e-Health in Massachusetts

Executive Summaries

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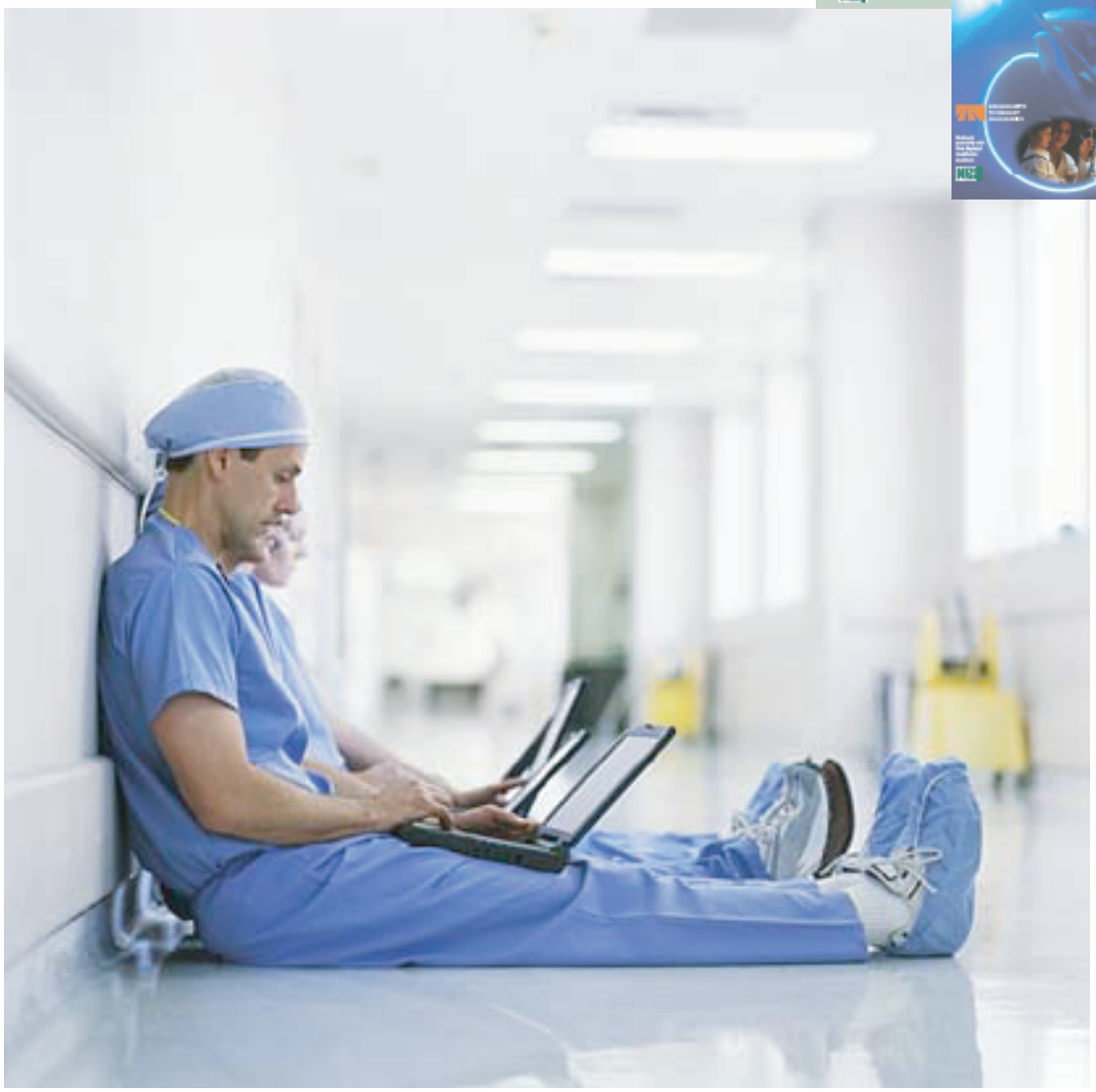

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Executive Summary

What if we could both improve the quality of medical care and decrease its costs by bringing 21st century technology to health care?

