Electronic Prescribing: Building, Deploying and Using E-prescribing to Save Lives and Save Money

Foreword by Newt Gingrich and Senator John Kerry

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Written by Representatives from the Following CHT Members:

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Contributors

Allscripts
Ann Fowler, Director of Marketing, ePrescribe
Jill Helm, Pharm.D., VP, Pharmacy Services
Jerry Krupa, Director, Product Management

American Hospital Association
Rod Piechowski, Senior Associate Director, Policy

American Medical Group Association
John K. Cuddeback, MD, PhD, Chief Medical Informatics Officer, Anceta
Karen Ferguson, Asst Director of Regulatory Affairs

Availity
Kimberly Shreve, Esq., Director, National Government Relations

Blue Cross Blue Shield Association
Justine Handelman, Director, Federal Policy
John Heekin, Legislative Writer

Covisint
David Miller, Chief Security Officer

Chrysler LLC
Charles Azu, Planning & Development, Prescription Drugs

HCA
Jonathan B. Perlin, MD, PhD, MSHA, FACP, FACMI, Chief Medical Officer and President, Clinical Services

Healthvision
CherylAnne Bell Harvey, Director, Product Management

InterComponentWare (ICW)
Kevin Green, SVP, Sales

MedImpact Healthcare Systems, Inc.
Richard Jay, Pharm.D., Chief Pharmacy Officer
Tim Rourke, VP, Medicare Programs

MedPlus, A Quest Diagnostics Company
Rohit Nayak, VP, Physician Connectivity Solutions

Microsoft
Susan Leonelli, MD, Director, Health Solutions Group

MinuteClinic
Jeff Peterson, Director of Public Affairs
Cris Ross, CIO

Misys
Robin Williams, Product Manager, Clinical Solutions

North Fulton Family Medicine
Jim Morrow, MD

Pharmaceutical Care Management Association
Missy Jenkins, SVP, Federal Affairs
Greg Johnson, Assistant VP, Federal and Regulatory Affairs

RxHub, LLC
Maria Friedman, Director of Federal Affairs
Tom Groom, SVP, Business Development
Chris Van Horrick, Director of Communications

Sanford Health
Daryl Bouma, IT Director & CTO
Dan Heinemann, MD, VP, Sanford Clinic
Dennis Hofer, Executive Director, IT

SureScripts
Kate Berry, SVP, Business Development & Executive Director, Center for Improving Medication Management

UnitedHealthcare
Dawn Bazarko, SVP, Clinical Innovation
Shannon Nelson, Director, Integrated Behavioral Health Line of Service

WellPoint, Inc.
Charles D. Kennedy, MD, Vice President of Health Information Technology & Research

Zix Corporation
Geoff Bibby, VP, Corporate Marketing
Kirk Paul Kirkman, VP, Physician Recruitment & Retention
Peter Wilensky, VP, Government Affairs

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Foreword

By Newt Gingrich and Senator John Kerry

In today's hyper-partisan political arena, it is rare to find an issue that offers such a compelling and vital opportunity for cooperation as does modernizing our healthcare system through information technology. Yes, it is important for policymakers and candidates to stand their ground when they must; but it is equally as important to have the courage to collaborate when they should.

In an age when technological innovation flourishes, and dependence on it is second nature, it is indefensible that healthcare remains in the dark ages. Thankfully there is unanimity that we must replace our archaic paper-based system, which kills too many and costs too much, with a robust, interconnected electronic system. Even in the midst of a divisive presidential campaign, Senators McCain and Obama are in full agreement on this issue.

Given this common goal, the question then becomes: how do we work together to achieve it? We believe that the best starting point is improving patient safety through electronic prescribing. Replacing handwritten prescriptions with automated, expert systems will undoubtedly save lives and save money.

Just look at the success of the Southeastern Michigan e-Prescribing Initiative (SEMI), a joint collaboration of Chrysler, Ford and General Motors as well as the Health Alliance Plan, Blue Cross Blue Shield of Michigan and Henry Ford Health System. SEMI has rolled out e-prescribing to nearly 3,000 physicians and has dramatically improved patient safety and lowered costs. Since 2005 more than one million prescriptions have been modified or cancelled due to adverse drug alerts. The initiative has already recouped startup costs, and SEMI estimates savings of more than $3 million each year.

Another example is the Massachusetts eRx Collaborative**.** Industry leaders from Blue Cross Blue Shield of Massachusetts, Tufts Health Plan and Neighborhood Health Plan have deployed e-prescribing tools to thousands of healthcare providers, covering hardware, software, set-up, training and ongoing support at no cost to the prescribers. The program has overwhelming support among physicians. More than 81 percent of prescribers would recommend e-prescribing to a colleague, and 71 percent of physicians said the technology saves them time.

It is these kinds of successes that led the Institute of Medicine (IOM), the preeminent authority on our healthcare system, to recommend that every prescription in the United States be written electronically by 2010. Government and industry leaders have not yet moved fast enough to meet this goal. The time is now to push this technology ahead.

One of the biggest obstacles to getting e-prescribing into the hands of physicians and providers is the current payment model in healthcare. A recent survey of physicians found that while the vast majority (80+ percent) know the value of e-prescribing, only

seven percent actually use the technology, and 63 percent said that implementing it was not a priority.[1] The main reason? It is not in their financial interest.

We can and must change this. And every payer in healthcare—from the federal government to corporate America—can lead. In healthcare we get what we pay for, so let's start paying for the right things. We should pay providers bonuses and higher reimbursements for those who use e-prescribing to improve care.

Private insurers like WellPoint and UnitedHealthcare are doing this in the commercial market. The Medicare Electronic Medication and Safety Protection (E-MEDS) Act would do this with providers in the Medicare program. The E-MEDS bill, which is currently being debated in the Congress, also includes a penalty for those physicians who, despite bonuses and higher reimbursements, still refuse to e-prescribe.

HHS Secretary Mike Leavitt noted that, "Large healthcare providers, including Medicare and Medicaid, need to move toward making [e-prescribing] a mandatory part of medical practice soon."[2]

We could not agree more. No more medication errors and no more paper inefficiencies.

We can transform health and healthcare, but it requires that we invest today in the technologies that will benefit our system—and more importantly our citizens—tomorrow. This is something on which all Democrats and Republicans can both agree *and* act.

Former House Speaker Newt Gingrich is founder of the Center for Health Transformation. John Kerry is a United States Senator representing Massachusetts.

[1] Ayres, McHenry & Associates on behalf of the Pharmaceutical Care Management Association, Survey of Physicians Regarding E-prescribing, July 2007.
[2] Secretary Mike Leavitt's Blog, http://secretarysblog.hhs.gov, November 16, 2007.

Introduction

"Prescription writing was not so much in vogue when I first went into business. A doctor would say [orally] how many pills to make, each to contain so many grains of this or that; or, so many ounces of syrup or mixture containing so many grains of such and such to a teaspoonful. We would pencil it on a scrap of wrapping paper and go to work… There was no refilling unless the doctor was present, and even he sometimes had to guess, as no copy was on file."

