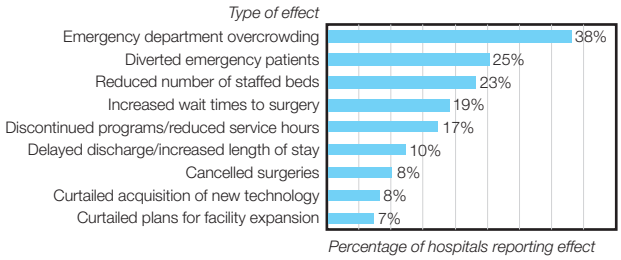
Not enough people to fill jobs



SOURCE: Olivo 2002

FIGURE 4 Effect on Health Care Services

Impact of the workplace shortage



SOURCE: First Consulting Group: "The Healthcare Workforce Shortage and Its Implications for America's Hospitals," 2001

TABLE 5 Human Capital Replacement Costs for Skilled Staff Positions at a 180-Bed Hospital

Position	Number of employees	Avg. annual compensation	Total compensation for facility	Mean vacancy rate	Turnover rate	Employees replaced per year	Replacement factor	Replacement cost	Total
Pharmacists	13	$58,000	$754,000	12.7%	15%	2	75%	$43,500	$84,825
LPNs	80	$32,000	$2,560,000	12.9%	25%	20	65%	$20,800	$416,000
RNs	240	$50,000	$12,000,000	13.0%	25%	60	100%	$50,000	$3,000,000
Billers/ coders	25	$22,000	$550,000	8.5%	50%	13	30%	$6,600	$82,500
Nursing assistants	45	$18,000	$810,000	12.0%	50%	23	30%	$5,400	$121,500
Lab technicians	20	$34,000	$680,000	15.3%	50%	10	35%	$11,900	$119,000
Imaging technicians	28	$44,000	$1,232,000	15.3%	50%	14	40%	$17,600	$246,400
Totals	**451**		**$18,586,000**		**31%**	**141**			**$4,070,225**

SOURCE: Gelinas 2002

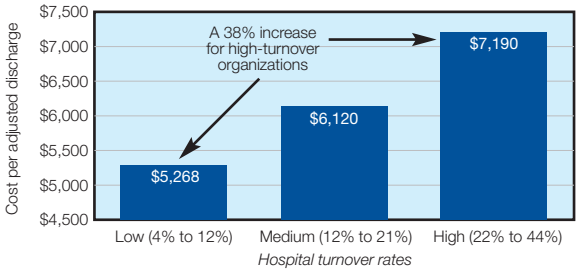
placement cost for 141 employees is $4 million (Table 5, page 7). In this scenario, replacement costs amount to 22 percent of average base compensation for the group. If the turnover rate is reduced from 31 percent to 25 percent, the hospital saves $814,000 annually; reducing the turnover rate to 20 percent would result in annual savings of $1.4 million.

Many hospital administrators maintain that current reimbursement models do not support fully funding quality initiatives, such as installing a computer system for medication error reduction. VHA Inc. data suggest the opposite — that hospitals cannot afford not to institute quality initiatives that reduce their employee turnover rate and create a positive work environment.

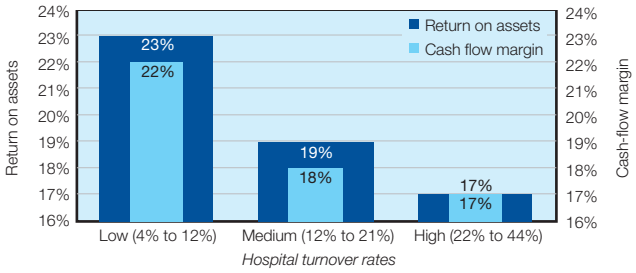
In a survey involving 235 VHA hospitals (each with ≥200 beds) and 385,000 employees, the cost per adjusted discharge was 36 percent higher at institutions with high employee turnover (22–44 percent) than it was at institutions with low turnover (4–12 percent) (Figure 5a). Likewise, return on assets and cash-flow margins declined as turnover rates increased (Figure 5b). At hospitals with low-turnover rates, the return on assets was 23 percent, while the return on assets at hospitals with high-turnover rates was 17 percent.

FIGURES 5a, 5b, 5c
Total Impact of Employee Turnover

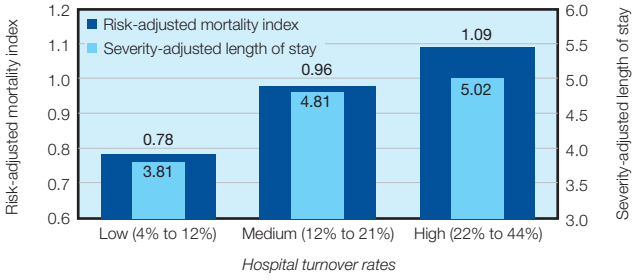
The relationship between employee turnover in health care and cost per adjusted discharge



The relationship between employee turnover and profitability



The relationship between employee turnover and patient care



SOURCE: VHA Inc., 2002

Finally, a direct relationship also was observed between employee turnover and morbidity and mortality (Figure 5c). In low-turnover organizations, the risk-adjusted mortality index was 0.78, compared with an index of 1.09 at hospitals with a high-turnover rate. The severity-adjusted average length of stay in low-turnover hospitals was 1.2 days less than in high-turnover hospitals.

VHA Inc. data also suggest that an investment in retention initiatives results in lower employee turnover. In 1999, an average of $521 per employee was spent on workforce retention activities, mostly in training and education, and the turnover rate for full-time employees was 18.3 percent. In 2000, when retention spending dropped to $485 per employee, the turnover rate increased to 19.6 percent. In 2001, when per-employee retention spending increased to $603, the turnover rate dropped to 16.2 percent.

Data like these contribute to the business case for workforce stability. Health care organizations that understand how to connect effectively with caregivers — as well as those that can show how to integrate patient experience, patient safety, and workforce strategies — will improve clinical performance, develop new models of care, and attain the goal of providing the best care for every patient every day. Patients deserve nothing less.

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Sustaining Safety and High Quality in Health Care

JOHN J. KELLY, MD, MBA
Chair, Dept. of Medicine; Chief Patient Safety Officer, Abington Memorial Hospital, Abington, Pa.

The biggest challenge to health care during the next 5 years will be to sustain safety and quality in an environment of constrained resources, characterized by increasing costs, declining reimbursement, and the increasing difficulty in recruiting and retaining high-quality staff. In this environment, the desired outcomes of safety-improvement initiatives will be safer care, better care, decreased costs, and a diminished risk of malpractice, both as a tension in daily life and as a cost to the system.

The pursuit of improved patient safety is a worthy goal in its own right, but it also is a sound business strategy for health care organizations. It may be regarded as a commitment to excellence via continuous process improvement. Opportunities for safety improvements abound, from the sentinel events identified by the Joint Commission on Accreditation of Healthcare Organizations to evidence-based medicine, patient suggestions, root-cause analyses, and alerts from extramural organizations such as the Leapfrog Group and the Agency for Healthcare Research and Quality.

This article describes steps taken by Abington Memorial Hospital, a teaching hospital in Pennsylvania, to build a better and safer health care system by harnessing the power of computers to reduce medical errors.

Heeding a wake-up call

In late 1999, the Institute of Medicine (IOM) issued a report concluding that flawed systems and work processes — as opposed to negligent individuals — were responsible for most of the medical errors that make health care in the United States less safe than it should be (Kohn 1999).

The IOM report constituted a wake-up call to everyone involved in health care, and certainly to the lay and business communities. By heeding the call and reducing medical errors, health care organizations can reduce their costs — along with the personal pain experienced by patients and personnel involved in health care errors.

The IOM estimated that preventable medical errors in hospitals were responsible for between 44,000 and 98,000 deaths each year, with the lower estimate exceeding the number of deaths attributable to motor vehicle accidents, breast cancer, or AIDS. Using the lower estimate, if deaths from preventable medical errors are listed among the leading causes of death in the United States, they would rank eighth. The IOM also noted that adverse drug events (ADEs) are a major cause of morbidity: medication errors were estimated to have accounted for about 7,000 deaths in 1993 — more than those due to workplace injuries.

In a study of 15,000 nonpsychiatric discharges from hospitals in Utah and Colorado during 1992, adverse events were found in 2.9 percent of hospitalizations (Thomas 2000). The rate of adverse events was the same in each state. (It should be noted that not all adverse events are preventable, but in the future, more adverse events will become preventable as knowledge is acquired about their precipitating circumstances.) Death occurred in 6.6 percent of all adverse events and in 8.8 percent of negligent adverse events. The leading cause of nonoperative adverse events was ADEs, which accounted for 19.3 percent of all adverse events.

ADEs occur at all stages of the medication process. In one study (Bates 1995), ADEs occurred at a rate of 6.5 per 100 nonobstetrical hospital admissions. Twenty-eight percent of these ADEs were regarded as preventable. Forty-nine percent of all ADEs occurred at the ordering stage, 26 percent during administration, 14 percent during dispensing, and 11 percent at the transcription stage. Among the ADEs resulting from errors (i.e., preventable ADEs), 56 percent and 34 percent occurred during the ordering and administration stages, respectively, while only 6 percent and 4 percent occurred during transcription and dispensing.

TABLE 6 Medication Error Rates

Category	% (n)
Omission	6 (183)
Wrong dose	3 (103)
Unauthorized drug	1 (22)
Wrong form	1 (20)
Extra dose	<1 (10)
Wrong route	<1 (6)
Wrong technique	<1 (2)
Wrong time	8 (259)
Total errors	**19 (605)**
No error	81 (2611)
Total doses	100 (3216)

SOURCE: Barker 2002

In a study of 36 health care institutions in Colorado and Georgia (accredited and nonaccredited hospitals and skilled nursing facilities), 19 percent (605 of 3216) of medication doses were found to be in error. Errors were categorized as shown in Table 6.

About half of these errors involved the delivery of the medication at the wrong time (>60 minutes before or after the scheduled administration time, or >30 minutes for medications ordered in the case of administration before, with, or after a meal). Seven percent of the errors were judged to be potentially clinically significant.

Preventable ADEs are associated with substantial costs. At the 700-bed Brigham and Women's Hospital, the annual cost of preventable ADEs was estimated at $2.8 million — half of the $5.6 million attributable to all ADEs at that institution (Bates 1997).