If CPOE systems were operating in all acute care hospitals in Massachusetts, patient safety and the quality of patient care could be greatly improved, and costs could be substantially reduced. Yet now, in 2004, **70 percent of all Massachusetts hospitals — 46 institutions — do not have this essential technology.**

The Massachusetts Technology Collaborative (MTC) and the New England Healthcare Institute (NEHI), in conjunction with First Consulting Group (FCG) and a Working Group broadly representing the state's health care system (see inside cover), concluded that **fully implementing CPOE programs in all of the state's acute care hospitals has the potential to reap $275 million in net cost savings annually to the state's health care system.** Full installation of CPOE systems could be completed for a capital expenditure of $210 million.

So if a $210 million investment can generate on-going savings of $275 million, not to mention significantly improve patient safety and care, what's keeping that investment from happening? This Case Statement first explains the barriers that currently impede the implementation of CPOE systems, and then proposes a solution to these problems. We identify a framework and pathway for universal adoption of CPOE systems in all Massachusetts hospitals.

THE STATE OF THE ART

CPOE Adoption Rates in Massachusetts' Acute Care Hospitals are Very Low

Today, just 10 percent of Massachusetts' acute care hospitals have CPOE systems installed and operational. Another 20 percent are currently in the process of implementing systems. Most often these are the large tertiary care hospitals. The remaining 70 percent of the state's acute care hospitals, typically those with fewer than 500 beds, do not have CPOE systems.

But Why? Barriers to Adoption of CPOE

This is no easy task. There are three significant barriers that hinder the adoption and implementation of CPOE:

- A CPOE system is a major IT installation. Costs can be substantial and may present a significant, and in many cases, overwhelming challenge. Up to this point, it has been difficult to quantify the anticipated savings from implementing such systems, and equally hard to determine to whom the savings accrue (payers vs. providers).

- Resistance to CPOE systems among clinical and administrative staff remains a significant barrier to adoption. Implementation of a CPOE system results in major changes in the work processes of a hospital. Not only is it disruptive, it also requires a reconfiguration of hospital operations and a willingness on the part of the staff to accept change.

- Up to this point, there have been no clear specifications and standards regarding the capabilities and performance of CPOE systems, or guidelines regarding best practices for installation and implementation.

Costs and Savings for Statewide Implementation

If standardized CPOE systems were installed in each of the 46 Massachusetts hospitals currently not using this technology, total one-time installation costs would be approximately $210 million. Conservative estimates and accepted studies show total net savings to the health care system in Massachusetts to be at least $275 million annually. Of this amount, $175 million would accrue to the hospitals, and the balance of $100 million to payers and patients.

CLEARING THE PATH AHEAD: Removing the Barriers

- Standards: The Case Statement presents a full set of minimum application and performance standards for Massachusetts hospital CPOE systems. Best practices to insure successful implementation are also outlined.

- Funding and Incentive Model – A "Straw Man": Meeting the substantial and in many cases overwhelming capital requirement is critical. And a program of incentives could greatly speed implementation of standard, interoperable systems. As a "straw man" the Case Statement proposes that all payers (health plans, employers, Medicare, and Medicaid) agree to a collaborative approach in which **half of all project costs** would be provided by payers. This support would be made available in two parts: half as a grant paid over project implementation, and half contingent, to be paid depending on the achievement of performance metrics.

Governance, Organization and Resources

In addition to the hospital CPOE project, there are a number of parallel and closely related projects underway. Blue Cross Blue Shield of Massachusetts (BCBSMA) is leading an effort to implement a comprehensive system of standardized Electronic Medical Records (EMRs) across all provider settings in the state, and the American College of Physicians (Massachusetts Chapter) has developed a roadmap and collaborative initiative for the universal installation of EMRs in all of the state's ambulatory settings.

Substantial resources have been committed in support of these efforts. In addition to its planning and organizational resources, Blue Cross has pledged $50 million toward these combined initiatives. In addition, approximately $1 million has been committed to the hospital CPOE project by the Massachusetts Legislature and MTC.

A centralized, statewide governing entity, representative of all stakeholders, has been formed and will manage these combined initiatives in a project called the *Massachusetts e-Health Collaborative*. Planning for the "pilot" phase of this effort is already underway.

