E-Rx Collaborative, E-Prescribing: A Bridge to the 21st Century

E-Prescribing has the potential to provide a bridge that will facilitate a transformation in health care delivery, which will have a remarkable impact on quality, safety, efficiency, and ultimately the value delivered by the health care system.

Robert Mandel, M.D., BCBSMA
Philip Boulter, M.D., Tufts Health Plan

I t is easy to point to the remarkable advances in medicine that have transformed health care over the past 125 years. In fact, over this period the pace of change has accelerated both in health care as well as a myriad of other facets of modern life. It is estimated that the half-life of medical knowledge is less than 18 months and this has created a huge challenge for practitioners and the health care system with respect to channeling new information and technology to the front lines of the delivery system.

Perhaps what is more remarkable are the aspects of health care that have not changed. Many physicians continue to practice alone or in small groups and in small offices that utilize new technology in a very limited way. While most have computerized billing systems, few use automation technology to assist in the delivery of care. Physicians continue to write by hand prescriptions on pieces of paper that are carried to the pharmacy where the medication is dispensed.

E-Prescribing introduces what would now be considered everyday technology into a process that has changed little in the last 100 years and offers the potential of dramatically improving safety and efficiency. More importantly, e-prescribing has the potential to provide a bridge that will facilitate a transformation in health care delivery, which will have a remarkable impact on quality, safety, efficiency, and ultimately the value delivered by the health care system.

We believe that electronic prescribing, in addition to having significant inherent benefits, may also serve as a catalyst that will promote the adoption of additional technological tools such as the development of an electronic medical record (EMR) as well as computer-based decision support systems. Independent e-prescribing pilots performed by Tufts Health Plan (THP) and Blue Cross Blue Shield of Massachusetts (BCBS-MA) over the past several years have confirmed our assumptions about the benefits this technology

has with respect to quality, efficiency, and in improved prescribing patterns.

The observations made during our pilot programs, as well as our belief in the potential that this technology has to move our health care market toward significant adoption of other technology, including EMR and decision support, prompted us to develop a collaborative program designed to promote adoption of e-prescribing technology by Massachusetts' highest prescribers. This article will discuss the information and observations derived from our pilots as well as the design and the initial results from our collaborative program.

Assumptions About the Benefits of e-Prescribing

E-prescribing technologies began to appear in the late 1990s and we and others anticipated that they could provide significant benefits for health plan members and physicians, especially in the areas of patient safety, physician and pharmacy efficiency, and cost reduction.

Patient Safety and Convenience

The landmark Institute of Medicine (IOM) study "To Err is Human: Building a Safer Health System," published in 2000, revealed that over one million preventable medication errors are made each year. A significant number of these errors result in serious complications and death. A Journal of the American Medical Association study estimated that more than half of medication errors can be attributed to inadequate access to clini-

Robert Mandel, *M.D., vice president of Provider Enrollment and Services with BCBSMA, is responsible for provider service call center and enrollment and credentialing activities and participates in the development of e-commerce capabilities that will enhance the partnership between BCBSMA and the provider community. He holds an M.B.A. from the Wharton School of Business.*

Philip Boulter, M.D., *is senior vice president and chief medical officer for Tufts Health Plan with responsibilities for strategic planning, medical management, and clinical services. He is also medical director at the Tufts Health Care Institute at Tufts University Medical School and is an associate clinical professor of Family Medicine and Community Health at Tufts University School of Medicine.*

... on average, physicians would change eight treatment decisions a day if they had the time to rigorously research each patient.

cal data and knowledge. This supports the finding that, on average, physicians would change eight treatment decisions a day if they had the time to rigorously research each patient. With the average office visit time for many physicians only seven to 12 minutes, any technology that makes clinical data readily available and reduces the time a physician needs to spend accessing data can mean more time with the patient, and potentially, better care.

Physician and Pharmacy Efficiency
Physicians receive more than 150 million callbacks per year from pharmacists regarding clarification of prescription information. If e-prescribing could reduce the number of callbacks for resolution of ambiguities (e.g., pills vs. capsules proper dosing) or other concerns from the pharmacy, it could save both physician and pharmacist potentially hours every day.

Cost Reduction
With health care costs continuing to escalate and challenging the affordability of health care, the entire health care industry is being forced to streamline, monitor, analyze, and report on all the cost of the business. If e-prescribing could communicate cost-saving information at the point-of-care delivery, such as alternative medications in a therapeutic class, then health plans, physicians, and patients could work together proactively to reduce health care costs.

Other Environmental Factors
Environmental factors intensified our need to find solutions as our organizations coped with similar challenges.

Aging demographics – The 55- to 65-year-old age group will increase more than 60 percent by 2015. This aging population will represent increased drug utilization, with multiple medications for long periods of time to treat age-related chronic illness, such as heart disease, diabetes, and cancer.

Tighter regulatory environment – All care delivery organizations need to reduce preventable medical errors by at least 50 percent during the next five years in response to the IOM's

studies and to meet regulatory, accreditation, and legislative demands.