Challenges facing health care organizations and a technological solution

In the aftermath of the IOM report and accounts in the news media, health care organizations face multiple challenges. They must regain patients' respect, which can be done by delivering timely, appropriate care. They must regain patients' trust, by demonstrating that the health care system will not harm them. They must reassure employers and insurers, who expect to receive value for the money they put into the health care system; payers know that if fewer dollars need to be diverted to the management of medical errors, health care costs will decrease. Finally, health care organizations must demonstrate that health care is equitable, providing appropriate care without waste, so that resources will be available in the future for patients who need them.

Computerized physician order entry (CPOE) provides a tool for reducing ADEs at all stages of the medication process, not just in prescribing. At Brigham and Women's Hospital, CPOE reduced serious medication errors by 55 percent (from 10.7 to 4.86 events per 1,000 patient-days) (Bates 1998).

Abington Memorial Hospital, a 508-bed teaching hospital in Pennsylvania, installed a CPOE system in 1993, at a cost of $5 million. Initially, CPOE was not mandatory, but in the wake of the IOM report, Abington required universal CPOE to prevent adverse events and improve patients' safety. At the time this decision was made, about 45 percent of orders were entered via computer. Personnel were given 1 year to adapt to CPOE, and in January 2001, all order sheets were removed from the hospital. All staff members now are obligated by the medical staff rules and regulations to use the computer to enter all orders, which number 252,000 per month.

Currently, 85 percent of all orders (and 98 percent of all medication orders) are entered via computer. The percentage is not higher because Abington does not have web-based technology yet, so that physicians who need to issue orders from home must do so orally. Neither has Abington (or any institution) been able to develop a system for using CPOE in the operating theater. Otherwise, those elsewhere in Abington Memorial must use CPOE.

CPOE has been found to offer many advantages at Abington. It has facilitated faster medication delivery, for example, reducing by two-thirds the time it takes for an antibiotic to be received by a patient after it has been ordered. Allergy calls have decreased by 50 percent, because the system incorporates automatic allergy checking. Hospital formulary calls to correct physician orders have decreased by 41 percent.

Initially, a few patients received, or almost received, the wrong drug because an order could be placed from anywhere in the hospital. This problem was corrected by providing the physician with a computer confirmation screen containing detailed information

about the patient and requiring the physician to verify that the patient selected is the one for whom the drug is intended. Some physicians have complained about this extra step, but Abington Memorial has had no further incidents involving inadvertent selection of patients since this safety measure was implemented.

Focusing on warfarin

At Abington Memorial, computer technology also has been marshalled to reduce morbidity associated with the anticoagulation agent warfarin, which may be the most dangerous drug employed on a general basis in the United States. Warfarin has a very narrow therapeutic range. It is important for the patient not to be under-anticoagulated, because no positive results will be achieved, and it is important for the patient not to be over-anticoagulated, or the patient will be at an increased risk of bleeding.

Warfarin presents a substantial target for achieving reductions in morbidity, because it is being used increasingly for a wide variety of indications and has become the second most common cause of ADE-related admissions. Nevertheless, a recent study by investigators at Temple University suggests that 95 percent of the ADEs associated with warfarin may be preventable (McDonnell 2002).

Abington Memorial recently introduced a Web-based system, webINR, to help physicians manage their patients on warfarin, whether in the hospital or in the community. This system provides real-time feedback to physicians, identifying patients who are over or under their therapeutic range or who are past their stop dates. (There is a recommended length of therapy for many conditions.) Currently available to six physician practices in Abington's community, the system soon will be extended to 35 offices and 100 physicians. When a physician logs on, a list of patients on warfarin is displayed, along with each patient's date of birth and international normalized ratio (INR), a test of blood thinning. The physician can view the last 10 INRs for a particular patient, the daily doses of warfarin that generated the INR, the patient's indication, target range, and the dose calculated for the coming week via calculators integrated into the software.

The warfarin system also serves as an educational resource. Physicians can view a decision-tree algorithm, and they can take a competency test. They also can acquire information about food and vitamin interactions, and this information can be printed for use by the patient.

Finally, the warfarin data for a group of physicians can be viewed online by an administrator or supervisor, and the information can be used to promote better practice within the group. When the Abington warfarin program was implemented, only 50 percent of patients were within their therapeutic range, but now 70 percent to 80 percent of patients are in range. These results impressed a nationally recognized warfarin expert when he visited Abington, because the best result he could achieve at his warfarin clinic was to have slightly more than 80 percent of patients in range.

Eliminating variations in patient care presents a pressing challenge for health care organizations. This is especially true in light of the virtually impossible task required for an individual to stay current with the exponential rise in the volume and complexity of medical information, the limited ability of someone to recall that information at the point of care, and a tendency to use information in a biased fashion due to the influence of external forces (e.g., pharmaceutical detailing). Therefore, the next initiative at Abington Memorial will be to provide physicians with computerized decision support. The traditional model of treating patients with a given disease one by one is associated with unexplainable variations in care, errors of commission, and a high opportunity for errors of omission. Complementing CPOE with decision support and order sets will create an opportunity to bring evidence-based treatment to a group of patients with a given health issue. Decision support can be extended into the community, where 90 percent of care takes place. For errors to be kept to the bare minimum, evidence-based medicine must be brought to the point of care.

As an example of how this system could reduce errors, if a physician attempts to order a contrast study for a patient whose medication list contains metformin, the decision-support system would detect a contraindication and send the physician the following message: "Intravenous contrast with iodinated materials can lead to acute alteration in renal function and result in lactic acidosis in patients taking metformin. Metformin should be held 48 hours before the procedure and resumed only after renal function has been reevaluated." The order for the contrast study would be blocked, and the physician would be required to acknowledge receipt of the alert.

Conclusion

Through their allocation of substantial resources to support safety initiatives, the administration and medical staff leadership at Abington Memorial have issued a clear signal that they are creating a culture in which safety is a fundamental value and a daily relentless pursuit. Most, if not all, hospitals can follow this model.

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Part III

The Malpractice Insurance and Quality Conundrum

C. MITCHELL GOLDMAN, Esq.
Partner, Duane Morris LLP, Philadelphia

THOMAS S. GAUDIOSI, CEO, Pennsylvania Healthcare Providers Insurance Exchange, an affiliate of Duane Morris LLP, Philadelphia

The medical malpractice insurance market in Pennsylvania is in crisis, with physicians facing double-digit premium increases each year and insurers leaving the state. This article defines the nature of the crisis, focuses on factors that have made it particularly acute in Pennsylvania, discusses why the legal system is not a good measure of provider quality, and suggests changes that are necessary to address the crisis.

Defining the problem

There is a critical difference between a medical malpractice crisis and a medical malpractice insurance crisis. Pennsylvania faces the latter. The crisis can best be described as one of insurance affordability and availability. The annual malpractice premium for a family physician in the state has risen from $5,000 in 1998 to more than $13,000 in 2002, for the first $500,000 of coverage. A catastrophic loss fund provides an additional $1 million in coverage (Tillinghast/TowersPerrin 2002).

Premiums for surgeons and other specialists are much higher. Nearly 13 percent of the state's Ob/Gyns have stopped delivering babies because they can no longer afford liability insurance, and more than 80 percent of orthopedic surgeons surveyed in April 2001 said that the malpractice premium crisis makes them want to leave Pennsylvania (Vanett 2001). A group of neurosurgeons relocated, rather than pay $350,000 each for malpractice coverage. The group generated an average of $1,500 per procedure, and performed 150 to 200 procedures each per year, producing a gross revenue of $225,000 to $300,000.

Why a crisis?

Several factors contributed to the medical malpractice insurance crisis in Pennsylvania. Intense competition between insurers led some to set unrealistically low premium rates. Customer loyalty to a carrier declined as physicians switched their coverage, in large numbers, to the company with the cheapest premium. The number of malpractice claims surged beyond levels anticipated by insurers. Poor experience led several key insurers to leave the state, declining to write new business or declaring insolvency. The Pennsylvania legislature unsuccessfully attempted to enact meaningful tort reform. Finally, the decline in stock market performance was also a significant contributing factor in the crisis.

Competition/pricing. In the mid-1990s, approximately 15 liability insurance carriers competed to provide malpractice coverage to Pennsylvania physicians. To gain business, some insurers extensively engaged in a premium-setting practice colloquially known as "diving for the bottom." This involves offering economically unsustainable premium rates to attract business. The expectation was that, in a 3-year period, the company would gain enough market share to raise its prices and recoup losses. In one egregious example, an insurer that was new to the state offered a neurosurgeon with an extensive claims history a 50-percent premium reduction, while other insurers considered this surgeon to be uninsurable or subject to a premium surcharge. This predatory pricing strategy weakened even the strongest, A-rated carriers. While heavily regulated by the Pennsylvania Department of Insurance, it was the policy of the Department to encourage competition rather than assure carrier solvency. Unregulated competition drove many of the companies out of business or out of the state.

Of the 15 carriers operating in the mid-'90s, only two remain — the Pennsylvania Medical Society Liability Insurance Company (PMSLIC) and The Medical Protective Co. PMSLIC, founded during a previous medical malpractice insurance crisis, in 1976, by the Pennsylvania Medical Society and now an affiliate of NORCAL Mutual Insurance Co., is not writing new policies. Medical Protective, founded in 1899 and now a unit of General Electric, is writing new policies on a limited basis. Physicians unable to get coverage from either company must turn to the Joint Underwriting Association, which is viewed as the carrier of last resort. JUA enrollment is at an all-time high, in part because physicians with as few as one or two malpractice claims are determined to be bad risks.

Other factors contributing to poor insurer financial performance were the product-line and geographic-diversification strategies employed by many carriers. A number of carriers chose to go into new geographic markets or to underwrite hospitals or nursing homes. For example, MIIX, a New Jersey insurer, expanded into the Pennsylvania physician market. While its New Jersey book of business had always been profitable, it was the poor Pennsylvania experience that drove MIIX out of Pennsylvania and ultimately brought down the New Jersey company. Even at the time MIIX went out of business, its New Jersey business was profitable. MIIX recently started a new company in New Jersey for physicians.

Lack of customer loyalty. Attracted by lower premiums, physicians switched insurers in large numbers. In many cases, they did so without a due-diligence examination of the lower-priced insurer's viability. Physicians did not appreciate the risk of insurance company insolvency and their insurance advisors did not adequately prepare the physicians for the risks they were assuming. Now, physicians insured by defunct insurance companies are struggling to ensure that their cases are being handled and that no gap in coverage exists. In addition, every physician who purchased a claims-made policy — one that requires that tail coverage be purchased when a policy expires — found that their defunct insurer either could not provide a tail policy or that the price could be as much as three times the expiring premium. The price of "buying cheap" has left many physicians with either inadequate or very expensive coverage.