Next Steps

This Case Statement presents a compelling case for a broad-based collaborative effort to install CPOE in all the Massachusetts hospitals that do not now have these systems. But it is only an initial framework and pathway. As part of the Massachusetts e-Health Collaborative, the CPOE initiative should undertake detailed planning and analysis to include refinement of specifications and standards, negotiation with key vendors, agreement among stakeholders on specifics of a funding and incentive program, and a project timetable. Planning and implementation should be integrated with the "pilot" phase of the e-Health Collaborative as appropriate, and thereafter carefully sequenced with other elements of the comprehensive effort to maximize the effectiveness of a state-of-the-art, interoperable, state-wide system.

EXECUTIVE SUMMARY

"There are advanced technologies which can dramatically lower health care costs and improve quality. The technologies are proven. The associated benefits are known. But there are barriers in the system which impede their implementation. We can change that."

Mitchell Adams – Executive Director, Massachusetts Technology Collaborative

Massachusetts is home to a life sciences "Super Cluster" consisting of an extraordinary aggregation of the world's leading institutions and companies in biomedical research and education, health care delivery, medical devices, biotechnology, pharmaceuticals, and information technology. It is the envy of the world, and an essential element in our region's future economic vitality.

"The return of double-digit health care inflation threatens employers' ability to preserve jobs while maintaining good benefits, and has a severe impact on the Commonwealth's industrial competitiveness. "

Richard C. Lord – President and CEO, Associated Industries of Massachusetts

But while we have what is arguably the best health care available, the cost of services is very high, and annual increases have recently returned to the double-digit range. It is a national problem. Growth in health care spending in the United States has outpaced all other major sectors and threatens to reach crisis levels. In 2001, $1.4 trillion was spent on health care [1] – an amount that represents 14.1 percent of gross domestic product (GDP) and an increase of 8.7 percent over 2000. It is expected that health care costs could grow to 17.7 percent of GDP by 2012. [2] And the expenditure category presenting the greatest stress on state budgets currently is health care costs.

At the same time, the quality of our health care system suffers as a result of medical errors, fragmented care and inadequate systems. Widely cited estimates from the Institute of Medicine report, To Err is Human, indicate that the cost of medical errors in terms of human life is substantial. Other studies have shown that the financial cost is huge. The total costs associated with these events – including all health care costs, disability, lost productivity and income – could reach $29 billion. [3]

There exist advanced technologies which can dramatically lower health care costs and improve quality. While capital expenditures for equipment and training are required, the cost savings associated with implementing these technologies going forward can be much greater, such that substantial net financial benefits are possible. These technologies cross a spectrum of disciplines including biotechnology, medical devices and information technology.

This report focuses specifically on a set of seven advanced technologies that have demonstrated substantial net financial benefits and improved quality of care and health outcomes. They were selected from among a wide array of technologies for their demonstrated ability to simultaneously reduce costs and improve quality. They represent only a sample of all of the technologies that could benefit health care in Massachusetts. Technologies with the potential to yield dramatic administrative savings but no direct clinical benefit, for example, have not been addressed here. There are a host of non-information-based technologies that also

have dramatic effects. *(See Appendix A for a more complete list.)* The seven selected information-based technologies are highlighted here and discussed in more detail in subsequent sections of the report.

1. **Electronic communication between patients and their physicians** has been shown to measurably decrease overall claims costs while improving patient access and communication and enhancing practice efficiency. As a result, at least six payers – including, locally, Blue Cross Blue Shield of Massachusetts – have undertaken pilots to reimburse physicians for their use of electronic communication tools with patients for the delivery of non-urgent care.

2. With over one billion prescriptions worth $154 billion written in the United States in 2001 and three million preventable adverse drug events associated with outpatient prescriptions alone, [1] there are significant opportunities to reduce drug costs and the errors associated with the largely manual process that takes place today. More importantly, medication errors account for one out of 131 ambulatory deaths and one out of 854 inpatient deaths. [3] **Electronic prescribing** (or e-prescribing) tools that provide up-to-date payer formulary information at the time a physician writes a prescription, and that support the electronic transmission of that legible prescription to a pharmacy, can markedly reduce drug costs and improve patient safety associated with the prescription process. A coalition in Rhode Island is currently piloting an e-prescribing solution for statewide implementation, [4] and Tufts Health Plan has announced the expansion of its e-prescribing pilot across Massachusetts.

