Clinical Technology: Are You Getting Your Money's Worth?

When investing in clinical information technology, providers need to consider intangible benefits and opportunity costs among other factors.

BY BARRY P. CHAIKEN, MD

Need overnight delivery? Chances are, FedEx comes to mind. Over the past 25 years, the shipping giant has become a formidable force in the next-day package delivery industry.

Yet despite expectations that the company's shrewd business people continually are running numbers and cranking out return-on-investment (ROI) studies, such is not always the case. As discussed in *The World on Time: The 11 Management Principles That Made FedEx an Overnight Sensation*, FedEx cannot perform an ROI study for every investment it makes—it is not practical to do so given the sheer volume and complexity of decisions that an organization of its size must make each day. Rather, effective decision-making requires acceptance that certain purchases are simply a cost of doing business and that overall commitment to one's market should drive key investments.

So, too, can this lesson be applied to health care. Providers often must make capital investment decisions without clearly defined ROI, particularly when it comes to investing in clinical IT.

ISSUES AND ACTIONS

Providers investing in a clinical information technology (IT) system should consider their organization's specific needs and those of the surrounding community.

- **Assessments of clinical IT value should take into account factors beyond cost savings.**
- **Providers should be aware of related tangible benefits, such as reductions in length of stay and enhanced administrative and clinical services.**
- **The capability of a clinical IT system to help prevent medical errors and improve operational efficiency should weigh heavily during a provider's assessment of whether to invest in the system.**

Rather than solely relying on quantification of costs and monetary benefits, healthcare providers should instead consider making decisions based on best estimations of their organization's and community's overall needs. When considering options, financial managers should incorporate general appreciation for the value of the investment, consideration of both tangible and intangible benefits, and an understanding of relative opportunity costs and competing interests.

An Inexact Science

Measuring value in health care is an inexact science. On the cost side, organizations traditionally have relied heavily on the medical care CPI to determine the change in cost of providing healthcare goods, including clinical IT systems. With this measure, the Bureau of Labor Statistics compares healthcare goods prices, using the years 1982-1984 as a baseline and assigning the value 100 as a reference point.

Although utilization of services is a primary driver of healthcare expenditures, it is not the only one. For example, consider the factors resulting in disparity between general and medical CPI growth. The annual percentage change in the general CPI has decreased from over 8 percent annually in 1982 to just under 2 percent today (see Exhibit 1). In contrast, the medical care CPI annual percentage change in 1982 was much higher than the general CPI annual percentage change, and continues at a higher relative percentage increase today (see Exhibit 2). One could conclude from these data that healthcare costs are increasing faster than the costs of other goods that make up the general CPI. But this conclusion does not account for additional factors that may be contributing to greater value in the healthcare services that are available today, relative to past services, including:

- Changes in the quality of the delivered service;
- Differences in treatment and their associated costs; and
- The provider's ability to prevent illness or morbidity.

Quality of service. Today, providers are able to bring patients to a state of wellness with better outcomes much more quickly than was seen 20 years ago. Therefore, what patients pay for health care today, although higher than 20 years ago, is not really comparable to what was purchased 20 years ago. The value of care today exceeds what was received in the past.

Differences in treatment costs. The medical care CPI is based on utilization and its associated costs. Yet calculating healthcare costs by simply adding up inputs, such as hospital days, physician visits, and drugs, does not take into account the fluctuations in the number of illnesses that occur each year and how well providers treat these illnesses. Inherently, some illnesses cost more money to treat than others. (See "Economists' Perspectives of Healthcare Value," p. 68)

Prevention of illness or morbidity. Ability to prevent illness also is important. For example, expenditures on immunizations to prevent polio should be countered with savings associated with preventing a case of polio.

As these considerations show, evaluating healthcare expenditures requires more than the raw numbers presented in spreadsheets documenting utilization and its costs. In addition to these cost calculations, financial managers also must weigh tangible and intangible benefits.

Tangible Benefits

Healthcare providers have long experience measuring the more tangible aspects of value in health care. Clinical IT is no different, delivering many quantifiable returns.

Reductions in length of stay. A long-time measurement of ROI has been length of stay. Whether changes in length of stay result from the introduction of a clinical pathway or modification of a hospital process, they easily can be measured in monetary terms and linked to a definitive impact on hospital costs. Even fractional reductions in length of stay can deliver significant financial benefits through both the reduction in cost per case as well as an increase in hospital capacity. The latter benefit accrues from a higher utilization of fixed assets and costs (e.g., hospital facility, equipment, and staffing expenses).