Unpredicted claims surge. The volume of malpractice claims filed in Pennsylvania has increased dramatically in recent years, as have the dollar amounts of jury awards in malpractice cases. According to the National Association of Insurance Commissioners, Pennsylvania ranks second in the nation, behind New York, in total malpractice payouts (Benfield Blanch 2002). In three cases in 2000, Pennsylvania juries ordered defendants in medical malpractice cases — and thus their insurers — to pay awards of between $100 million and $250 million. More recent information from the state suggests that jury awards may have peaked. As physicians leave the state, public sentiment may be shifting away from large awards.

A more focused examination would indicate that Philadelphia has the worst experience of all the counties. Compounding the problem, plaintiffs' lawyers have been successful in finding ways to bring cases that have occurred in other parts of Pennsylvania into the Philadelphia courts. The Pennsylvania legislature has recently enacted new legislation prohibiting this type of forum shopping. The reason for the surge in claims, meanwhile, is unknown. Some argue that it is reflective of a quality problem resulting from serious staffing cutbacks and a nursing shortage in Pennsylvania hospitals. Others claim that the claims increase is due to trial lawyers abusing the legal system that could easily be remedied by tort reform. There are insufficient data to determine whether the spike in claims is a short-term event — which many insurance analysts contend — or a long-term trend.

Lack of meaningful tort reform. Last year, physicians and hospitals had high expectations that, given the scope and seriousness of the malpractice insurance crisis, the Pennsylvania legislature would pass meaningful tort reform — a legislative mandate to put a cap on all damages to be awarded to a victim of physician or hospital malpractice. Most tort-reform legislation focuses on limiting awards for pain and suffering as well as punitive damages. While "meaningful" might be defined differently by physicians, insurers, trial lawyers, and consumers, we define it to mean a legislative package that includes provisions that, when implemented, would encourage commercial insurance companies to return to the state. For this to happen, insurers need confidence that the market is stable and that the cost of paying claims is predictable. The reforms enacted by the legislature did not address the surge in the severity of claims. Rather, the political leadership could not find an effective policy consensus among the key constituencies — insurers, physicians, hospitals, and trial lawyers. The problems of availability and affordability have not been solved.

Stock market declines compound problem. As a result of the factors described above, liability insurers sustained heavy losses in Pennsylvania, as measured by insurers' combined loss ratio. Combined loss ratio is calculated by adding indemnity payments paid, indemnity payments reserved, claims expenses paid, and claims expenses reserved. This figure is divided by the premium collected. This ratio measures the profitability of the insurers business. A combined ratio in excess of 100 means that for every $1 collected in premiums, an insurer will spend more than a dollar of premium in indemnity and claims expenses. In essence, that line of business is operating at a loss. When investment income is high from a strong economy and stock market, as it was during much of the 1990s, companies can absorb a combined ratio in excess of 100 and still maintain an expected return on capital (Moore 2001).

Typically, medical malpractice insurers can break even when running between a 115 percent and 120 percent combined loss ratio. From 1997 to 1999, the average physician professional liability insurer in the United States saw their combined loss ratio increase from 114 percent to 129 percent (Gallagher, Houston). During that same period in Pennsylvania, professional liability insurers saw their loss ratio increase from 108 percent to 130 percent. The ratio reached 134 percent in 2000 and an estimated 154 percent last year (Benfield Blanch 2002). These losses could not be offset because the companies also lost money on their investments in the stock market.

Legal system's limits

Trial by jury in a medical malpractice case is not a good measure of the quality of care provided, for two key reasons. One, jurors do not compare care provided by a defendant to established clinical quality criteria but to less clearly defined prevailing "community standards" that differ widely from community to community. As a result, jury verdicts often hinge on the persuasiveness of dueling expert witnesses. Two patients can sue for malpractice and come out of their respective courtrooms with opposite results. The subjective nature of jury awards contributes to the difficulty insurers have in predicting how much money to reserve for future claims.

Second, jurors base damage awards to victims of malpractice on real or perceived negligence on the part of the defendant. In other words, juries' awards reflect a monetary assessment of the amount needed to compensate the injured patient. They do not provide a quality assessment of the caregiver. Nevertheless, experts agree that hospitals and physicians can do much more to reduce claims that result from medical errors by intensifying their risk management programs and establishing best practices in their clinical and administrative programs.

Impact on quality

Efforts to link tort reform in the jury system to the whole set of issues related to improving health care quality are tenuous at best. Neither premium rates nor jury awards are quality measures. Hospitals that were self-insured during the 1980s and then switched to commercial insurers during the low-premium 1990s now are going back to self-insurance. Reinsurers, however, are requiring that self-funded hospitals assume higher levels of risk before their reinsurance coverage will begin. For example, hospitals used to purchase policies that required a hospital to pay the first $1 million in claims before the reinsurance policy would take effect. Currently, the market requires that the hospital pay $10,000,000 before coverage begins. That puts hospitals at greater direct financial risk for malpractice claims at their facilities, and should intensify already powerful business incentives to reduce the number of claims.

The future

There is no quick way to resolve the affordability or availability issues. To bring the medical malpractice insurance crisis to an end, hospitals, physicians, and insurers must work together to stabilize the claims experience and instill confidence in the marketplace to attract new insurers.

First, insurers must become facilitators to assist hospitals and physicians in reporting their claims earlier. The average reporting time for claims is 23 months after the event. The statute of limitations on filing claims is 24 months. The lag reflects physicians' fear of the consequences of reporting bad outcomes, so they tend to wait until they are sued. Prompt reporting of negative outcomes would allow insurers and attorneys to settle cases without jury trials, which saves time and money. Physicians would be well advised to take a close look at the behavior that takes place after a serious patient outcome or variation in care. Some hospital administrators still hesitate to tell patients about the causes of negative outcomes. Hospitals and physicians need to report negative outcomes promptly.

Another strategy that would affect the cost of claims is to coordinate the defense of a claim. Physicians, to the extent that it is ethically permissible, should avoid retaining multiple attorneys on the same case. Most doctors believe that they need their own attorney in a malpractice case. Coordinated defense between hospitals and physicians should also be encouraged. Recently, hospitals and physicians have found that, 85 percent of the time, they can coordinate defense. Coordinated defense not only saves money on multiple attorneys' fees, it avoids the finger pointing that occurs in many cases and works to the plaintiff's advantage with the jury. When juries make awards in malpractice cases, jurors are

routinely asked what swayed their opinions. In an appalling number of cases, jurors express concern about the amount of blame-shifting in physician testimony.

Finally, hospitals and physicians must coordinate their own risk-management programs to ensure that clinical and administrative best practices are incorporated into their daily activities. These routine practices will, inevitably, reduce negative outcomes and will allow a stronger defense in the event of a lawsuit.

Conclusion

Crises of affordability and availability resolve themselves in time. Once there is stability in the marketplace, new entrants come in, prices stabilize, and coverage becomes more available. Physicians and regulators would do well to learn from this historical trend that price competition should not be the only goal. Improved patient quality, price stability and financially sound insurers are the policy goals that the legislature must support through its policy initiatives.

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Part IV

Technology: How Providers & Purchasers Gauge Quality

Case Study of Physician Adoption of Technology

RICHARD FIEDOTIN, MD, MBA
Founder, Vice President, Clinical Products, ePocrates,San Mateo, Calif.

Health care providers and payers tend to gauge health care quality in vastly different ways. Although many providers rely more on personal judgment and on their peers' behavior than they do on quantifiable evidence, purchasers usually demand detailed outcomes. Those outcomes often are based on the purchaser's own studies and experiences. Unlike providers, insurers are unwilling to rely on the experiences of other players in their marketplace. This article describes the early reaction of providers and purchasers to a new clinical-software application and provides insight into the route by which physicians and health care organizations adopt new tools.

The software application, ePocrates Rx, was introduced in November 1999 by ePocrates Inc., based in San Mateo, Calif. The application, which is available free of charge, typically is used with a personal digital assistant (PDA). It provides users with rapid access to up-to-date clinical and formulary information for about 2,700 medications. If, for example, a physician wants to prescribe a branded medication for a patient with insulin resistance and the patient is covered by a health plan whose formulary is in the database, the device discloses whether the health plan requires prior authorization for the drug. If prior authorization is required, the physician can tap on an icon to view the authorization requirements and determine whether the patient is eligible to receive the drug. If a patient fails to meet eligibility requirements, tapping the screen generates a list of alternatives in the same therapeutic class. After choosing a medication, the physician can view clinical data about the drug.

The product gained swift physician acceptance though word of mouth. Physician acceptance enabled the ePocrates product developers to persuade a few managed care organizations to underwrite part of the cost of the technology. These MCOs did so because they believed the software might reduce adverse drug events (ADEs) and improve the efficiency of a medical practice. In the absence of data from rigorous studies to demonstrate the tool's value, however, the majority of MCOs have been reluctant to embrace it.

During the 3 years since its introduction, ePocrates has acquired 700,000 users, including 245,000 physicians, or 30 percent of all active physicians nationwide. About 25,000 users are being added monthly, and about 85 percent of physicians who possess a PDA have downloaded the ePocrates software. The software has been broadly adopted across almost all specialties (Table 7, page 14).

The software is available without charge, but its use also has been driven by perceptions of accuracy and value, along with word of mouth. Three of four physicians who use ePocrates have heard

TABLE 7 Penetration Among U.S. Physicians by Specialty

Specialty	MDs using ePocrates	Total physicians in specialty*	Penetration, %
Oncology	3,073	4,443	69.2
Infectious diseases	2,737	4,285	63.9
Emergency medicine	13,914	22,211	62.6
Nephrology	3,004	4,957	60.6
Pulmonology	4,261	7,504	56.8
Cardiology	10,048	18,198	55.2
Endocrinology	1,978	3,799	52.1
Gastroenterology	4,175	8,899	46.9
Neurology	4,776	10,261	46.5
Internal medicine	42,228	97,699	43.2
Allergy and immunology	1,480	3,501	42.3
Rheumatology	1,161	3,201	36.3
Family practice	33,435	93,435	35.8
Dermatology	2,678	8,733	30.7
Pediatrics	16,558	54,044	30.7
Obstetrics/gynecology	10,921	36,966	29.5

*AMA count, as of June 2002, adjusted to exclude inactive physicians.

about it from other clinicians. In addition, physician acceptance undoubtedly has been spurred by a favorable product review in the *Journal of the American Medical Association*, in which the author described ePocrates as "virtually indispensable" and proclaimed it to be the "benchmark" (Hogan 2001). For the most part, physicians begin using ePocrates on a regular basis only after they have conducted a subjective evaluation to determine its ability to help them provide better and more efficient care.