3. **Ambulatory computerized physician order entry** (CPOE) systems that facilitate physician orders at the point-of-care for medications, laboratory and radiology tests provide significant opportunities for improving quality while reducing costs. It is estimated that the use of advanced ambulatory CPOE systems nationwide could eliminate more than two million preventable adverse drug events. [1]

4. Similarly, point-of-care tools that provide **inpatient CPOE** can reduce errors, improve health care quality, and lower costs in the hospital setting. Preventable adverse drug events are a leading cause of death in the United States (exceeding deaths attributable to motor vehicle accidents, breast cancer, or AIDS). The total costs associated with such events represented four percent of national health expenditures in 1996. [3]

5. Coordinating patient care across a community when patients are seen at multiple provider organizations – especially when many of these institutions do not have electronic patient records – can be paper-intensive and fraught with rework and delays. Several communities across the country have been piloting efforts to share electronic patient information by secure means. The results from these two early **regional data sharing** initiatives (in Santa Barbara, California, and Seattle, Washington) have shown some early success in improving quality and reducing health care costs in the community. A similar effort is just now being proposed for Massachusetts.

6. A recent mandate by the Leapfrog Group (a consortium of 140 public and private employers and organizations that provide health care benefits) requiring hospitals to maintain a board-certified intensivist onsite 24x7 to monitor intensive care units (ICUs), represents a significant investment for smaller hospitals with lower volumes of ICU patients. [5] New technology allows physicians to fully monitor patients remotely, thereby

reducing costs by expanding the ability of one intensivist to cover multiple ICUs using remote monitoring or **e-ICU** applications.

7. There are a wide range of tools that support the management of chronic diseases. Not only have **disease management** applications been shown to increase patient involvement and therefore satisfaction with their overall care, but the most sophisticated tools integrated with a physician practice's core clinical systems have been shown to effectively improve the quality of care for these patients and reduce costs for populations of patients across a community.

Published research and current uses of these technologies at leading health care organizations across the country have demonstrated their ability to reduce costs and improve quality. Indeed, if Massachusetts were to increase adoption of these technologies statewide, there would be an opportunity to significantly reduce health care costs for employers throughout the Commonwealth while simultaneously improving the overall health care of its citizens.

For Massachusetts alone, the potential for savings is enormous. It is estimated that $2.5 billion could be saved if the Commonwealth were to widely adopt all seven of these information technologies. Given the significant concentration of nationally-recognized health care organizations, the power of the political infrastructure, and the demonstrated history of success in collaboration, Massachusetts is certainly poised to undertake the planning and collaboration necessary to increase adoption of these technologies. Given the importance of a vibrant business economy to the long-term future of Massachusetts, the Commonwealth can ill afford *not* to increase adoption of these technologies.

The following table highlights the financial benefits that each of these technologies represents for Massachusetts, calculated for the purposes of this analysis at a likely best-case adoption rate of 75 percent.

Table 1: Summary of Projected Net Savings for Massachusetts from Emerging Health Care Technologies [6]

Emerging Technology	Projected Net Annual Benefit (Assuming 75% Adoption Rate)
Electronic Patient-Physician Communication	***$ 167.8 million***
E-Prescribing	***$ 140.7 million***
Ambulatory CPOE	***$ 290.3 million***
Inpatient CPOE	***$ 966.0 million***
Disease Management	***$ 710.0 million***
Regional Data Sharing	***$ 23.8 million***
E-ICU	***$ 177.4 million***
Total	***$ 2.48 billion***

Barriers that Impede the Adoption of Emerging Information Technologies in Health Care

Compared to other industries, spending on information technology in health care lags. Despite growing evidence of the effectiveness of electronic medical record systems for outpatient practice, it is estimated that less than one-in-five primary care physicians use them. Less than ten percent of primary care physicians use even more basic systems that support electronic prescribing. [1] And fewer than five percent of hospitals are using computerized physician order entry systems, [5] although the benefits associated with the use of these systems have clearly been demonstrated.