Emergence of technology in health care – Extending information technology to the point of care enables physicians, pharmacies, and payers to evolve the way they conduct their businesses to meet the above challenges.

Assumptions confirmed by pilot projects – THP and BCB-SMA independently concluded that the possible benefits of e-prescribing could help resolve important service quality and environmental issues and therefore merited further investigation.

Study Method
- Distribution of PocketScript to participants from April through December 2001.
- Pilot measurement ceased May 31, 2002.
- Matched case/control, pre-and post-study design.

Study Population
- 15 physician sites
- 113 THP network providers

Overall Satisfaction Ratings (5-point scale, 5 = very satisfied)
- Prescribers – average rating of 4.25
- Office personnel – average rating of 4.10
- Pharmacists – average rating of 4.67

Excerpts of Study Findings
Improved patient safety
- Patient safety errors were reduced by 8.93 per physician per year.
- Emergency department visits decreased in the pilot group while increasing in the control group.

Examples of improved overall patient care
- The identification of a diabetic who had not picked up the previous two months' supply of insulin.
- The identification of a patient not taking the prescribed dosage correctly.

Improved prescriber/pharmacist efficiencies
- Prescribers reported a decrease of up to two hours per day in total time spent on prescriptions.
- Pharmacists reported saving almost an hour per day because of e-prescribing.

Improvement in health care spend
- Although medical costs increased for both groups during the study period, the increase for the pilot was 19.3 percent less than the control group.
- An increase in generic prescribing coupled with prescribing of preferred drugs yielded pharmacy cost savings from $0.30 to $0.40 per member per month.

Figure 1   Tufts Health Plan e-Prescribing Pilot Study

In the last few years, both organizations implemented pilot studies to evaluate the actual benefits of e-prescribing.

Tufts Health Plan Study

AdvancePCS, THP, and PocketScript collaboratively launched a pilot program whereby PocketScript software was distributed to THP network providers on PDAs.

PocketScript is an e-prescribing system that enables physicians to electronically write and fax prescriptions from the physician's handheld device to the pharmacy. The e-prescribing system identifies possible drug interactions and supplies formulary information for all health plans to prescribers. In addition, some of the prescriber sites participating in the pilot were able to view patient drug history via a link to AdvancePCS. Due to the results of the pilot study summarized below, THP decided to implement e-prescribing with a wider group of providers.

Blue Cross Blue Shield of Massachusetts Study

The BCBSMA study began in 2002 and will end in fall 2004 with 184 participating prescribers. Most study participants are members of our Provider Technology Council or were selected by the provider relations managers as those who might be interested in e-prescribing technology. Coincidentally, BCBSMA also chose to collaborate with PocketScript for our study.

Pilot results will not be tabulated until program completion; however, initial reports are highly positive for those who embraced the e-prescribing technology. A number of physician groups have said they could never go back to the old way of prescribing. In addition they note that their patients really like it as well. From anecdotal information, we know that the system has alerted physicians to a number of potential drug interactions as well as provided medication history information that the patient had forgotten to mention.

On the cost side we know that approximately 2.5 percent of the prescriptions being written electronically are modified by the physician during the prescribing process based on real-time

The joint e-Rx Collaborative is currently composed of three key players, each with core responsibilities and interdependencies detailed below.

ZixCorp™ Zix Corporation provides solutions worlwide that protect, manage, and deliver sensitive electronic information. These include care delivery solutions for e-prescribing and e-consulting that enable physicians to leverage technology for better patient care. By offering a comprehensive set of services, ZixCorp also protects organizations from viruses and spam and provides the management tools needed for

Tufts Health Plan's mission is to set the standard for outstanding quality health care, service, and value. Tufts Health Plan's HMO was founded as a not-for-profit Massachusetts corporation in 1979 and licensed as an HMO in 1981. Since then it has expanded into a family of companies, offering a full array of health care coverage options to individuals and employer groups. Tufts Health Plan currently has
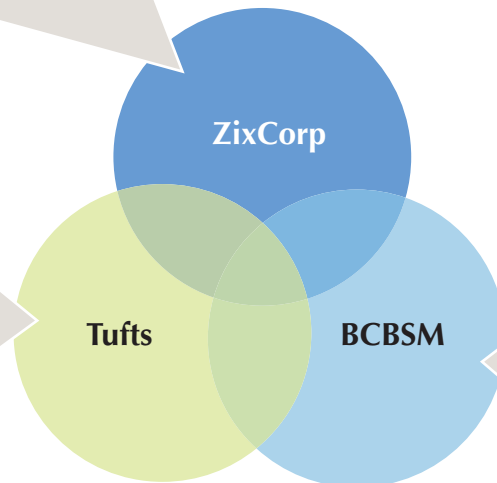
Blue Cross Blue Shield of Massachusetts is an independent, not-for-profit multifaceted health care company providing a wide range of health care programs and educational services for 2.5 million members. Members receive health care coverage through a range of employer-sponsored group plans, non-group plans and senior citizen programs that support its corporate goal "to always put members first."