The ePocrates software became popular among physicians well before there were any published data to demonstrate that the product reduces ADEs and improves the efficiency of a practice. The first outcomes data were not published until nearly 3 years after product launch (Rothschild 2002), and they appeared in the *Journal of the American Medical Informatics Association*. The study consisted of a 7-day online survey conducted during March 2000 — 5 months after the software became available — of 3,000 randomly selected ePocrates Rx users. Physicians reported that ePocrates Rx saved time during information retrieval (with a typical retrieval taking 20 seconds using the new software, as opposed to between 1 and 5 minutes using less technologically advanced methods), was easily incorporated into their workflow, and improved drug-related decision making. Survey respondents also believed that using ePocrates Rx reduced the rate of preventable ADEs, as 50 percent of them estimated that it decreased their rate of ADEs by at least 1 per week. The study did not, however, *prove* that use of the product led to any reduction in ADEs. Instead, it merely reported that some users *believed* they were avoiding ADEs, even though the researchers established no control group and generated no morbidity and mortality data to substantiate this belief.

Although the ePocrates Rx software is free, a PDA typically costs several hundred dollars. Thirty percent of physicians surveyed in the *JAMIA* study reported that they purchased a PDA just to be able to use ePocrates Rx. While many hold to the view that doctors tend not to spend their own money on devices like these, some doctors are spending money to acquire hardware solely to use the new software, which may make the fact that the software is free almost insignificant. Using the ePocrates Rx software also involves a commitment of time, because it takes between 30 and 45 minutes to install and necessitates either a phone call or an e-mail to the company's customer support center.

By using the ePocrates Rx software, physicians are providing clear evidence that they are willing to change their behavior, in spite of time constraints that may dampen enthusiasm for learning a new skill — even when acquiring that skill will be beneficial in the long run. The early experience with ePocrates Rx shows that many physicians are willing to invest time and money in a new technology, even though they lack hard data on the expected return.

Insurer participation

It is interesting to contrast physician behavior with payer behavior. To incorporate MCO formularies into the software, ePocrates had to work with insurers, pharmacy benefit managers, and in a few cases, independent physicians associations, many of which initially refused to participate, despite being allowed to present their formularies without charge.

In 2000, ePocrates conducted a study, in conjunction with AdvancePCS, and presented the results at the Academy of Managed Care Pharmacy 2001 convention in Dallas. The 4-month study involved 104 physicians at two physician groups in Connecticut. Data generated during the study period were compared with data for the same cohort during the 4 months prior to the study. During the study period, the software was used by 89 percent of the participants, with each user employing it an average of 16 times. The results showed that, for all therapeutic classes, utilization of generic and preferred brands increased by 1.7 percent and 3.9 percent, respectively, compared with utilization during the prestudy interval. Specifically, the share shift (change in prescribing pattern, away from nonpreferred brands) toward generics was 12.5 percent for antifungal agents, 12.2 percent for calcium-channel blockers, 8.6 percent for antiviral agents, and 6.4 percent for beta blockers. The share shift toward preferred brands was 10.5 percent for statins, 9.9 percent for angiotensin II receptor blockers, and 7.0 percent for alpha antagonists.

These data enabled ePocrates to generate relationships with MCOs, some of which were charged fees to have their formula-

ries incorporated into the software. The fees were based on three performance factors: adoption (the number of ePocrates users), utilization (frequency of use), and share shift. Monitoring data were provided by IMS Health.

In 2002, some MCOs started paying flat fees to ePocrates based on the number of insured members to whom they provide a pharmacy benefit. Initially, these companies were unwilling to participate in the program, even when the formulary-posting service was offered free of charge. They became willing to assume risk, with little data to support the decision, when they perceived the possibility of improvement in provider and member relations, including goodwill from physicians who appreciate access to their formularies. MCOs may participate financially in this kind of activity if they believe it will make them more competitive in sales and marketing by touting their technological progressiveness.

Because a control group was lacking and because the researchers investigated a patient population that was different from theirs, MCOs appear to be skeptical of data from the AdvancePCS study. Nevertheless, the change in physician behavior reported in that study was widespread in many therapeutic classes. Additionally, five insurers have planned their own outcomes studies.

Even without a substantial database to demonstrate the value of the software, some MCOs support it because of physician demand. Physicians who already are using the software have sent MCOs thousands of letters or e-mails requesting that they put their formularies onto ePocrates Rx.

Conclusion

Some MCOs that are providing financial support for ePocrates Rx assume that physician use of the software will improve quality of care and physician prescribing behavior. They also may affirm that their participation will enhance relationships with members and providers — especially in situations where providers are asking for the service.

The early experience with ePocrates Rx suggests that physicians will adopt a new technology without data from rigorous studies. They will use the technology if they determine, through their own experience or peer recommendation, that it is accurate, saves time, and improves care.

Nevertheless, it is reasonable to assume that payers, insurers, and MCOs will hesitate to participate in the ePocrates program — particularly if expected to assume some of the costs associated with supporting the software — unless outcomes data can be generated that will prove that use of ePoctrates will decrease prescribing errors, improve quality of care, and generate a return on their financial investment.

The ePocrates experience suggests that obtaining market awareness is the first step toward gaining physician adoption of a technology product. The second step is to generate revenue by charging MCOs a reduced rate initially, so that the new customers are receiving introductory prices. As the product gains acceptance, the charge can be increased.

The business model for implementing this software depends on having a product that involves little or no cost to the end user. While this model would be untenable for a pharmaceutical product or a medical device, using software to send data over the Internet is both relatively inexpensive and workable.

Finally, MCOs recognize that use of ePocrates Rx may improve both clinical outcomes and quality of care, while simultaneously generating positive publicity.

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Technology Helps Eliminate Medical Errors

BARRY P. CHAIKEN, MD, MPH
Vice President, Medical Affairs,
McKesson Corporation, Boston

In 1999, approximately 43,000 people died from motor vehicle accidents, 42,000 from breast cancer, and 7,000 from medication errors — but none from errors in nuclear power plants. Nuclear power plants are complex and difficult to run, and their managers, therefore, focus on identifying potential errors and instituting processes to prevent them. NASA likewise conducts the same error-fault analysis with space flight, recognizing the need to anticipate trouble before it appears. Regrettably, the health care system has not fully embraced this process-analysis approach to identify potential errors and prevent them.

The estimate of 7,400 deaths from medication errors comes from the controversial Institute of Medicine (IOM) report, *To Err is Human: Building a Safer Health System* (Kohn 1999). In addition, the report suggests that anywhere from 44,000 to 98,000 patients die each year from medical errors of all kinds. These figures only consider inpatient care; the studies on which they were based did not consider the ambulatory setting. Setting aside the debate on the actual extent of mortality due to errors, the number is unacceptable at either end of the estimated range and warrants attention. Fortunately, through the use of technology and the application of process-improvement strategies, organizations can reduce those numbers significantly.

The degree to which the public blames medical errors on physicians is not certain, although in most highly publicized malpractice cases, the public seems to side with the patient. In contrast, most patients view their own physicians as highly competent, hard-working individuals. Few people would describe their personal physician as possessing skills that are merely average or as being incompetent. In reality, the physician population contains few practitioners at either extreme, and the majority of physicians are highly trained, competent professionals who provide good care. That said, the public generally believes that medical errors are due to careless and incompetent physicians, nurses, and other health care professionals — a viewpoint that is inconsistent with reality.

If the health care industry is to learn from those industries that excel at safety (e.g., airlines), preventing errors has little to do with human mistakes and much to do with poorly designed and executed processes. The message of the IOM report is clear — safety is a systems problem, not a people problem.

Medication, therapeutic, and other types of medical errors could be significantly reduced through the use of information technology solutions. Several hospitals use computerized physician order entry systems with clinical decision support (CPOE/CDS) to enhance patient safety while reducing the overall cost of care. These systems employ evidence-based medical guidelines to help physicians order those tests, medications, and therapies that are proven to deliver the best outcomes in patients, while alerting clinicians to potential complications and contraindications. Other types of technological solutions could also serve to avert errors in patient treatment. These include robots and cabinets for medication distribution, and use of bar codes at the point of care for medication administration.

Leapfrog leads the way

To enhance patient safety in the health care institutions that care for their employees, several large employers formed the Leapfrog

Group. Today, more than 120 Fortune-500 companies are members of Leapfrog. After much consideration, the group settled on the following three initiatives as first steps to promote patient safety:

- *CPOE/CDS to reduce medication errors.* Leapfrog cites researchers who report that up to 50 percent of all medication errors occur at this stage of the medication-management process.
- *Evidence-based hospital referrals,* to direct patients to centers where disease and procedure-specific care is of high quality. Leapfrog believes that centers that perform a high number of procedures or have extensive experience with treatment of a particular disease will produce better patient outcomes.
- *Use of intensivists* (highly trained critical-care doctors) in critical-care units and access to those physicians on a 'round-the-clock basis. Leapfrog believes this measure will improve patient outcomes, because these physicians have greater experience in critical-care issues than their primary care colleagues do.

Clinician adoption: key to improvement

Historically, physician adoption of clinical information technology tools has been slow and difficult. Yet, the potential benefits of clinical information technology tools cannot be tapped unless adoption is widespread. Although physicians are stereotypically perceived as technophobic, evidence exists that this is not necessarily the case. For example, according to a recent study, about 90 percent of physicians accessed the Internet in 2000, with 55 percent accessing it daily (Deloitte 2001). In addition, about 33 percent use personal digital assistants (PDAs), according to the fifth annual Modern Physician/PricewaterhouseCoopers survey (Versel 2002).

To learn more about physicians' adoption of technology, San Francisco-based McKesson Corp., a vendor of information technology, commissioned Harris Interactive, the online market researcher, to examine key drivers that move physicians to use new information technology (Chaiken 2002). Through an online survey, Harris interviewed 200 physicians and 100 nurses in community-based hospitals of at least 200 beds. In addition, Harris held an online focus group of CEOs, CMOs, CIOs, and CNOs. Both physicians and nurses responded overwhelmingly that quality of patient care was the most important issue for them. This challenged the commonly embraced paradigm that economic pressures supersede patient care for clinicians. Some 60 percent said they believed that existing clinical information technology can improve quality of care. An additional 26 percent indicated that they expected it to be available in 2 to 5 years.