Barriers to the adoption of these technologies include:

- **There is a lack of information about true costs, benefits and experience associated with these technologies**. The resulting uncertainty is a **major barrier** to organizational adoption.
- In many cases, the **purchase and implementation costs** for these advanced technologies are significant – especially when the competition for capital dollars is tight and operating margins are shrinking at most health care organizations.
- For many of these advanced technologies, **the benefits do not accrue to the purchasers who use them**. While measurable financial savings from population health management and the improved formulary compliance accrue to payers, for example, the provider organizations that must actually use advanced technologies to achieve these improvements are unlikely to invest their limited resources to purchase them, especially when they receive no reimbursement, no reward and little direct benefit for doing so.
- **Performance standards** detailing best practices and outcome expectations in most cases have not been established.
- The **cultural resistance and inertia** against physician adoption of these advanced technologies can be great if use of them takes more time or represents significant change in the way a physician practices. Training and education are necessary.
- In many cases, the **vendor products are immature**, making the selection of a vendor riskier and implementation more complicated.
- In the case of several of these advanced technologies, **legal and regulatory barriers** – e.g., those associated with patient privacy and use of the Internet for transmitting personal health information, or requirements for actual as opposed to electronic signatures on prescriptions – have prevented more rapid adoption.
- Finally, the required **infrastructure and data/terminology standards** necessary for the interoperability of some of these advanced technologies are not yet present. Unlike other industries that long ago established technology standards, connecting disparate systems and exchanging information across multiple entities in health care is still an extremely complicated endeavor.

Recommendations: A Call to Action

Increasing the adoption in Massachusetts of these advanced health care technologies will require vision, leadership and collaboration among key stakeholders from across the Commonwealth. While a number of pilots and demonstration projects are already underway, (see “Case-in-Point” highlights), the success of these efforts must be publicized and their wider adoption nurtured if they are to take hold. Similarly, getting newer, yet-to-be-piloted technologies off the ground will also require vision, leadership and collaboration. In both cases,

leaders in Massachusetts must facilitate the creation of rewards and incentives and eliminate key barriers so that current initiatives can proceed more effectively and new efforts can begin.

There are some specific actions that could be undertaken to help spur adoption.

1. **Organize the initiative, foster collaboration and eliminate barriers** by:

   - ***Charging a statewide public/private task force, or series of focused task forces*** to develop specific recommendations for action within three to six months; and
   - When the work is done, ***convening a statewide summit*** to share the vision with key stakeholders and generate commitment and energy for the new agenda.

2. **Establish early funding, reimbursement and other incentives** by:

   - ***Implementing bonus incentives*** for provider organizations that adopt certain technologies, or base a portion of their capitation payment on IT adoption;
   - ***Reimbursing physicians for using technology*** on a per-visit or per-transaction basis;
   - ***Developing collaborative arrangements between payers and providers*** to share in the costs of implementing these advanced technologies (i.e., **eliminate the *disconnect* by aligning the cost burden with financial benefit**);
   - Using the state Department of Public Health ***licensing process*** to encourage hospitals and physician practices to adopt certain technologies; or
   - Working with the "Leapfrog Regional Rollout Committee" to ***speed up the adoption timeline and associated requirements for CPOE***. Accelerated implementation should be accompanied by financial assistance to meet capital needs where necessary.

3. **Secure capital funding** by:

   - ***Seeking private foundation and grant funding*** to design, test and implement pilots of emerging technologies across the Commonwealth;
   - ***Seeking sources of public funding*** for specific IT initiatives in Massachusetts (such as that proposed nationally in at least one instance to provide physician reimbursement for the adoption of technologies such as e-prescribing);
   - ***Providing low- or no-cost revolving loans*** to provider organizations for the adoption of certain technologies (such as one Federal proposal being urged by several national health care IT organizations);
   - ***Reallocating financial savings*** to those who implement these advanced technologies but for whom significant benefits do not accrue (i.e., **eliminate the disconnect**); or
   - ***Sharing technology resources*** across stakeholder entities.

4. **Establish a "trusted third party"** to complete studies to provide data and standards to identify the technologies that can reliably lower cost and improve quality. This addresses one of the significant barriers – the lack of information about true costs, benefits and experience.

This Initiative in Context

It is not news to many of the state's health care leaders that there are advanced technologies that can lower costs significantly and improve quality. In fact, there are a number of important projects and pilots underway in Massachusetts right now in which the power of these technologies is being put to work. Some examples are identified in the report, in particular those highlighted in box frames entitled "A Case-in-Point".

The contribution of this initiative nonetheless may be substantial. This report shows that there is very significant financial benefit to Massachusetts if the adoption of these technologies can be hastened, that there are systemic barriers impeding their adoption, and that a collaborative effort to eliminate the obstacles can be undertaken.