—Albert E. Magoffin (c. 1856)[3]

Over the past 150 years, the advancements in medicine, public health and the delivery of care have been nothing short of breathtaking. We routinely achieve feats that were virtually unthinkable even a generation ago. But one facet persists: paper. We have yet to find a way to move beyond paper record keeping. However, electronic prescribing (e-prescribing) is a technology whose time has come. It is the one technology where all of the key barriers to its adoption are being addressed and progress has been made:

- Experiences prove that e-prescribing saves lives and saves money;
- The technology is inexpensive, and there are many partnerships that offer no-cost solutions to physicians and providers;
- There is a secure, nationwide infrastructure to exchange data;
- Many technical standards have been finalized to achieve uniformity of data transmission; and
- Certification by industry leaders ensures security, privacy and interoperability with hundreds of vendors and products.

This is not to say that challenges do not remain. There are significant, yet achievable steps to the widespread acceptance and use of e-prescribing:

- Bridging the gulf between the technology and incentives to its adoption;
- Implementing technology that meets the needs of physicians and providers;
- Finalizing remaining data standards; and,
- Allowing controlled substances to be prescribed electronically.

In this paper we give policymakers and industry leaders a comprehensive look at the current state of electronic prescribing. And we present this report in a unique way: collaboratively. It was written by representatives from twenty-two organizations, all members of the Center for Health Transformation, from IT vendors and physician groups to hospitals, health plans, pharmacy benefit managers (PBMs) and employers. These organizations are leading the way to transform health and healthcare through information technology. It is our hope that this paper will explain the value of e-prescribing and outline what we can do collectively to ensure its rapid adoption.

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[3] Glen Sonnedecker, David Cowen, Gregory Higby, ed., *Drugstore Memories: American Pharmacists Recall Life Behind the Counter 1824-1933*, American Institute of the History of Pharmacy, 2002.

The Way Forward

What is Electronic Prescribing?

Electronic prescribing is the use of computing devices to create, modify, review, and/or transmit medication prescriptions from a healthcare provider to a pharmacy. By replacing handwritten prescriptions, e-prescribing saves lives by improving patient safety and saves money by eliminating the inefficiencies of manual processes. It achieves this through clinical decision support at the point of care and automating the transmission of data.

In 2006 the Institute of Medicine published a report on medication errors, revealing startling new statistics on the dangers patients face in our healthcare system.[4] Individuals average one medication error every day they stay in a hospital—1.5 million medication errors every year. This report followed the seminal IOM study on patient safety, which concluded that up to 98,000 Americans are killed every year by preventable medical errors.[5] More than 7,000 Americans are killed every year from preventable medication errors. Sadly these figures are most likely very conservative estimates.

In the report on medication safety, the IOM outlined a series of bold—and obvious—solutions that would improve the drug delivery, dispensing and prescribing processes, from consumer medication management and coordination among federal agencies to payment reform and drug monitoring. One of the most important recommendations was the call for all healthcare organizations to immediately deploy technological tools to automate the prescribing process. With access to comprehensive medication information, interoperable and easy-to-use technology and updated patient-specific information, the IOM concluded that providers could dramatically improve patient safety and avoid unnecessary and preventable errors. In fact, the IOM so believed in the power of technology that it called for every prescription to be written electronically by 2010.

Real-time clinical decision support for patient safety is a key feature of electronic prescribing systems. Electronic systems can check each prescription as it is written, either for internal inconsistencies such as excessive dosage or for conflicts with the patient's known allergies, interactions with other active medications, duplicate therapy and many other conditions.[6] Prescriptions written electronically eliminate medication errors due to illegible handwriting. Additionally, basic features such as standardized drug databases and pre-configured prescription directions provide consistency and added assurance for complete prescription orders. In contrast to the traditional retrospective drug utilization review, decision support within electronic prescribing applications alerts prescribers *during* the decision making process. This eliminates the need for re-work while taking into account other clinical information such as laboratory values or data from an electronic health record (EHR). The resulting value of this robust patient safety capability

[4] Institute of Medicine, 2006
[5] Institute of Medicine, *To Err Is Human*, 2000.
[6] eHealth Initiative. *Electronic Prescribing: Toward Maximum Value and Rapid Adoption*, 2004.

has led some malpractice insurers to provide discounted insurance rates to providers who prescribe electronically.

On the administrative side, presenting accurate and concise formulary and benefit information at the point of care enables the prescriber to know which drugs are considered to be "on formulary" or have the highest formulary coverage status (most preferred), as well as alternative medications for those drugs not on formulary. They can also be aware of unique circumstances that may impact or otherwise limit the plan coverage for a given medication, such as prior authorization requirements, quantity limits, gender limits, age restrictions, step therapy rules, etc.

Having this information available to prescribers at the point of care during the medication selection and treatment decision making process can improve formulary compliance and generic substitution which helps to control prescription drug costs. Retrospective reporting enables medical groups to proactively review and compare individual prescribers and identify patterns to optimize formulary compliance.

Secure, Nationwide Infrastructure

Electronic prescribing systems are securely connected in real-time to two major infrastructures, RxHub and SureScripts. The RxHub network is a secure link for more than 60 key technology partners and the nation's leading pharmacy benefit managers, health insurance plans, Medicare Part D and Medicaid plan services. When a patient visit is scheduled or a prescription is written, prescribers can retrieve patient eligibility, medication history and drug formulary information through RxHub's secure Master Person Index, which includes information on more than 200 million commercial lives in the United States.[7]

Through the SureScripts network, certified e-prescribing systems are bi-directionally connected to SureScripts' Pharmacy Health Information Exchange (PHIE), covering more than 95 percent of the nation's pharmacies. Complementing the patient medication history data available obtained from health plans and PBMs, SureScripts delivers patient medication history from pharmacies to physicians by securely connecting to and aggregating a patient's medication history data stored in the databases of community pharmacies. That data is presented to physicians enabling them to view the instructions that may accompany their patient's prescriptions. Physicians may also be able to view data related to allergies and medication dispensing dates if it is provided by participating pharmacies. This pharmacy-based medication history includes prescriptions that come to the pharmacy via phone, fax and electronically, as well as those that come in as handwritten prescriptions. The data from pharmacy also includes all cash prescriptions including the increasingly popular four-dollar generic prescriptions, which in many instances are filled as cash prescriptions even if the patient has third-party coverage.

[7] RxHub, *Blueprint for E-Prescribing: A Detailed Plan of Action for Implementing E-Prescribing*, May 2008. Excerpts throughout this paper are used with permission.

The end result combines pharmacy data with medication data from existing sources to provide physicians with a more complete, timely and clinically sound view of a patient's prescription history. This patient-level information is downloaded in a matter of seconds to the provider's certified e-prescribing application. With this information the risks of preventable medication errors are dramatically reduced.

When combined with other diagnosis and treatment information, the physician can accurately prescribe the most appropriate and affordable medication at the point of care helping to ensure that the correct medication is dispensed for the right patient at the right time. It is often the difference between a medicine improving one's quality of life and a medication error that jeopardizes it.