More probing questions dealt with specific use requirements. Doctors told Harris they want access to patient information — laboratory results, pathology reports, radiology results and more — from one screen, with single sign-on for all applications. In addition, they desire to use a variety of devices (e.g., desktop computer, PDA, pager) to access clinical information remotely and while mobile.

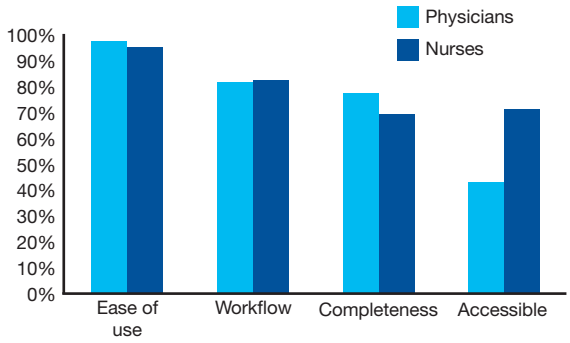
Finally, clinicians said the technology must be easy to use and fit into their workflow. This includes access from the hospital, clinic, or home. Physicians make up a small group of professionals who require continuous access to information yet lack a consistent place of work. To achieve high levels of physician adoption, clinical information technology solutions must satisfy this mobile workflow (Figure 6).

Looking for return on investment

Reducing errors via clinical information technology requires an investment of resources and political capital. Few facilities can "order" their clinicians to accept a new technology. Organizations must develop positive working relationships with members of their clinical staff to ensure a successful transition to the new technology, and build the foundation that will lead to smooth implementations of additional tools in the future.

FIGURE 6 Technological Advances

What drives adoption?



Developing an institutional strategy helps to reduce the risk of failure. Successful strategies choose projects that initially offer significant benefits but have few associated risks. These projects often can deliver high levels of physician adoption that can then be leveraged when implementing more complicated clinical solutions, such as CPOE/CDS. By obtaining high levels of adoption early with simpler projects, a framework is established whereby more complex but incrementally more valuable solutions can have a greater probability of success. The goal is to achieve high levels of adoption early and to carry those adoption levels through the incrementally more complex clinical solutions as they are implemented.

For example, CPOE/CDS, a highly complex solution, forces physicians to use a computer to enter orders in the acute care setting. In addition, this application provides guidelines, order sets, and alerts at the time of ordering, thereby making the entire ordering process for the physician considerably more complex. This higher level of interaction with the clinical information technology solution requires a degree of change in physician workflow. This clearly demands proper training and more time for a physician to learn to use the solution. Until physicians become comfortable with a system and are able to appreciate its benefits, physicians initially may feel inconvenienced. In time, within institutions that properly plan the introduction of their technology solutions, this apprehension about the technology will dissipate.

Not all organizations have equal funds to pay for these solutions, and therefore will view the return on investment differently. Competing projects often may take precedence over patient safety information technology investments. Organizations with greater institutional endowments will have the opportunity to use both. Investment in technology presents a unique decision-making process for each organization.

Medical-error reduction

Medical errors can occur from a lack of knowledge in the caregiver. During the last 20 years, the number of pages in the *Physicians Desk Reference* has grown from about 1,100 to more than 3,000. This growth reflects the introduction of more than 30 new drugs each year. If new peer-reviewed medical journal articles are included, the amount of new information confronting a physician is not only staggering but also impossible to assimilate. Access to evidence-based medical guidelines at the point of care using information technology tools helps physicians process this new in-

formation and increases the probability that it will be used during decision making.

Other causes of medical errors include the confusing drug names that can easily be misinterpreted when reading marginally clear handwriting. Examples of commonly misinterpreted drug orders include confusion between the drugs Celebrex and Celexa, both frequently prescribed for elderly patients, yet one is for arthritis and the other is for depression.

Handwriting problems also cause orders to be incorrect in dosing and administration frequency. Often q.d., meaning once daily, is confused with q.i.d., meaning four times a day. Medical educators are trying to get physicians to replace q.d. with "q. daily," to reduce confusion. Some institutions have tried to combat the handwriting problem through penmanship classes for physicians. Unfortunately, this approach places blame on the individual, rather than focusing on process improvement.

CPOE/CDS orders are electronically standardized, and potential handwriting-induced errors are eliminated. In addition, CPOE/CDS offers physicians protocols for providing evidence-based care to their patients. Unlike paper protocols, which are inconvenient due to their lack of easy access and portability, CPOE/CDS brings disease-specific protocols to the point of care at the time of clinical decision making. Access to the information becomes an integrated part of the care process.

Effective CPOE/CDS presents physicians with all the critical information needed to treat a patient, helps focus the physician on critical laboratory values and medications that could influence the treatment decision, and makes the ordering process, with potentially complicated calculations, simple and easy.

For example, for a patient with a pulmonary embolism who requires anticoagulation therapy, a computerized protocol would highlight current bleeding-time values, provide a list of prescribed medications that could affect bleeding times, and offer a standard set of orders to properly anticoagulate and monitor the patient. Not only can such a protocol perform the necessary drug calculations, it also can create a checklist of the factors that a physician needs to consider when anticoagulating a patient. In addition, the system permits the physician to deviate from the protocol and provide reasoning for such a decision. This creates a database of additional knowledge that could be used to monitor and enhance the effectiveness of the existing protocol. Finally, all medication orders can undergo drug-drug, drug-dose, and drug-allergy checking against an up-to-date electronic clinical database.

In contrast to complaints that protocols are "cookbook medicine," properly designed and implemented protocols reduce the burden on physicians to memorize miscellaneous facts, and allow them to focus on more complex problems of diagnosis and treatment.

Currently, Vanderbilt University Medical Center, in Nashville, has implemented CPOE/CDS for physician use. On an average day at Vanderbilt, more than10,000 orders are generated, with 70 percent of the orders entered by house staff or attending physicians. The remaining orders are made up of emergency and verbal orders. Of approximately 400 warnings generated each day, 15 percent to 20 percent result in a change in the initial ordering plan. Vanderbilt has demonstrated financial savings from a reduction in laboratory tests, selection of less expensive antibiotics, and improved documentation for reimbursement.

Other patient-safety technology

In addition to CPOE/CDS, such technologies as bar-coded medications and medication-dispensing robots and cabinets can help enhance patient safety by reducing medication errors. The same technology that helps grocery and department stores manage inventory and accurately price products at checkout is now being used in hospitals to increase the accuracy of the medication-management process. For example, bar coding of medications, patients, and health care staff allows information technology systems to automatically perform the five "rights" of medication administration — right drug, right dose, right route, right time, and right patient. Because bar-coding is regarded as a proven technology to enhance patient safety, Congress is considering its inclusion in patient-safety legislation.

Robots and cabinets utilize bar-coded medications to stock and dispense medications in the pharmacy and on the floors. Both have been proven to enhance safety while providing financial benefits through increased medication management efficiency.

Clinical-information tools also enable potential problems to be monitored and the appropriate clinical personnel notified as necessary. Such proactive surveillance helps to eliminate many life-threatening problems or identify them at an early stage, when they are more easily treated (e.g., patients on the heart medication digoxin who are susceptible to life-threatening complications if their serum potassium falls below the normal range). Automated surveillance tools free the physician from the unreasonable burden of remembering and then checking every potential problem.

Conclusion

Institutions that want to enhance patient safety and improve outcomes cannot ignore the multiple benefits of clinical information technology tools. Maximum benefits from such tools can be obtained only through well-planned use of various clinically helpful information tools that will be widely adopted by physicians. Once such technology is established, organizations can work to introduce more complex but incrementally more beneficial solutions such as CPOE/CDS. Such solutions can dramatically reduce variability of care, reduce costs, improve outcomes, and enhance patient safety.

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Part V

Technology: Enabling Consumers To Know Quality

The Educated Health Care Consumer

DAVID SHULKIN, MD
Chief Quality Officer, Professor and Chair, Dept. of Medicine,
Drexel University School of Medicine, Philadelphia
Chief Medical Officer and Chief of Medicine,
Medical College of Pennsylvania Hospital, Philadelphia
Founder, DoctorQuality Inc.

Is the current emphasis on providing ever-improving patient safety a passing trend or an emerging paradigm shift? Might this focus on patient safety be a harbinger of fundamental changes to the health care industry? If this pattern is here to stay — as seems likely — then providers and managed care organizations (MCOs) can adapt or risk extinction.

Patient safety defines health care quality. As a result, patients are beginning to be guided by two age-old axioms — "let the buyer beware" and "the customer is always right" — in their health care service selections.

With the personal computer and Internet access as ubiquitous as telephones and televisions, patients have used this now-standard information technology to become educated consumers of health care products and services.

Patients are aware of safety issues and incidents and are increasingly involved in their health care decision-making process. Providing a safer health care environment is a business essential for the savvy health care entity.

Success depends on providing a quality product and communicating that to consumers. With respect to both quality and communication, technology is a vital component. For MCOs and providers, initial investments in the requisite technology will doubtless be expensive; for the health care entity that hopes to remain financially stable — or even extant — in a consumer-oriented business environment, however, those expenses are necessary.

Inflection points

Consider how Henry Ford's moving assembly-line process dramatically changed the way cars are manufactured, made the Model T available to the masses, and even influenced the basic concept of the modern car (Frontenac 2002). Similarly, data manipulation technologies and deregulation, which shaped the current competitive environment, have dramatically changed the banking industry. These are examples of inflection points, which, by definition, signal paradigm shifts.

In health care, the Flexner Report (Flexner 1910), published in 1910, dramatically altered the way North American physicians are trained. The development of managed care payment mechanisms in the 1970s and 1980s fundamentally changed the way the entire health care system is organized. Those are examples of inflection points in the health care system. Most inflection points are driven by forces external to the industry, and tend to be powered by market-driven forces.

Four stages

Using a four-stage market model that is based on the theory of inflection points, physicians, health care administrators, and MCOs can ascertain the degree of paradigm shift in patient safety locally (Millenium Health, 2001). They can then use that information to determine how to proceed in terms of the health care entity's patient-safety program.

Stage 1: Acknowledgement. In this earliest market stage, health care entities have started to become proactive, if not aggressive, toward patient safety. Administrators and others have read the Institute of Medicine report (Kohn 1999) on the subject, and physician groups, hospitals, and clinics have begun to report errors and perform organizational assessments focusing on patient safety.