ZixCorp

Tufts

BCBSM

Figure 1   The Key Players in the e-Rx Collective

information provided regarding formulary status and coverage. In comparing the prescribing patterns of the pilot participant against our network as a whole, we have seen a substantial increase in generic utilization. If this pattern holds as we expand the program, it will result in substantial savings in pharmacy costs which will ultimately translate into lower rates of premium

and that if they are not using it the program will remove the hardware and provide it to another participant.

The application and technology provide participants with the ability to write prescriptions from their respective handheld devices as well as on a browser version of the software from any computer that has Internet access. It provides real-time eligibility

The application also provides a comprehensive drug reference tool and automatically checks for drug-drug interactions between previously prescribed medications and the medication being prescribed presently.

increases for our customers. As a result of the positive feedback we received from participants, the implications for patient safety, and the early indications regarding impact on medical expenses, we decided not to delay implementation of the e-prescribing solution with a larger group of providers.

The e-Rx Collaborative

- The e-Rx Collaborative was formed in October 2003, and is a natural outgrowth of the plan's respective pilot activities;
- Our pilot studies had similar positive results that shaped our confidence in the benefits of e-prescribing technology;
- We share many populations of providers; and
- We selected and had a good working relationship with the same e-prescribing technology partner, PocketScript.

The joint initiative between THP and BCBSMA is one of the largest such initiatives in the United States and will offer nearly 3,500 physicians handheld e-prescribing devices with Pocket-Script software developed by ZixCorp.

The Program

The collaborative physicians and practices identified as high prescribers will be offered appropriate hardware at no cost, a year's license for the PocketScript software, and six months of connectivity (cellular data exchange or high speed internet access including installation). Based on our pilot experiences, we have expanded the technologies available through the program. They include a cell-phone-based option (using a Blackberry, and in the near future the Treo) as well as a WAN option using the Dell Axim 5 and an installed access point hooked to either DSL or cable high-speed internet access. Participants in the program are informed that this support is contingent upon their utilization of the technology

and member-specific formulary information at the point of care so the physician can chose the best therapeutic alternative for each particular patient. In addition to formulary information, the prescriber can request medication history and receive a list of all the prescriptions the patient has filled over the past three to six months.[1] This is invaluable in situations where the patient cannot remember exactly what medications they are taking and are under the treatment of several physicians. The application also provides a comprehensive drug reference tool and automatically checks for drug-drug interactions between previously prescribed medications and the medication being prescribed presently.

The e-Rx Collaborative is staffed by members of all three organizations, with an evolving structure that includes oversight, program management, and project teams. As we write this paper, the first handheld devices under the initiative are being deployed throughout the community.

We have found that prescriber education and training can be important to successful adoption of the technology. In January 2004, more than 70 prescribers attended the first e-Rx Forum where they received the handheld device of their choice (Dell™ Axim™ PDA or BlackBerry®) and training. The second e-Rx Forum in March 2004 offered prescribers the opportunity to earn CME credit at an e-prescribing seminar. The initiative has

tremendous momentum and generated excitement among our providers, which we intend to build upon.

Catalyst for New Technologies

The pilot programs convinced us that the expected benefits of e-prescribing could be realized in a very short period of time if we moved quickly to bring these benefits to a wider group with the e-Rx Collaborative. We now need to leverage e-prescribing and promote the adoption of additional technological tools.

Once providers and patients see the added value that e-prescribing brings to their relationship, we can transition into other

Care management – Online journaling for diabetics enables prescribers to monitor blood sugar levels and proactively make needed changes to medications. Step therapy can be assured or lab tests recommended.

Online doctor visits – Established patients can conveniently receive nonurgent care without an office visit. Intelligent software ensures that patients who should seek immediate medical attention are directed to do so.

Partnership with patients in cost containment – By providing copayment costs at the point-of-care, technology enables

---

 ... we can incrementally build a true electronic medical record, which, when integrated with a medical decision support system, will resolve many of the issues we currently face in the health care industry ...

---

areas with enhanced involvement. The technology exists today to bring quality of care to new levels. A few examples follow:

Wellness education – Providers have the ability to email patients customized educational material, enhancing its credibility and utility.

Speeding lab results – Patients are always anxious to receive lab results. Prescribers can annotate the results and transmit them electronically along with educational material.

Case manager involvement – When case workers can access appropriate patient prescription records, they can determine whether patients are getting their drugs and contact them if follow-up is needed.

prescribers to partner with patients in selecting the best treatment plan.

Going forward, as we incorporate different tools and capabilities, we can incrementally build a true electronic medical record, which, when integrated with a medical decision support system, will resolve many of the issues we currently face in the health care industry and begin to fulfill the promise that information technology holds for improving the quality and efficiency of medical care. ∎

Endnote

[1] *Massachusetts state law requires additional authorizations for the release of medications used only for the treatment of behavioral health disorders and sexually transmitted diseases. These drugs are not included in the medication history.*