Advantages of Electronic Prescribing

Electronic prescribing replaces pen and paper with automated, cutting-edge technology. Clinical decision-support tools improve patient safety by alerting prescribers to drug allergies and harmful drug interactions. And e-prescribing not only improves the process of medication dispensing, having formulary information from a patient's insurer at the point of care allows prescribers to reduce costs by choosing the most cost-effective treatment. To put it simply, e-prescribing improves quality and reduces costs simultaneously.

Getting Connected with E-prescribing: Stand-alone Systems and Electronic Health Records

Errors and inefficiencies often mar the care-delivery process, particularly when physicians and other prescribers lack decision-support tools found in e-prescribing software and EHRs. There are many reasons why physicians have not adopted these kinds of technologies, which will be addressed later in this paper. But for the 35,000 providers that have overcome these barriers and are using e-prescribing today, which is estimated to grow to 85,000 physicians this year, they use the technology as part of an electronic health record or as a stand-alone system.[8]

Deciding which approach to use is one of the many decisions that physicians and providers will make as they assess and implement e-prescribing. A valuable resource for providers is the Electronic Prescribing Readiness Assessment, a new initiative led by the American Academy of Family Physicians, the Medical Group Management Association, other medical and professional societies as well as the Center for Improving Medication Management. Located at www.getrxconnected.com, the tool offers a customized guide to assist providers in selecting e-prescribing technology, be it a stand-alone system or integrated with an EHR. There are benefits to both approaches

Stand-alone e-prescribing systems can be a wise choice for small physician groups or solo practitioners. Small groups and single physicians, who comprise the majority of

[8] SureScripts, *National Progress Report on E-prescribing*, December 2007.

practices today, usually do not have IT support staffs or large capital budgets for infrastructure improvements or investments. Therefore, the relatively inexpensive stand-alone e-prescribing tool can offer an easier step in adopting health information technology.

Independent e-prescribing systems offer the same robust array of decision-support tools as a fully integrated EHR tool, such as clear, legible prescriptions, alerts of potential drug-to-drug or allergic reactions and guidance on the availability of generic alternatives and formulary compliance. Many stand-alone offerings can be optimized to include the availability of additional clinical information, lab values and targeted messaging for chronic care management.[9] The technology can also be integrated with practice management systems. And when connected to secure, certified networks like RxHub and SureScripts to deliver insurance eligibility, formulary and medication history, almost no information is required to be extracted and converted from patients' paper files, significantly speeding the process and reducing the cost of implementing a stand-alone system.

Stand-alone e-prescribing systems can be a powerful gateway for providers to adopt even more sophisticated technology down the road. Once the electronic infrastructure is implemented, a platform is in place to add functionality, migrating the practice toward a fully integrated system. Data from the stand-alone tool can be transferred to an integrated system, or if the e-prescribing tool is interoperable, it may provide a springboard for adopting the broader functionality of a complete EHR.

Implementing a fully integrated EHR with e-prescribing is a much bigger undertaking, but one that provides greater benefits. Full medication data is available throughout the record, so it can be used not just when prescribing medications, but across the spectrum of care delivery. Medication data can be coupled with laboratory results, images and other diagnostics to present a complete picture of the patient. Beyond just medication management, an EHR can transform the delivery of care in any setting.[*]

Dr. James Morrow, vice president of the thirteen-physician North Fulton Family Medicine practice outside of Atlanta, Georgia, credits their EHR with saving his group $1 million in the first 18 months of operation—*after* accounting for the cost of implementation. The EHR has given the four-office practice instant access to patient records; eliminated the need for staff to locate, deliver and re-file paper records; saved time through notes that are created during the visit, rather than afterward; allowed for significant reductions in paperwork; and eliminated virtually all transcription costs. The recouped transcription costs alone saved approximately $775,000 in the first 18 months.

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[9] Eric Poon, Ashish K Jha, et al., "Assessing the Level of Healthcare Information Technology Adoption in the Untied States: A Snapshot," BMC Medical Informatics and Decision Making, 5 Jan. 2006. Accessed June 2, 2008: www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1343543

[*] For an excellent perspective from a small physician group that implemented an electronic health record, please see Dr. Richard Baron's article from the *Annals of Internal Medicine*, August 2005.

The electronic health record also has freed up office space previously used for chart storage and sharply decreased the amount of time staff spend on administrative functions. In the first year of implementation alone, the practice eliminated more than $253,000 in labor costs associated with chart pulls, new patient chart generation, missing chart searches, transcription, lab result handling and the coordination of referral letters. In total, the leadership of North Fulton concluded that the EHR saved them—not the insurance companies—$33 per patient visit.[10]

Dr. Morrow and his colleagues recently added electronic prescribing to their EHR. (E-prescribing was illegel in Georgia until September 2006.) Dr. Morrow described their experience for this paper: "The money saved by adopting an electronic system for filling electronic refill requests alone is tremendous. Our practice is on track to save over $40,000 in this calendar year solely by answering pharmacies' electronic refill requests. This savings comes from time saved by nursing staff not having to be on the phone with pharmacies and patients to provide these refills. Any practice should be getting in line to save this kind of money in the financial environment we all practice in today."

This is not to say that all physicians and providers who use e-prescribing found their system perfect. According to an article in *Health Affairs*, there are technical improvements for both EHRs and stand-alone devices that should be made, such as ensuring reliable access to a comprehensive list of patients' medications outside of a single practice and obtaining accurate patient-specific formulary information for all insurers.[11] As the technology advances, standards are finalized and more stakeholders work collaboratively, these technical issues can and must be resolved.

Privacy and Security

Protecting the security and confidentiality of personal health information is of extreme importance. E-prescribing is no different. E-prescribing transactions and access to patient information are only available when requested by an authorized provider through their certified application. There is no national database containing everyone's personal health information. All e-prescribing systems use role-based access, meaning that only those who are authorized to see sensitive patient information can access it. Firewalls and encryption add even higher levels of protection. Additionally, the use of this technology to access personal health information must comply with all aspects of the Transaction, Privacy and Security requirements of the Health Insurance Portability and Accountability Act (HIPAA), as well as any state laws that exceed these federal regulations. These include strict requirements for accessing and disclosing protected health information, for obtaining patient authorization for certain uses and for maintaining audit trails and non-repudiation.

[10] This case study was profiled in the CHT Press book, *Paper Kills*, in the chapter authored by Allscripts' CEO, Glen Tullman.
[11] Joy Grossman, Anneliese Gerland, et al., "Physicians' Experiences Using Commercial e-Prescribing Systems," *Health Affairs* 26, no. 3 (2007): w393-w404.

While security breaches have made headlines in the press when sensitive medical information has been compromised, every one of these incidents was due to human error—not as a result of technical malfunctions or hacking. To date neither RxHub nor SureScripts has had a security breach that has compromised the confidentiality of any personal data.