Stage 2: Differentiation. A stage-2 market features regulatory initiatives, responses from the market (such as those inherent in malpractice issues), employee response to using the data available from patient safety advocacy organizations (such as the Leapfrog Group), and additional legislation. Providers in stage-2 markets tend to provide more intensive staff training, engage in more extensive data collection, and begin to investigate preventive risk strategies relevant to patient safety.

Stage 3: Implementation. In this stage, providers begin innovating, applying the strategies that they have investigated, to achieve patient safety, using technology to redesign systems and alter the organization's patient-safety culture.

Stage 4: Reward. In the stage-4 market, providers become true learning organizations and, having implemented methodologies — such as Six Sigma (see sidebar) — have subsequently improved patient safety and become market leaders. These leaders, in turn, reap the rewards of their efforts, paying for performance in a meaningful way and generating favorable response among informed consumers.

Applying this market model to the United States, it is apparent that most of the country is in stage 1 or 2, a few states are in stage 3, and three states are moving quantitatively into stage 4 (Shulkin, unpublished data, 2002).

Focus on patient safety

Patient safety is a serious concern to patients and their caregivers, relatives, and friends. Many have heard the anecdotal stories about kidneys being misplaced, patients being seriously injured or killed because they received the incorrect medication, and surgical instruments being sewn into patients and discovered much later. According to published reports, about 42 percent of American adults have been involved, either personally or through a friend or relative, in a situation in which a medical mistake was made. Of those, 22 percent reported that the medical mistake was associated with a medication or medical procedure. Further, 61 percent of patients are concerned that they will be given the wrong medication; 58 percent, that multiple medications they receive will interact negatively; and 56 percent, that something negative will happen associated with a procedure they are undergoing (ASHP 1999).

In response, patients seek information about the disciplinary and legal actions taken against physicians involved in medical errors, and about mandatory patient-safety courses for physicians. This is a stage-1 market. According to the National Academy for State Health Policy, 20 states currently have mandatory medical-error re-

porting rules and statutes on the books; since 1999, 106 pieces of relevant legislation have been introduced in 26 states (NASHP 2002a; NASHP 2002b).

In a stage-2 differentiation market, health care providers ask: "Is there really a market?" "Can we use patient safety as a health care differentiator?" and "Are there really health care consumers who select providers based on patient-safety factors?" Meanwhile, health care consumers are actively seeking information that will help them to become educated, asking: "How do I know I'm getting the right care?" "How do I find the right doctor to provide that care?" and "What can I do to prevent a medical error from happening to me?"

People are deriving information from multiple sources but still tend to select their physicians and hospitals, in large part, on the basis of recommendations from friends and family members. It is reasonable to expect that, given specific, negative information relating to quality-of care, many patients would consider changing physicians and/or hospitals.

In response, the health care marketplace is beginning to meet those needs for more information. Many commercial companies have begun to correlate data relating to hospital and physician quality, and the federal government is increasingly making available to the public more information on health care quality, safety, and other factors. It is becoming easier for health care consumers to differentiate providers, particularly hospitals, based on mortality rates, information about procedures, and so on.

In a stage-2 market, malpractice clearly is becoming an important differentiating factor. For example, in Pennsylvania, a physician who has one or two claims against him cannot buy reasonably priced malpractice insurance.

Curiously unresponsive

Perhaps surprisingly, many hospitals really have not yet begun to address the medical-error issue, despite ample indicators that the marketplace is changing.

Patient safety improvements have been made, but not on a large scale, which is why there are so many stage-1 and stage-2 patient-safety markets and so few stage-3 and stage-4 markets. Data from evidence-based practices argue in favor of establishing patient safety measures; yet these strategies are not being implemented to any substantial degree, because so many legal, cultural, and financial counterincentives are slowing them down.

Consider the case of Ben Kolb (Hockenberry 2002, Belkin 1997), a seven-year-old Florida boy who entered Martin Memorial Hospital in Stuart, Fla., on Dec. 13, 1995, for routine ear surgery. This boy died because he received the wrong medication. Lidocaine and adrenaline were poured from their factory-sealed vials into two open sterile cups, side by side. Although the cups were labeled, the liquids are indistinguishable. About 20 minutes after the patient received general anesthesia, the surgeon gave him an injection, but the syringe contained not the local anesthetic, which would have reduced bleeding during surgery, but the stimulant that led to the boy's death. Martin Memorial did what hospitals in stage-3 markets do. They went beyond learning about their problems and decided to make changes to correct them. Once the error was identified, the hospital immediately changed its procedure, henceforth filling syringes directly from the vials. Additionally, the Joint Commission on Accreditation of Healthcare Organizations issued an advisory addressing the situation (JCAHO 2000).

Six years after the tragedy in Florida, NBC's *Dateline* reported that some of the best hospitals in the country still pour adrenaline and lidocaine into two unmarked cups in the operating room.

Why are health care providers not reporting medical errors? Why are more markets not moving into stage 3? In general, people are afraid that if they report errors, they will be perceived as incompetent, losing their jobs and reputations. Institutions do not want to lose market share, nor do they want to receive a surprise JCAHO visit. Moreover, there are concerns about liability.

What is Six Sigma?

Six Sigma is a methodology that uses data and statistical analysis to measure and improve an organization's operational performance by identifying and eliminating defects in its processes.

Six Sigma began when Carl Frederick Gauss (1777–1855) introduced the concept of the normal curve, and it was first applied as a measurement standard in product variation in the 1920s, when Walter Shewhart showed that three sigma from the mean is the point at which a process requires correction.

In the 1980s, engineers of the Motorola Corp. decided that traditional quality levels were inadequate. They wanted to measure product defects in terms of millions of opportunities, rather than thousands. Motorola subsequently developed this new standard and created the methodology and cultural mechanisms associated with it. Motorola documented more than $16 billion in savings as a result of Six Sigma implementation.

The objective of Six Sigma is to reduce process output variation so that plus-or-minus six standard deviations lie between the mean and the nearest specification limit. This permits no more than 3.4 defects per million opportunities.

Six Sigma team leaders are identified by level of expertise, according to a system that borrows heavily from the martial arts. Green Belts receive coaching and support from Black Belts, who are mentored by Master Black Belts, who are responsible for the strategic implementations of Six Sigma within an organization.

Six Sigma has a unique corporate culture, with jargon that is comparable to a second language for the uninitiated. Therefore, choosing to implement the methodology may necessitate the development of a specific mindset and is associated with a learning curve. Some terms that are germane to Six Sigma follow.

Voice of the customer: It is necessary to determine the customer's requirements and standards, relevant to the product or service being provided. Listening to the voice of the customer helps the organization design its processes and systems to deliver what the customer requires.

Drivers of customer loyalty: Listening to the voice of the customer and meeting the customer's needs drive customer loyalty.

CTQs and TLIs: "Critical to quality" issues and "top level indicators" are at the heart of every product and process. In the design stage, the CTQs are defined and used to construct the product; before the product is offered to the customer, the TLIs are measured and understood.

More information is available at: «http://www.isixsigma.com».

SOURCE: Six Sigma 2002.

Mindset development

An important change to make is in the mindset or institutional culture. For example, Baylor Medical Center at Grapevine (BMCG), a 104-bed hospital near Dallas, has implemented a paperless, Internet-supported medical error tracking system (METS) as the first phase of a safety initiative that includes future installation of a computerized physician order entry (CPOE) system and development of online patient access for medical-error reporting.

BMCG simultaneously implemented an initiative called "I Plant Flags," to motivate hospital staff members to report errors and near misses. Beyond rewards, such as movie tickets and coupons for gifts, the error reporter wears on his or her lab coat an American flag that says, "I cared enough about what's happening in this hospital to report an error I was involved in." The initiative gives people of integrity the opportunity to point out pitfalls rather than ignore them. They literally "plant the flag," so that other staff members can avoid repeating such a mistake and so that administrators can address the problem. Error reporting at the hospital increased from 10 to 15 reports to more than 100 per month (DoctorQuality 2001).

Hospitals in stage-3 markets are beginning to understand where their errors are occurring. As published in the *Journal of the American Medical Association*, the federal government's Agency for Healthcare Research and Quality (AHRQ) recently reported dozens of risk-reduction measures, including prophylaxis to prevent venous thromboembolism in at-risk patients, the use of perioperative beta blockers, the use of maximum sterile barriers during central-line catheter insertion, antibiotic prophylaxis in most surgical patients, asking patients to restate what they were told during informed-consent discussion, continuous aspiration of subglottic secretions to prevent ventilator-associated pneumonia, and much more (Vastag 2001).

Turning to technology

Hospitals in stage-3 markets are starting to take advantage of relevant technology, using systems and devices that can prevent medical errors. For example, the Leapfrog Group's CPOE system allows physicians to submit prescription orders digitally, rather than on paper. CPOE integrates prescriptions with patient information, prompts against drug interactions, allergies, and overdoses, and eliminates confusion that is typically associated with more traditional prescription ordering methods (Leapfrog 2002). Another example is ePocrates, a software program that establishes communication networks and provides databases for clinicians, based on hand-held computers (ePocrates 2002).

The stage-4 market is essentially about return on investment. Can an economic reason be established for moving into a stage-4 market? The literature is sparse, and the best available data to develop a business case for improving patient safety relates to the rising costs of malpractice premiums.

Rewards

Intuitively, the providers who are improving patient safety and are accumulating data to demonstrate that improvement need to make such information available to group purchasers and consumers. This, in turn, will improve market share and, ultimately, increase reimbursement.

Managed care organizations use patient input to select and reject providers, and patients have an increasing role in the decision-making process that affects provider selection. Further, MCOs are starting to establish pay-for-performance systems, providing physicians with direct financial rewards for meeting established quality targets.

An important trend in stage-4 markets will be the introduction of provider tiers. Hospitals and physicians will be classified into "A" and "B" networks, based on safety and quality data. That stratification will help create an economic basis for improving patient safety.

Conclusion

The purpose and intent of these efforts is to create a corporate platform for the future, using and inventing the technology for today and tomorrow, focusing on identifying the unique needs of the customer, providing quality care, and improving patient safety. The costs may seem high, but the rewards are invaluable. In essence, it is necessary to positively affect quality and cost of care, while allowing care to remain affordable and available to the consumer.

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Technological Advances in Pharmacy Benefits: The Medco Health Experience

ROBERT J. BLYSKAL
Executive Vice President of Operations and Technology and Chairman, Business Quality Steering Committee, Medco Health Solutions, Franklin Lakes, N.J.