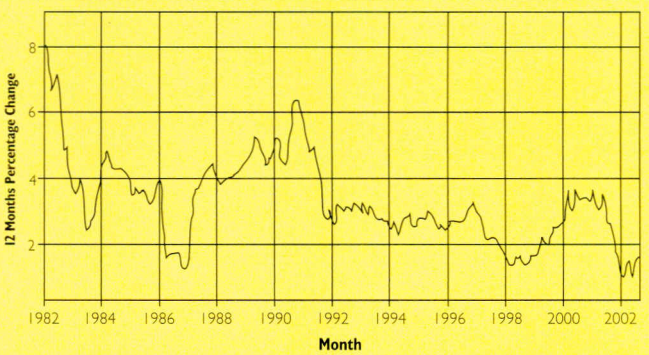
With the number of hospital beds decreasing and demand for the remaining beds rising, hospitals that capture the increasing demand for services with existing infrastructure obtain a significant financial advantage over competitors.

Examples of clinical IT systems that help reduce length of stay include computerized physician order entry (CPOE)/clinical decision-support systems and physician portals. These systems facilitate putting patients on treatment regimens that are more likely to get them well quickly. With physician portals, physicians use web technology to access accurate, up-to-date patient information. This capability allows physicians located offsite to respond quickly to changing clinical data.

Although identifying changes in length of stay due to clinical IT solutions, such as a physician portal, is not without its methodology challenges, healthcare providers can statistically adjust for the intervention and supplement that information with survey data obtained from physicians.

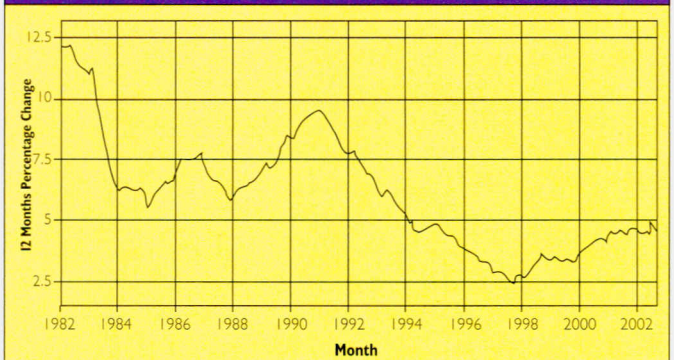
Staffing efficiencies. Properly deployed clinical IT systems provide staffing efficiencies that allow a fixed number of staff members to treat a greater number of patients. Efficiencies occur through improved

EXHIBIT 1: PERCENTAGE CHANGE IN CONSUMER PRICE INDEX, 1982-2002



Source: U.S. Bureau of Labor Statistics

EXHIBIT 2: PERCENTAGE CHANGE IN MEDICAL CARE CONSUMER PRICE INDEX, 1982-2002



Source: U.S. Bureau of Labor Statistics

Economists' Perspectives of Healthcare Value

More than 40 years ago, economist Anne Scitovsky proposed the development of separate indexes to identify treatment costs associated with specific illnesses. These indexes are then combined into a composite index, which weights the specific index of each illness for a base year.

Scitovsky's index not only reflects annual fluctuations in the incidence of each disease, but also helps account for reductions in length of stay associated with advances in treatments and technology. With traditional calculation methods, measurement merely reflects the total cost per inpatient day.

Furthermore, Scitovsky's index reflects treatments that reduce morbidity and mortality. For each index, a single objective indicator of quality is chosen. This indicator is then used to adjust each illness index before calculation of the composite index.

Economist Yoram Barzel built on Scitovsky's model, suggesting that prevention of disease be calculated in the composite index as well. As healthcare economist Paul Feldstein has stated, "The prevention of a case or illness clearly represents an output that is superior to the successful treatment of a similar case, but if we concentrate on the costs per case of treating specific illnesses when they occur, we ignore the influence of preventive medical care."

communication of treatment plans, reductions in time spent clarifying orders, and the elimination of unnecessary efforts. For example, CPOE/clinical decision-support systems deliver to each staff member the exact assignments that require completion for each patient. Each staff member can then organize the workload to maximize efficiency. In addition, treatment errors that result from such things as the inability to read someone's handwriting are eliminated.

Improved adherence to medication protocols. Changes in practice patterns, particularly in drug use, can decrease the cost of treatment. Some organizations successfully reduced antibiotic and anticoagulation drug costs by deploying a CPOE/clinical decision-support system that uses evidence-based medicine guidelines when providers enter orders at the point of care. These systems not only increase compliance with the hospital formulary, but they also direct physicians to the appropriate, least expensive medication that can deliver the desired outcome. As an added benefit, reviewing and limiting antibiotic use in this way also reduces the potential for antibiotic-resistant pathogens.