Medication Compliance

It is estimated that approximately 20 percent of prescriptions go unfilled by patients every year.[12] This non-compliance is dangerous to the health of these patients. Not following a provider's instructions to take a prescribed medication increases the likelihood of hospitalization, developing complications, disease progression and premature disability.[13] It is also a waste of time and resources for providers, pharmacies and health plans. One study concludes that non-compliance with prescription medications costs at least $75 billion each year.[14]

The electronic transmission of a prescription to a pharmacy increases the likelihood that it will be picked up by the patient. It eliminates the patient's responsibility of delivering the prescription to the pharmacy, a problem cited by more than one-third of patients who either forgot to drop it off or had difficulty doing so.[15]

Electronic renewal requests, such as the fill status notifications standard included in the final rule issued by the Centers for Medicare and Medicaid Services (CMS) in April 2008, establish a path for pharmacies to share information back to the prescriber in real time on whether a patient picked up a prescription, thereby reducing the time for identification of non-compliance. This creates an opportunity for the patient and prescriber to discuss the reasons for noncompliance, hopefully resolving the reasons for it and then improving the quality and safety of care.

Patients also cite the cost of a medication as a reason for non-compliance. E-prescribing systems that present formulary information can assist prescribers in selecting the optimal therapy for the patient both in terms of treatment and efficacy but also by the cost the patient can bear.

Currently there is hope that a patient's personal health record (PHR) will help improve medication compliance. The most valuable consumer portal is one that is populated with

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[12] Boston Consulting Group, *The Hidden Epidemic: Finding a Cure for Unfilled Prescriptions and Missed Doses*, December 2003.

[13] Dunbar-Jacob J, Mortimer-Stephens MK. "Treatment adherence in chronic disease," *Journal of Clinical Epidemiology* 54 (suppl 1): s57–s60, (2001). Ellis S, Shumaker S, Sieber W, Rand C. "Adherence to pharmacological interventions: Current trends and future directions," *Controlled Clinical Trials* : 21(Suppl): 218–225, (2000) Jackevicius CA, Mamdani M, Tu JV. "Adherence with statin therapy in elderly patients with and without acute coronary syndromes," Journal of the American Medical Association 288: 462–467, (2002).

[14] "Reminders Not Effective for Medication Compliance, Study Says." Research report from the Ohio State University. Accessed at http://researchnews.osu.edu/archive/nocomply.htm May 29, 2008.

[15] Boston Consulting Group, 2003.

clinically relevant information derived from certified e-prescribing tools and integrated with solutions such as Google Health, Microsoft HealthVault and health plan, hospital or medical group PHRs. With an accurate PHR that is pre-populated with clinically relevant data, patients can take their medical records with them and will have access to their data anytime and anywhere.

Sadly, where this integrated approach could be most useful—in Medicare where the average senior citizen takes multiple medications a day—federal law stands in the way. CMS is conducting a pilot in South Carolina to test the value of Medicare beneficiaries using PHRs, but one critical piece of data that is missing is medication information. Even though CMS has this data available and could pre-populate these PHRs with it, they will not. CMS interprets certain provisions of the Medicare Modernization Act as prohibiting the sharing of Part D data in their own pilot. To their credit, they are working with the organizations running the pilot to try to resolve this issue, but it is yet another example of how poorly designed laws can often impede progress.

Efficiency Gains

While there is a perception that putting pen to paper is always faster when writing a prescription, this perceived time savings often creates other more costly inefficiencies down the road. Of the more than three billion prescriptions written each year, doctors report that nearly one billion of them require a follow-up between providers and pharmacies for clarification.[16] A study by the Medical Group Management Association's Group Practice Research Network reports that the average practice fields up to 50 calls per day from pharmacies.[17] The report also estimates that administrative complexity related to prescriptions costs the average ten-physician practice more than $157,000 a year—approximately $15,700 per physician per year. That translates into nearly $9 billion in system-wide inefficiencies that e-prescribing could possibly eliminate. This estimate is just from the physician side. Efficient, electronic communication will improve efficiencies for pharmacies as well.

The clinical decision support features in e-prescribing systems also generate efficiency gains. Rather than having to look up drug interactions and contra-indications in medical reference sources, up-to-date databases and rules engines will immediately alert a prescriber to a potential problem and automatically assess whether the prescription is appropriate for the patient.

The American Medical Group Association (AMGA), which represents multi-specialty medical groups and other organized systems of care, surveyed its member medical groups in May 2008 about their experiences with e-prescribing. The vast majority of AMGA's members have been early adopters of EHRs, and many have also adopted e-prescribing.

[16] John Kerry and Newt Gingrich, "E-Prescriptions," *The Wall Street Journal*, November 16, 2007.
[17] Medical Group Management Association, "The cost of administrative complexity," *MGMA Connexion*, November/December 2004.

In preliminary results from 49 medical groups (with an average size of approximately 275 physicians) in which e-prescribing is either fully adopted (37 groups) or partially adopted (12 groups), all of the following benefits were rated 3.3 or higher on a 1–5 scale:

- Discovered potentially significant drug-drug, drug-allergy or drug-lab interactions;
- Reduced adverse drug events (ADE),
- Reduced avoidable emergency department visits or hospital admissions;
- Eliminated transcription or legibility errors;
- Availability of a more complete, up-to-date medication list for each patient;
- Increased practice efficiency;
- Increased prescriber efficiency (e.g., fewer call-backs from pharmacies);
- More effective medication reconciliation across multiple settings of care; and
- Increased patient satisfaction.

In contrast to the high ratings for benefits, no item on a list of barriers and challenges was rated higher than 3.1, on the same 1–5 scale. The highest-rated items were challenges in creating efficient workflows and challenges in creating a complete, accurate patient medication history. These preliminary qualitative results suggest that these medical groups have, indeed, seen the anticipated patient-safety benefits, in addition to a net increase in efficiency for the practice and for prescribers.

These systems can also help reduce the complexity of quality reporting and conforming to standards. Aggregated data on prescribing patterns, compliance and drug effectiveness—not personal health information—can be used for a multitude of purposes, from quality and safety reporting to improving drugs and delivery methods. Additionally, each state board of pharmacy may have their own set of e-prescribing standards, and these can be handled centrally through e-prescribing gateways instead of managed within each computer system.

Savings

In July 2007, the Pharmaceutical Care Management Association (PCMA) commissioned the Gorman Health Group to estimate the cost savings and patient safety associated with government policies that would increase the use of electronic prescribing. Based on a comprehensive literature review and structured interviews with more than two dozen national experts, the Gorman study outlined policy options that move the health system toward the IOM's recommendation of universal e-prescribing by 2010.

According to the study, e-prescribing could prevent nearly two million medication errors, saving countless lives.[18] Much of this is attributed to the decision-support aspects of the technology, such as immediate access to patient medication histories and safety alerts. The federal government could save up to $26 billion over the next decade just in the Medicare program—even after providing funds for equipment, training and support—as

[18] Gorman Health Group on behalf of the Pharmaceutical Care Management Association, *Options to Increase E-Prescribing in Medicare*, July 2007.

long as physicians are first incentivized and then required to use the technology as a condition for participating in the Medicare program. The study concluded that this approach of combining a requirement with financial incentives would result in approximately 80 percent of physicians adopting e-prescribing technology.