The rising cost of prescription medications rapidly has become a significant public policy issue. It also has taken on special significance as an affordability issue for the thousands of health plans that provide a prescription drug benefit to more than 200 million Americans. With the national rate of spending on prescription drugs increasing dramatically over the past 4 years, the pressure has been building on both health plan sponsors and the pharmacy benefit management (PBM) industry to develop innovative approaches to control spending without sacrificing the quality of care that their employees (or members) receive.

Consider, for example, the situation belonging to a typical major employer that offers a prescription drug benefit to tens of thousands of its staff and retirees. If the cost of that benefit exceeds $100 million this year, next year it can be expected to cost $115 million, if no changes are made to the benefit plan. Such increases are difficult for any organization to absorb, even if the benefit itself is regarded as competitively necessary to attract and retain top talent.

As one of the nation's leading PBMs, Medco Health serves more than 65 million members — nearly 1 in 4 Americans — through a client base that includes Fortune 500 companies, Blue Cross/Blue Shield plans, insurance carriers, HMOs, third-party administrators, unions, and government employers. Medco Health not only manages transactions at retail pharmacies on behalf of its clients, but also dispenses prescription medications directly to members through a national network of home-delivery pharmacies. In 2001, Medco Health handled more than 535 million prescriptions, 75 million of which were dispensed in its own pharmacies. Of these, more than 7 million were ordered through the Internet (Medco 2002).

The role of technology in ensuring quality and patient safety

Medco Health established a total quality management program in the late 1980s, driven by the need to ensure that increasing volume would not jeopardize the accuracy of each and every order. About a decade ago, however, the company came to the conclusion that the traditional methods of filling prescriptions at its pharmacies — each location is essentially an autonomous operation — was not an ideal platform to increase accuracy and efficiency. Those improvements could only be achieved through economies of scale and greater automation. As a result, Medco Health fundamentally changed its whole pharmacy management structure and the systems to support it.

The company now operates two distinct types of pharmacy. Incoming orders are received at Medco Health's prescription processing and clinical review pharmacies, where pharmacists handle such cognitive functions as drug utilization reviews/formulary compliance and consult with prescribing physicians. Once a prescription has been verified and approved, it is routed electronically to one of two highly automated dispensing pharmacies. Together, these facilities can fill 1.8 million prescription orders per week, through the company's proprietary systems, exceeding Six Sigma levels of dispensing accuracy (Medco 2002). A statistical standard used to characterize a near-perfect production environment, Six Sigma represents a 99.9997 percent error-free rate.

All Medco Health pharmacies and call centers operate on an integrated networked platform. Among its principal capabilities, this platform allows the company to redirect prescriptions to the facility at which they can be filled most quickly and to answer member inquiries with greater speed and accuracy. By automating the process of putting pills into bottles, the system frees a majority of Medco Health pharmacists to apply their expertise where it is needed most, performing clinical reviews and counseling with members and physicians.

Although the automated dispensing system and the systems infrastructure supporting the integrated national network are important, Medco Health believes that technology alone is not sufficient to achieving the kinds of results needed to manage a clinically sound and cost-effective prescription benefit. Rather, substantive improvements depend on a carefully orchestrated integration of capable staff, well-defined processes, *and* technology. Blending these elements creates an overall corporate capability for success, which must then be continuously measured to ensure that the intended outcome is being achieved.

This outcome also must be tied to evolving client needs, while reflecting the respective roles and needs of other key stakeholders, including physicians, health plan members, and pharmaceutical manufacturers. These needs are often complex, and at times, potentially conflicting. Managing the ambiguity is a key to any business's success, and particularly to that of a PBM.

Financial commitment to quality

Medco Health has invested hundreds of millions of dollars to improve every facet of patient care and member service. The company has spent heavily to build its Internet capabilities and customer service system, and also has supported new technologies to improve physician access to data at the point of care.

Creating Medco Health's automated pharmacies required 8 years of development and hundreds of thousands of engineering hours. The company's first automated dispensing pharmacy opened in Las Vegas in 1996 with an initial capacity of 300,000 prescriptions per week. It now handles three times that amount (Medco 2002). Further refining the technology of its Las Vegas facility, Medco Health opened its second automated pharmacy a year ago in Willingboro, NJ. Together, these two automated pharmacies have delivered more than 100 million prescriptions to date.

Physician communication

While technology has revolutionized communications throughout our society, most prescriptions still are scribbled on a pad by a physician and handed to the patient. The intrinsic inefficiencies aside, handwritten prescriptions contain the potential for medication errors due to misinterpretation of a physician's handwriting. Thus, having a physician check a patient's medication history and current benefit plan provisions during a medical exam and then issue a prescription on the spot to the patient's preferred pharmacy has been a long-sought goal in medicine.

For a growing number of physicians, that goal has already been achieved. Known simply as point-of-care (POC) technology, various wireless hand-held and personal-computer-based systems are being tested by thousands of physicians. The technology improves convenience and adherence to plan provisions, identifies potential drug interactions that the physician may not be aware of, reduces costs and inappropriate utilization, and enhances quality of care by establishing a two-way flow of key information. Medco Health pharmacists, for example, can alert physicians to less expensive generic alternatives to name brand drugs and foster changes in prescribing behavior while the patient is still in the physician's office.

As with any emerging technology, however, there currently are no industry standards for POC technology, and the number of incompatible options can act as a barrier to its broad adoption. To address this issue, three leading PBMs — AdvancePCS, Express Scripts, and Medco Health — jointly supported the development of RxHub, a health care technology company with the stated mission of "connecting the prescribing industry electronically." RxHub offers a centralized system that allows any connected physician to send and receive e-prescribing information to any connected PBM and/or pharmacy (RxHub 2001).

Keeping the patient in the equation

As PBM clients look to control costs, more complex prescription plans are being introduced. Plan components ranging from multitier copayments to prior-authorization requirements have compounded benefit complexity and can confuse many members.

This, in turn, can undermine plan member satisfaction and even potentially compromise adherence to a drug regimen.

Communication has thus become an increasingly important component of managing the pharmacy benefit — both from the client's as well as the PBM's perspective. With increasing understanding of their benefits, members are more likely to comply with plan provisions and help to control the costs of the benefit plan for clients.

More attention now is given to how prescription drug benefits are communicated; methods include letters, e-mail, newsletters, and customer service scripting. Providing easy access to benefit-plan information online and presenting it in easy-to-understand language have long been primary objectives of medcohealth.com.

Nowhere are communication skills more critical than in a customer service department, where one-on-one interfacing with health plan members is standard. Several years ago, health plan members would simply inquire about the status of their home-delivery order or their copayment amounts at a retail network pharmacy. Currently, Medco Health customer service representatives and pharmacists are facing far more complex issues relating to quality and patient safety. To control pharmaceutical costs effectively — without it being perceived negatively by either the physician or the plan member — requires highly capable systems to support the human touch with members.

Conclusion

The capacity for prescription medications to improve health and save lives is beyond dispute. PBMs must make certain that the cost of providing these medications through a pharmacy benefit does not drift beyond the reach of the companies that provide it or those who need it. Continual improvement is needed to ensure that prescription drugs remain accessible and affordable, and that those who use the medications have convenient access to the information they need to stay healthy. This calls for innovative strategies and the people, processes, and technology to put them into action.

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Part VI

Three Directives for Evaluating the Business of Health Care

DAVID B. NASH, MD, MBA
Director, Office of Health Policy and Clinical Outcomes, Thomas Jefferson University Hospital, Philadelphia

Three directives, "point with pride, view with alarm, and end with hope," provide the philosophical underpinnings for evaluating the business of health care quality with balance and wisdom, despite the seemingly divisive concerns that often polarize the medical and business communities.

Point with pride

Our first directive, "pointing with pride," is a natural consequence of the current upwelling of interest and enthusiasm on the topic of health care quality. This subject has grown in the public awareness to the extent that it merits a publication such as this one, which brings together the cogent observations and opinions of a distinguished faculty of experts.

Certainly, the topics addressed here — including John Kelly's exciting research at Abington Memorial Hospital, the universal benefit of the computerized physician order entry system, the warfarin program, and the issues that Bruce Bradley raises relative to The Leapfrog Group, active care, and community initiatives — merit pointing with pride. Conveying excitement to the public about new and ongoing research, and about the ongoing progress that is being made in these areas, is an important challenge that this publication is helping to meet.

Throughout the United States, health care is a source of pride. For example, in the northeastern United States, the largest business sector is health care. In the metropolitan Philadelphia area, 1 out of every 17 people works in health care; locally, there is no economic power greater than that generated by the health care industry.

Further, it is clear that, while the economic aspects of health care are a source of much debate — and might even be "viewed with alarm" — it must be readily recognized that no other industry controls 16 percent of the gross domestic product of the largest economy in the world. That alone is worth pointing to with pride. The entrepreneurial spirit that gave rise to the program on which this publication is based is clearly alive and well.

Again pointing with pride, great opportunities exist for the future relative to provider and consumer involvement in health care.

View with alarm

Our second directive, "viewing with alarm," is also a natural consequence of the same factors that have spurred widespread interest in health care quality. One of the most readily apparent sources of alarm addressed in this publication is professional liability, which should be a primary concern of every provider, nurse, and pharmacist in this country.

Perhaps more disconcerting is the scarcity of specific answers to our questions about these issues raised by our colleagues in the

legal arena. The reality of the situation is that there are no ready responses to our professional liability questions.

The "no people to provide care means no care" issue is potentially devastating, both financially and in terms of health care quality, to physicians and patients alike. The professional liability situation is urgent in some regions, particularly, for example, in Pennsylvania, where malpractice insurance is extremely expensive and, in some cases, is unavailable to practitioners who have been sued only three or fewer times. Due to the malpractice situation, an increasing number of physicians, particularly specialists, are no longer practicing in the Keystone State.

Lillee Gelinas, of VHA Inc., provides stimulating insights into the connections between modifying nurse behavior, the organizational imperative, nurse turnover, and quality, which are all important components of the health care business model. These are crucial relationships to address. If there are no people to provide care, then there simply is no care, which certainly is worthy of viewing with alarm.

Professor Bill Kissick, from the Wharton School of the University of Pennsylvania, offers a valuable aphorism: "For every health policy action, there is a reciprocal overreaction." Why should this concept be viewed with alarm? This is clearly in evidence when a company spends $4.6 billion a year on health care. That may well be more than the gross domestic product of half the member countries of the United Nations.