Eased regulatory reporting. Clinical IT systems can assist in regulatory and accreditation reporting to CMS and the Joint Commission on Accreditation of Healthcare Organizations. These systems provide much of the required information through analysis of existing patient data sets. Having this information available reduces the time staff spend pulling records and compiling disparate data elements. It is likely that as more clinical IT systems are deployed, regulatory and accreditation standards will adjust and take advantage of the available reporting capability.

Physician referrals. Lastly, properly chosen and deployed clinical IT systems help to improve medical staff relations by facilitating physician workflow and satisfying the information needs of the practicing clinician. As the environment becomes more functional, physicians are more likely to refer patients to the institution. These increases in referrals lead to higher occupancy rates and better utilization of fixed assets, culminating in improved hospital cash flow and net revenue. To help measure these benefits, one organization that deployed a physician portal tracks changes in referrals through utilization statistics supplemented by regular surveys of its medical staff administered through the portal.

Each clinical IT system deployed has the potential of providing some or all of the tangible benefits noted above. The actual benefits and cost savings (or increased revenue) vary by the choice of system and method of implementation. Therefore, actual ROI is greatly influenced by the clinical processes associated with the deployed systems.

Intangible Benefits

Healthcare economists have struggled for some time over the measurement of intangible benefits. Putting a financial value on morbidity or mortality is fraught with nuances, value judgments, and arguable errors. Nevertheless, these intangibles have value.

Error prevention. Reduction in medical errors and associated costs is the primary intangible benefit that

Recommended Reading:

Chaiken, Barry P., "Physician Adoption of Technology Linked to Providing Benefits," *Journal of Quality Health Care*, April/June, 2002, p. 25-27.

Feldstein, Paul J., *Health Care Economics, Fifth Edition*, John Wiley and Sons, New York, 1998.

Kohn Linda T.; Corrigan, Janet M.; Donaldson, Molla S., *To Err Is Human: Building a Safer Health System*, Institute of Medicine, National Academies Press, Washington D.C., 1999.

accrues from implementation of clinical IT systems, due to real-time alerts, enhanced tracking of errors, and the incremental improvement of clinical processes. Even more difficult to measure are the savings resulting from errors that are prevented or morbidity and mortality that are avoided because of these features.

Today, data elements never before available can be tracked and interventions made before serious problems appear in patient care. Moreover, ordering patterns of physicians can be tied to patient outcomes to identify treatment plans that deliver the best results.

Current surveillance of clinical processes and potential medical errors is inefficient and often nonexistent in hospitals that lack sufficient clinical IT systems. Irrespective of commitment to patient care, such organizations just do not have the readily available data necessary for optimum quality-of-care monitoring.

Goodwill. Lastly, the most difficult intangible benefit to measure is probably goodwill. Hospitals exist to serve their community. Their boards of trustees, senior management, and clinical staff are committed to providing the highest quality and safest patient care possible to the neighborhood they serve. When making a decision to invest in a clinical IT system, it is difficult if not impossible to put a monetary value on the community goodwill generated by the system's contribution to enhanced patient safety. Therefore, goodwill is almost always left off the equation.

Competing Opportunities

Every investment decision carries an opportunity cost with it. Therefore, decisions to invest in clinical IT systems should not be driven solely by ROI calculations, but by broader determinations on what investment best appropriates resources to meet the goals of the organization.

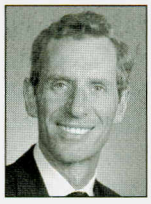
Providers must be attentive to the prevailing environment. Payer requirements, competitors' capabilities, and clinical staff interests all contribute to the value of an investment.

As resources vary greatly among organizations, program funding will reflect this reality. For example, some organizations with tight budgets may choose to continue to provide indigent care rather than make an investment in IT; others with greater institutional endowments will have the luxury to do both. Clearly, attention to competing interests must weigh in any clinical information system investment.

Finding Balance

When it comes to making clinical IT investments, organizations should go beyond traditional measures that weigh monetary costs versus quantifiable benefits. Overall value—in terms of a clinical IT system's ability to hasten the healing process, improve delivery of medical care, or promote goodwill—also should be part of the equation. Only by considering these and many other potential value factors can providers determine which systems meet their specific organization's needs and the community at large. ■

ABOUT THE AUTHOR



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