In December 2007, Senators John Kerry (D-MA) and John Ensign (R-NV) and Representatives Allyson Schwartz (D-PA) and Jon Porter (R-NV) introduced the bipartisan Medicare Electronic Medication and Safety Protection (E-MEDS) Act, which would utilize the combined requirement-incentives approach to maximize physician adoption of e-prescribing in Medicare.

CMS has also weighed in on potential savings from electronic prescribing. As noted above, CMS issued a final rule in April 2008 establishing Part D e-prescribing standards for four types of information: formulary and benefits; medication history; fill status notification; and identification of individual healthcare providers. Based on conservative estimates of utilization and drug costs for Part D beneficiaries, CMS estimates that e-prescribing would save Medicare patients, physicians and dispensers nearly $1 billion over five years due to increased generic substitution, avoiding adverse drug events, lower out-of-pocket expenses and administrative savings.[19]

Other studies that show the financial impact of electronic prescribing include an actuarial analysis by Milliman.[20] Milliman concluded that when decision-support information is presented to a physician at the point of prescribing, a payer's drug expense could be reduced by as much as 15 percent and that drug-cost inflation could be reduced by one percent each year.

Cap Gemini conducted a study to determine the potential financial impact of e-prescribing by physicians on managed care pharmacy risk pools.[21] This large-scale analysis included more than 680,000 electronic prescribing records from more than 1,200 physicians using Allscripts' technology. The analysis showed that e-prescribing can save insurers anywhere from $0.75 to $3.20 per prescription, depending on the plan and medication. Additionally, generic fill rates increased from 43 percent to 55.5 percent.

A team led by Dr. Michael Fischer of Harvard Medical School and Brigham & Women's Hospital conducted an 18-month study to assess whether e-prescribing with full decision support increased the prescribing generic medications, and, if so, what the potential impact on medication costs would be.[22] This study involved 15,426 physicians writing

[19] CMS. (2008, April 7). Medicare Program: Standards for E-Prescribing Under Medicare Part D and Identification of Backward Compatible Version of Adopted Standards for E-Prescribing and the Medicare Prescription Drug Program (Version 8.1). Final Rule. Federal Register, Vol. 73, No. 67, pp. 18939-18940.
[20] Potential Impact of Electronic Prescribing on Medicare Prescription Drug Spend. Prepared for RxHub by Milliman (2006).
[21] Cap Gemini Ernst & Young, "Touchscript Medication Management System, Financial Impact Analysis on Pharmacy Risk Pools," October, 2000.
[22] Fischer MS, Ferris TG, Vogeli C, Stedman M, Brookhart MA, Weissman, JS. "Impact of electronic prescribing on medication use and cost in community-based practices." Oral Presentation, SGIM, Toronto, April 2007.

12.8 million prescriptions for more than one million patients in Massachusetts. Dr. Fischer and his team found that physicians using the PocketScript e-prescribing application from Zix Corporation were 3.4 percent more likely to prescribe a generic medication than non-e-prescribing physicians, in a state that already had the highest baseline generic usage in the country due to its mandatory generic substitution. This impact translated into a savings of $3.34 per prescription per patient-month, or on average $4.01 million per 100,000 insured patients each year.

Fraud and Abuse

The adoption of e-prescribing can significantly reduce prescription drug fraud and abuse. Electronic systems give providers, pharmacies, payers and government agencies the ability to see events in near real-time that may be virtually undetectable with paper prescriptions. Audit trails show exactly which physician or provider prescribed a medication and when, and expert systems can detect unusual prescribing patterns. Pharmacies have the ability to prevent patients from filling a prescription at multiple locations. Fraud and abuse detection is currently done retrospectively and often months after a crime or error occurred. E-prescribing can accelerate their analysis and prevent fraud and abuse from happening in first place. This topic will be addressed in more detail below in the section on the Drug Enforcement Agency and e-prescribing controlled substances.

Examples of Excellence

By the end of this year, SureScripts estimates that more than 85,000 providers will be using e-prescribing technology. Many will have decided on their own to move forward. Others will have partnered with a health plan or an employer. Others will have participated in a state-sponsored initiative. Regardless of their reason, there are many success stories that document the progress being made to modernize healthcare through electronic prescribing, from real clinical improvements to conclusive efficiency gains to documented savings. The following case studies serve as a small sample of what is happening in communities across the country where leaders from part of healthcare are coming together to implement technology that saves lives and saves money.

Private Market Initiatives

Massachusetts eRx Collaborative

The Massachusetts eRx Collaborative was established in October 2003 as an outgrowth of existing e-prescribing pilot programs at Blue Cross Blue Shield of Massachusetts and Tufts Health Plan, joined later by the Neighborhood Health Plan. Partnering with ZixCorp as the technology provider and later adding DrFirst, the Collaborative has sponsored the deployment of e-prescribing tools to thousands of healthcare providers, offering a turn-key approach to implementing hardware, set-up, training and ongoing support at no cost to the prescribers.

Through use of the e-prescribing tools, physicians are able to access patient-specific prescription drug and medical histories; be alerted of drug-to-drug and drug-allergy interactions; electronically transmit prescriptions directly to a pharmacy, minimizing possible errors from illegible handwriting; view formulary compliance information; and, access drug reference guide to review generic alternatives for brand-name prescriptions.

Massachusetts received the *SureScripts Safe-Rx Award* for the past two years for transmitting the most electronic prescriptions in the country, and the Collaborative was recognized as a major contributor to this achievement. Other achievements include:

- Nearly five million prescriptions transmitted electronically in 2007, and more than 13.5 million since the Collaborative's inception;
- In 2007, approximately 104,000 electronic prescriptions were changed or cancelled because of drug-safety alerts to the physician;
- In 2006, BCBSMA e-prescribers saved five percent on their drug costs compared to prescribers that did not use the technology. Of that savings, BCBSMA members saved $800,000 in co-payments for their prescriptions resulting from improved formulary compliance and increased use of generic alternatives.

The eRx Collaborative has also been well-received in the provider community. More than 81 percent of prescribers reported that they would recommend e-prescribing to a colleague, and 71 percent said the technology saves time—up to one to two hours per day—as a result of its use.

In 2005, the Massachusetts eRx Forum was established by insurers, technology vendors, pharmacies and other organizations to raise awareness of e-prescribing and increase its adoption statewide. The Forum has partnered with the Massachusetts Medical Society to develop a Continuing Medical Education course called "Electronic Prescribing Education: How to Improve Medication Safety and Reduce Drug Costs Through e-Prescribing," in order to inform practicing physicians of the value of health information technology.

Southeastern Michigan e-Prescribing Initiative

The Southeastern Michigan e-Prescribing Initiative (SEMI) was founded in 2005 to promote the adoption of e-prescribing standards and practices across southeast Michigan's healthcare provider community. SEMI is a collaborative partnership between Chrysler LLC, Ford Motor Company, General Motors, the United Auto Workers, Blue Cross Blue Shield of Michigan, the Health Alliance Plan and the Henry Ford Medical Group. Supported by leading pharmacy benefit companies CVS/Caremark and Medco Health Solutions and data connectivity from RxHub and SureScripts, SEMI sought to reduce medication errors, improve the quality of care and decrease prescription drug costs with greater generic prescription utilization and formulary compliance.