Why is that worrisome? Consider the consequences if the country's top companies suddenly decide to overreact to the issue of health care quality in the United States. If the head of General Motors were to wake up and declare, "We make cars; we ought to get out of the health care business altogether," consider the consequences if Ford, Xerox, American Express, and the other top-100 firms all followed suit.

That is a distinct possibility, and something definitely worth viewing with alarm, for many of us. What would happen if, suddenly, millions of employees lost their health-plan benefits and were forced to provide their own coverage or simply do without?

Bruce Bradley, who contributes his expertise to this publication, speaks and understands the language of health care and understands what the health care economy is all about. Quite frankly, most plan purchasers are less visionary and see little beyond the cost of providing health care benefits to employees.

Just like the giant corporations, these smaller firms may eventually draw the conclusion that being in the health care purchasing business is simply counterproductive. When the cost of premiums increases 19 percent from one year to the next, the financial motivation to question the expense is obvious, and must be viewed with alarm.

Another situation that bears viewing with alarm is the well intentioned but potentially dangerous grassroots response — in a less politically correct environment, also known as a knee-jerk reaction — initiative to patient safety issues exemplified by the Leapfrog Group. Following the reports issued by the Institute of Medicine on medical quality and patient safety The Business Roundtable (BRT) launched its Leapfrog Initiative.

The BRT is an association of chief executive officers of leading United States corporations, which have a combined workforce of more than 10 million employees in the United States. It provides health insurance to about 25 million Americans and, according to material found on its Web site, «www.brtable.org», "is committed to advocating public policies that foster vigorous economic growth, a dynamic global economy, and a well-trained and productive U.S. workforce essential for future competitiveness."

According to information that can be found at its Web site «www.leapfroggroup.org», the Leapfrog Group is "a coalition of more than 100 public and private organizations that provide health care benefits," and was "created to help save lives and reduce preventable medical mistakes by mobilizing employer purchasing power to initiate breakthrough improvements in the safety of health care and by giving consumers information to make more informed hospital choices.

"It is a voluntary program aimed at mobilizing large purchasers to alert the health care industry that big leaps in patient safety and customer value will be recognized and rewarded with preferential use and other intensified market reinforcements."

From a hospital perspective, Leapfrog is a gigantic unfunded mandate. Neither CPOE nor having a full-time intensivist in the intensive care unit is, by itself, the answer to solving the complex problem of improving patient safety. Leapfrog is stimulating us to ask some of the right questions, but it is misleading to believe that initiating the Leapfrog program represents solutions to every hospital's problems and that if every hospital followed Leapfrog's recommendations, the problems would be solved. It simply is not so.

End with hope

Point with pride, view with alarm, and now, of course, end with hope. What really generates excitement is that people like Bruce Bradley are talking our language. He is saying that he is willing to do business with us, to learn about quality, and to purchase quality health plans. That provides a lot of hope for the future. We may disagree on which road to take, but if one of the world's greatest companies is interested in these issues, it behooves the rest of us to pay attention.

There are other causes for hope, as well, including the new tools, such as the ePocrates networking and database software for hand-held computers, which clinicians can use to prescribe medications more efficaciously. Also exciting is the entrepreneurial spirit being applied to health care, and the participation of many intelligent young people who will tackle some of these very vexing problems in the future.

In the last 50 years, every other industry has demonstrated that high-quality production costs less. Now we need to apply that research to health care.

If we deliver care right the first time, and do it right every time for the right patient — the right dose, the right indication — we can expect fewer complications, a shorter length of hospital stay, and a happier patient. It all makes perfect sense.

Two final factors that certainly give us hope for the future are the trust we can place in our younger physicians and the faith we can place in health care consumers, who will eventually figure out the health care quality issue. As they come to more fully recognize that high-quality care costs less, they will ask increasingly tough questions and demand that the system improve, for the betterment of all participants.

Consumers will foment change. They will work collectively through their companies and business coalitions, work individually, or work through their religious and/or social organizations to affect necessary change. Americans, who fuel the greatest capitalist engine in the world, will hold the health care industry accountable. They will be the principal force for the future. How we get there and how long it will take are the still-unknown variables.

The basis of all well-informed decisions lies in viewing multiple dimensions of any issue. The business of health care is founded on those informed decisions, which will serve to open new pathways to guide us into the future of quality care.

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	A.	B.	C.	D.	E.
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3.	☐	☐	☐	☐	
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8.	☐	☐	☐	☐	
9.	☐	☐	☐	☐	
10.	☐	☐	☐	☐	
11.	☐	☐	☐	☐	
12.	☐	☐	☐	☐	
13.	☐	☐	☐	☐	
14.	☐	☐	☐	☐	
15.	☐	☐			
16.	☐	☐	☐	☐	
17.	☐	☐	☐	☐	
18.	☐	☐	☐	☐	☐
19.	☐	☐	☐	☐	
20.	☐	☐	☐	☐	

PROGRAM EVALUATION

To receive continuing education credit, please answer all information requested below. This assures prompt and accurate issuance of your continuing education certificate.

Please rate this program as follows:

	Excellent	Very good	Good	Fair	Poor
Overall quality of program	5	4	3	2	1
Content	5	4	3	2	1
Relevance of content to objectives	5	4	3	2	1
Effectiveness of this format for learning	5	4	3	2	1
Value to me in my daily responsibilities	5	4	3	2	1

How long did it take you to complete this continuing education activity?

Hours _____ Minutes _____

Requested topics/skills to address in future programs:

_____

_____

Comments: _____

_____

Did you detect any bias in this presentation?

Yes ___ No ___ If yes, please explain:

_____

_____

CONTINUING EDUCATION QUESTIONS

Health Care Quality Means Business

Directions: Please tear out the combined answer sheet/assessment form on page 24. On the answer sheet, place an X through the box of the letter corresponding with the correct response for each question.

1. **Of the prescriptions for antibiotics recorded in GM's database of self-funded plans, _____ percent are prescribed inappropriately.**
   a. 60
   b. 10
   c. 50
   d. 40

2. **Which one of the following is not a Leapfrog initial safety leap?**
   a. ICUs staffed full-time with intensivist physicians
   b. Disease management programs for the top five chronic conditions
   c. Evidence-based hospital referrals
   d. Computerized physician order entry systems

3. **A survey by VHA Inc. has found that a low rate of employee turnover is associated with:**
   a. A higher return on assets
   b. A lower risk-adjusted mortality index
   c. A shorter severity-adjusted average length of stay
   d. All the above

4. **Which statement best describes the current and expected future state of the nursing work force?**
   a. There is a current shortage of nurses that is expected to be eliminated by 2015.
   b. There is a shortage of nurses now, and that shortage is expected to worsen between now and 2015.
   c. There is not yet a shortage of nurses, but a shortage is expected to develop by 2010.
   d. There is no shortage of nurses now, and none is expected to develop.

5. **Which of the following was not found by VHA Inc. to be one of the most common reasons cited by health care workers for leaving their position?**
   a. Dissatisfaction with their compensation package
   b. Dissatisfaction with their work environment
   c. Their relationship with their manager
   d. Their relationship with other staff members

6. **The Institute of Medicine has concluded that most medical errors are caused by:**
   a. Irresponsible individuals
   b. Flawed systems
   c. Illegible handwriting
   d. Incompetent individuals

7. **A means for reducing errors at all stages of the medication process is:**
   a. Mandatory handwriting classes for physicians
   b. Computerized physician order entry
   c. Computerized decision support
   d. Focused continuing education programs for pharmacists, physicians, and nurses

8. **At Abington Memorial Hospital, a Web-based system has been introduced to reduce morbidity associated with:**
   a. Aspirin
   b. Digoxin
   c. Insulin
   d. Warfarin

9. **The malpractice insurance crisis in Pennsylvania can best be described as one of:**
   a. Insurance affordability
   b. Insurance availability
   c. Answers a and b
   d. None of the above

10. **On average, hospitals and physicians are reporting their claims how many months prior to the limit indicated by the statute of limitations on filing claims?**
    a. One month
    b. 23 months
    c. 24 months
    d. None of the above

11. **Which factors contributed to the medical malpractice insurance crisis in Pennsylvania?**
    a. Intense competition among insurers and loss of customer loyalty
    b. Increases in the number of malpractice claims and decline in the stock market
    c. Key insurers leaving the state and unsuccessful tort reform
    d. All the above

12. **Which factor appears to have been least important in leading physicians to begin regular use of the ePocrates Rx software?**
    a. Word of mouth
    b. Personal experience
    c. Published data
    d. Perceptions of accuracy and value

13. **Which statement best describes the results from a study of Connecticut physicians who used the ePocrates Rx software?**
    a. Utilization shifted away from generic and preferred brands
    b. Utilization shifted toward generic and preferred brands
    c. Utilization shifted away from generics but toward preferred brands
    d. Utilization shifted toward generics but away from preferred brands

14. **Physicians' adoption of new information technology is most powerfully driven by which one of the following:**
    a. Economic pressures
    b. Peer pressure
    c. Quality of patient care
    d. Prior experience with information technology

15. **Patient safety can be enhanced and medical errors reduced through use of computerized physician order entry, clinical decision support, and bar codes.**
    a. True b. False

16. **In a stage-2 health care quality market, which one of the following does not apply:**
    a. Providers offer more intensive staff training
    b. Providers begin using technology to redesign systems
    c. Providers begin to investigate preventive risk strategies
    d. Providers engage in more intensive data collection

17. **The Leapfrog Group's computer physician order entry system does which of the following:**
    a. Allows physicians to submit prescription orders digitally
    b. Integrates prescriptions with patient information
    c. Prompts against drug interactions, allergies, and overdoses
    d. All the above

18. **Point-of-care technology has the potential to:**
    a. Improve convenience and adherence to plan provisions
    b. Identify potential drug interactions
    c. Reduce costs and inappropriate utilization
    d. Enhance quality of care
    e. All the above

19. **Six Sigma is a statistical standard used to characterize a near-perfect production environment, representing an error-free rate of:**
    a. 99.97 percent
    b. 99.9997 percent
    c. 99.9999 percent
    d. 99.997 percent

20. **An integrated networked platform permits Medco Health to do all but which of the following:**
    a. Redirect prescriptions to the facility at which they can be filled most quickly
    b. Answer member inquiries with greater speed and accuracy
    c. Offer patients a choice of Internet pharmacies at which to shop for discounts
    d. Free system pharmacists for clinical reviews and counseling

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TAP Pharmaceuticals Inc.

TAP PHARMACEUTICALS INC.
Lake Forest, IL 60045

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2002-010-40654 12/02
Printed in the U.S.A.