To facilitate the adoption of e-prescribing technologies, SEMI helps to subsidize the cost of implementation for physician groups and incentivizes its use. To date the program has boasted impressive results in e-prescribing adoption and use, including: nearly 3,000

physicians enrolled; more than 350,000 prescriptions transmitted each month; and more than 25,000 prescription alterations each month resulting from potential adverse drug event warnings, such as drug-to-drug interactions and patient allergies.

Improved formulary compliance and generic prescription alternative alerts have helped to reduce costs for patients, while potential adverse drug event warnings have improved the overall quality of care delivered and prevented unnecessary expenses resulting from adverse reactions. The results of a recent comprehensive survey of e-prescribing providers demonstrated the widespread approval and acceptance of this innovative health technology, with nearly 75 percent of physicians responding that they strongly believed it improved safety for their patients, and close to 70 percent reporting that it improved the quality of care.

National ePrescribing Patient Safety Initiative

The National ePrescribing Patient Safety Initiative™ (NEPSI™) is a coalition of the nation's most prominent technology companies and healthcare organizations dedicated to improving patient safety and reducing harmful medication errors by offering free electronic prescribing for every physician in America. The NEPSI offering, Allscripts ePrescribe℠ (formerly known as eRx NOW), is web-based software powered by the same engine that is used today by more than 45,000 physicians to write millions of electronic prescriptions each year. Allscripts ePrescribe℠ is available free to any healthcare provider with legal authority to prescribe medications, and requires no download, no special hardware and minimal training. Since its inception in January 2007, thousands of physicians have registered for the program and are delivering safer patient care while saving both time and money. Many states and regions have joined with community-wide deployments of e-prescribing.

MinuteClinic

MinuteClinic is the pioneer and largest provider of retail-based health care in the United States. Operating as a subsidiary of CVS/Caremark Corporation, MinuteClinic operates 518 health care centers in 25 states. The clinic's services are designed to complement rather than replace primary care providers, and patient assessments and treatment follow nationally established clinical practice guidelines from the Institute for Clinical Systems Improvement, American Academy of Family Physicians (AAFP) and the American Academy of Pediatrics. These guidelines are embedded in MinuteClinic's electronic medical records system (EMR). Nurse practitioners use a software program that generates educational material, an invoice and a prescription (when clinically appropriate) for the patient at the conclusion of each visit, as well as a diagnostic record that is automatically mailed to the office of the patient's primary care provider. In an effort to further automate the sharing of clinical information between providers, MinuteClinic, AAFP and SureScripts are conducting a pilot that will allow the nurse practitioner to electronically send this patient summary directly to the primary care provider's EMR (no printing, mail or faxing required).

MinuteClinic began implementing e-prescribing in June 2007. To date more than 91 percent of its 518 clinics are using the technology, with plans to wire the remaining

clinics. In line with MinuteClinic's policy of generic medication promotion as a cost-saving measure for patients, the EMR allows nurse practitioners to search for prescriptions by the brand name and provides the resulting correlative generic alternatives. The software then checks for drug-drug and drug-allergy warnings to ensure the greatest level of safety and the most effective options for patients. Because the MinuteClinic e-prescribing application has been certified by SureScripts, the nurse practitioner is then able to transmit the e-prescription to a pharmacy of the patient's choice using the SureScripts Pharmacy Health Information Exchange.

Southwest Medical Associates

The largest medical group in Nevada, Southwest Medical Associates (SMA), a subsidiary of Sierra Health Services, deployed Allscripts' electronic health record, TouchWorks, to its nearly 250 medical providers, and is providing electronic prescribing to all physicians in Nevada for free. After three years of using electronic prescribing, SMA's generic fill rate had achieved a 4.8% lead over a controlled group of physicians in other SHS network groups that do not use e-prescribing. Because every one point increase in use of generics equals a cost savings to the organization of 1.5%, SMA's increased generic utilization saves $4.75 million each year, or 7.2% of its 2005 drug spending of $66 million.

TouchWorks, which is a full electronic health record, also greatly streamlines the process of approving prescription refills, in the process creating indirect financial savings to SMA of $208,640 a year through increased nurse productivity. Taken together, the EHR's annual financial savings of $4.96 million has netted SMA a reduction in average costs of $5.17 per prescription. SMA's solution also has increased formulary compliance for the group's physicians and enhanced patient safety. Thanks largely to its e-prescribing initiative, SMA now has a generic utilization rate of 73.2%, one of the highest rates in the country.

Blue Cross Blue Shield E-prescribing Programs

Anthem Blue Cross Blue Shield of Ohio

In line with Anthem Blue Cross Blue Shield's commitment to provide technology solutions that advance quality healthcare and improve efficiencies within the medical system, the *Ohio e-Prescribing Program* was initiated in 2006 with General Motors, Quest Diagnostics/MedPlus and WellPoint. The program was designed to promote the use of electronic prescribing within a targeted group of physicians in the Middletown, Ohio area.

The initiative provided access to MedPlus' Care360 Physician Portal, which enables providers to electronically manage their prescribing and laboratory transactions in a single integrated application. Physicians were also provided with free computers and upgraded systems in order to access the electronic service and maintain their patients' health records.

The program successfully recruited more than 100 physicians from a pool of 400. Through assessments of office workflow and subsequent process recommendations, as well as the integration of customized on-site training and regular account troubleshooting assistance, WellPoint and MedPlus were able to get early buy-in and adoption. Since the program's implementation, physician participation and utilization of e-prescribing continues to follow an upward trend, particularly in terms of prescriptions transmitted per provider per month and generic utilization rates, which have risen two percent across the participant pool. Now in its second year, the initiative is preparing for further expansion within the state.

WellPoint New Hampshire
Recognizing the broad potential of statewide health IT, Anthem Blue Cross and Blue Shield joined the New Hampshire Citizens' Health Initiative in August 2007 to introduce an innovative e-prescribing program. Through collaboration with the National e-Prescribing Patient Safety Initiative and Sprint, Anthem created a "turn-key" program to facilitate the adoption of e-prescribing by New Hampshire physicians on any device with an Internet connection at no additional cost. Though introduced by Anthem, the program also applies to patients covered by other payers. The application offers physicians real-time electronic messages regarding patients' insurance eligibility, formularies and medication histories, as well as alerts of potential adverse drug events resulting from allergies or prescription drug interactions.

The partnership with Sprint further improves the program by offering point-of-service access to patient information with an e-prescribing-capable mobile smart phone, free to physicians who enroll in a discounted cell phone/ data plan. Anthem worked through the NEPSI e-prescribing software provider Allscripts to add three product features unique to Anthem members, designed to reduce the burden of implementing the system and improve the quality of care delivered to patients:

1. Using Anthem's claims databases, providers may opt to have Allscripts load member information into the e-prescribing system in order to reduce the administrative burden on physicians' offices.
2. Anthem's Member Medical History, a claims-based record of a patient's care history, is integrated into the e-prescribing software, thereby allowing providers access to information across the health care spectrum. This tool improves the coordination of care for a single patient across multiple providers, reducing repetitive, redundant and unnecessary tests and procedures.
3. The e-prescribing software offers real-time access to an individual patient's status on quality measures used in the New Hampshire Pay for Performance program called *Anthem Quality Insights (AQI*). These status updates allow the physician to efficiently perform wellness screenings while the patient is in the office, reducing the number of visits a member must make to the provider.

Anthem further promotes the implementation of the e-prescribing initiative through its *AQI* Primary Care, Ob/Gyn and Cardiology Quality Incentive Programs, which reward providers for surpassing measures in clinical quality, patient safety, pharmacy

improvement and technology adoption. The tools offered by the e-prescribing program aim to directly improve the quality markers recorded in *AQI* for participating providers and complement Anthem's efforts to transform health care quality and efficiency. To date, approximately 100 primary care physicians have joined the e-prescribing program across the state. Anthem's program goal is to enroll 300 primary care physicians, representing approximately 10 percent of the state's provider population.

Blue Cross and Blue Shield of North Carolina
In 2006, Blue Cross Blue Shield of North Carolina launched an e-prescribing program to identify more than 1,000 high-volume prescribing physicians to receive a handheld personal digital assistant (PDA), software licenses and wireless network hardware free of charge. Using claims data BCBSNC uploaded the physicians' patient information into the system, delivering point-of-service member formulary benefits, generic alternatives to prescription drugs and immediate alerts of potential adverse drug events.

More than 1,000 physicians have enrolled in the initiative and more than four million electronic prescriptions have been sent. Of those prescriptions, 59 percent received drug-to-drug interaction warnings; 32 percent of the orders were flagged as formulary warnings; and two percent were halted due to alerts of patient allergies and changed accordingly.

CareFirst Blue Cross and Blue Shield
CareFirst Blue Cross Blue Shield, serving the Mid-Atlantic region, launched an e-prescribing program to help subsidize the cost of servicing 500 physicians with handheld PDAs equipped with the *Rcopia* software developed by DrFirst. CareFirst loaded the e-prescribing hardware with member data, providing physicians with real-time access to patient medical histories, formulary coverage and warnings of potential drug interactions and allergies.

In the e-prescribing program's pilot year, more than 345,000 prescription transactions were placed. Participating providers showed a four percent increase in member formulary compliance, while more than 2,800 prescriptions were flagged for potential drug interactions or allergies and were subsequently changed. The reduced rate of adverse drug events and associated treatment produced an estimated savings of $624,000 in the program's pilot year.

In 2007, more than 525,000 prescriptions were written electronically. In addition, nearly 23,000 medication history requests were made, allowing the physician to review all of the patient's medications. Reviews of the complete medication history resulted in prescription changes due to allergy warnings (9 percent), drug-drug interaction warnings (34 percent), duplicate therapy warnings (36 percent), dose warnings (13 v) and formulary non-compliance warnings (22 percent).

Horizon Blue Cross Blue Shield of New Jersey
The e-prescribing initiative launched by Horizon Blue Cross Blue Shield is designed to provide safe and effective pharmaceutical care through improved connectivity between

physicians, health plans, pharmacists and patients. Since the program's inception in 2003, more than 1,500 prescribers have used the technology, and more than three million electronic prescriptions have been written. In 2007, Horizon became a regional supporter for the National ePrescribing Patient Safety Initiative. Horizon also supports multi-payor solutions and has collaborated with research partners on CMS-sponsored studies to test standards that will ensure system-wide interoperability and further the adoption of this important tool to improve patient safety.

As a byproduct of electronic prescribing use, Horizon discovered through data analysis that an alarming proportion of prescriptions are going unfilled. In their study, 65% of newly diagnosed patients with coronary artery disease never picked up their initial script. Similar trends were identified in other drug classes. Horizon is currently engaged in follow up studies to explore factors that drive noncompliance and develop engagement strategies with patients and doctors based on the findings.

Blue Cross Blue Shield of Louisiana
In the summer of 2006, Blue Cross Blue Shield of Louisiana launched an e-prescribing program for 500 physicians. The program, the first of its kind in the state, was established to facilitate technology adoption, study the challenges and benefits and to potentially explore the sponsorship model to electronic medical record. E-prescribing is a critical part of the company's health information technology strategy to enable and expand provider adoption of patient-centric EHRs around the state. More than half of the providers re-enrolled in the program after the first year, and utilization has been quite good (on average, 60 prescriptions per month). Tulane University is conducting a study of the pilot and will publish results of the program to encourage state-wide adoption.

State E-prescribing Initiatives

Arizona
Arizona Governor Napolitano created the Arizona Health-e Connection in 2005 with the goal of promoting widespread EHR adoption by 2010. Part of this effort includes accelerating the use of e-prescribing across the state through the *EAzRx* initiative.

Florida
ePrescribe Florida is continuing its work to accelerate the adoption of e-prescribing through many private and public partnerships. Activities include listing certified e-prescribing vendors as a way to help physicians find a technology solution to meet their needs; education and outreach training; and a three-day seminar that brought together providers, pharmacists, vendors and others. These efforts are supported by the state's Agency for Health Care Administration (AHCA), which is the chief health policy and planning entity for the state and continues to support growth in both the private and public sectors. The Legislature has directed AHCA to promote the implementation of electronic prescribing. Additional information is available at www.eprescribeflorida.com.

Minnesota
Minnesota has long been known as a leader in healthcare delivery and financing. Governor Tim Pawlenty joined with leaders from Minnesota's largest healthcare organizations to announce the Minnesota Health Information Exchange that will connect doctors, hospitals and clinics across healthcare systems so they can quickly access medical records needed for patient treatment during a medical emergency or for delivering routine care. Governor Pawlenty recently signed legislation that mandates the use of e-prescribing by 2011.

New Mexico
The New Mexico Prescription Improvement Coalition (NMPIC) has launched a pilot project to promote the adoption of e-prescribing. During the first year, the pilot sponsored 128 physicians in New Mexico to enable them to implement e-prescribing by paying their implementation and annual subscription expenses. In all, the pilot will support participant administrative and subscription fees for two years, for up to 300 physicians, until January 2010.

NMPIC is requiring selected e-prescribing vendors to track physician-generated credits and invoice participating health plans accordingly. Vendors are also responsible for establishing the credit fund and accounting, determining physician annual subscription fee reimbursement and quarterly reporting to NMPIC. Allscripts, DrFirst, Relay Health, RxNT and ZixCorp have been selected as vendors supporting the pilot.

Four health plans serving New Mexicans and the state's Medicaid division are on board as sponsoring organizations, based on prorated market shares. Sponsoring organizations are responsible for funding pilot implementation costs. The New Mexico Medical Review Association (NMMRA), the Medicare Quality Improvement Organization for New Mexico and the organization that facilitates NMPIC, is signing agreements with sponsors and with vendors on behalf of the coalition. In addition, NMMRA is collecting funds from sponsors and acting as financial intermediary for the vendors. All contracts with health plans are in place, and all participating health plans and Medicaid are in the process of reviewing their vendor contracts.[23] The state's Medicaid program was also recently was awarded a Medicaid transformation grant to help spur electronic prescribing.

Rhode Island
The Rhode Island Quality Institute (RIQI), Department of Health, Blue Cross Blue Shield of Rhode Island, Lifespan, Quality Partners of Rhode Island, pharmacies in the state and other stakeholders continue to focus on how to accelerate the adoption and use of electronic prescribing. The group has organized a steering committee that meets quarterly and is tracking progress toward the goals set forth by the governor to promote the incorporation of health information technology into the state's medical system.
In 2007, Rhode Island received the *SureScripts Safe-Rx Award* for the second year in a row, and was recognized as the second-highest e-prescribing state in America. More than 730 physicians, physician assistants and nurse practitioners transmitted prescriptions electronically.

[23] RxHub, *Blueprint for E-Prescribing*, 2008.

Texas
The Texas Medical Association, working with SureScripts, sponsored an educational series on medication documentation, monitoring and communicating aimed at helping to identify and reduce medication errors. The series focused on benefits of e-prescribing and ways to avoid common medication errors, documentation strategies, better patient-physician communication, risk management strategies, controlled substances and tips for improving patient compliance with treatment recommendations. Physicians who were insured with Texas Medical Liability Trust (TMLT) earned a three percent professional liability insurance discount which was applied to their next eligible policy period.

Tennessee
The Tennessee Information Infrastructure eHealth Exchange Zone is being developed to transform how health information is accessed and delivered by the Tennessee care-giving community. Plans call for eHealth applications to be phased in as participation by healthcare providers grows. The solution features an online collaboration center—a Virtual Private Network (VPN)-based portal—designed to safely and securely enable such applications as e-prescribing; clinical messaging; sharing high-density images, including X-rays, MRIs and CT scans; exchanging patient information via portable health records; delivering telemedicine applications; and accessing Tennessee Department of Health applications, including the immunization registry, disease registries, death certificate applications and processing and medical license renewal.

The network has an added security component for protecting health information provided by the Covisint OnDemand Platform. The platform is a hosted solution that provides dual-factor authentication of healthcare providers using the VPN-based portal, which supports all HIPAA privacy requirements. It also centralizes, automates and streamlines access to information across healthcare communities statewide by giving physicians the ability to use many health-information applications such as e-prescribing with a single sign-on.

Tennessee is also moving toward disbursing funds in support of e-prescribing in key regions of the state. Through its relationships with physicians, payers and technology vendors, Shared Health, the nation's largest public-private health information exchange, offers ePrescribe. This Web-based electronic prescribing solution facilitates the creation and electronic transmission of new prescriptions and prescription refills. With ePrescribe clinicians can minimize medication errors, improve formulary compliance, reduce pharmacy callbacks, increase efficiency and streamline workflow. Access to ePrescribe is free to all physicians and incorporated in Shared Health's Clinical Health Record application.

Case Studies from Europe: E-prescribing in Germany and Bulgaria

While the health systems in Europe differ greatly from the United States, there are lessons to be learned about technology. In 2004, Germany passed sweeping changes to its health system, including the introduction of a universal electronic health card and

mandatory e-prescribing. Every citizen is issued a standardized health card, which is connected to a central eHealth infrastructure. These cards are a key part of the e-prescribing process, as access to any e-prescription and to a patient's medication history are linked to the patient's card. Prescriptions written by a provider are transmitted to a central server, where pharmacists retrieve them but only by accessing it with the same patient's health card. Alternatively, e-prescriptions can be stored locally on the patient's card. Patients can access their prescriptions and permission management via eHealth kiosks located in pharmacies, hospitals, large medical practices and shopping centers.

The technology brings with it efficiencies. Physicians can sign an entire stack of prescriptions using a stack-signature feature or can individually sign them with an RFID token. Authorizing and verifying information can be done with online tools, rather than manually. The German government included stringent security requirements in the technology which allow for the electronic transmission of prescriptions for controlled substances, a key challenge in the United States, which will be addressed in a later section. However, this added security and functionality can be cumbersome, as added encryption can significantly slow down the prescribing process.

Bulgaria has also embraced the use of electronic health cards as a key part of modernizing its health system, with electronic prescribing as a foundational technology. A consortium led by InterComponentWare (ICW) that included Cisco, Oracle and others worked with Ministry of Health on an e-prescribing pilot to design, develop and implement an architecture using two types of electronic cards: one for physicians and providers called the Health Professional Card and another for patients. These cards contain electronic certificates and patient identification information. A central database stores the prescription information linked by healthcare connector devices located in physician offices and pharmacies. Pharmacists download e-prescriptions using their Health Professional Card and the patient's electronic card, giving them access to the server in order to identify individual prescriptions. The database also provides prescription history, showing all medications the patient has been prescribed and has filled. This pilot has helped pave the way for additional e-health projects.

Federal Efforts to Advance Electronic Prescribing

American Health Information Community

The American Health Information Community (AHIC) is the public-private commission chaired by Health and Human Services Secretary Mike Leavitt that outlines what must be done to advance the adoption of interoperable health information technology. Several AHIC members, including Scott Serota, president and CEO of the Blue Cross Blue Shield Association, Kevin Hutchinson, former president and CEO of SureScripts, and Craig Barrett, chairman of Intel, have long advocated that e-prescribing be a top priority for AHIC. They have argued that the technology is widely available, standards exist and the overwhelming evidence that e-prescribing improves the quality, safety and efficiency of care. In November 2007 AHIC unanimously recommended that CMS be given the statutory authority to require Medicare physicians to use e-prescribing technology.

AHIC's action sent a strong signal to Congress that CMS should have such authority. Congress is currently considering legislation introduced by Senator John Kerry that would give HHS the authority provide incentive payments to physicians to adopt this technology and then a financial penalty if they do not.

Medicare Modernization Act: E-prescribing Standards[24]

The inclusion of electronic prescribing in the Medicare Modernization Act of 2003, which created the Part D prescription drug benefit in Medicare, gave momentum to the movement. The law required drug plans participating in the new prescription benefit to support electronic prescribing and laid out the steps CMS must take to develop the standards that will facilitate e-prescribing.

The first step was to finalize foundational standards that apply to all electronic prescribing done under Part D. Although prescribers were not required to write prescriptions electronically, if they do, they must adhere any standards finalized by CMS. Medicare Advantage plans offering prescription drug benefits and other Part D sponsors were required to comply with any standards to accommodate those providers using e-prescribing. The first set of standards covered:

- Transactions between prescribers (who write prescriptions) and dispensers (who fill prescriptions) for new prescriptions; refill requests and responses; prescription change requests and responses; prescription cancellation, request and response; and related messaging and administrative transactions;
- Eligibility and benefits queries and responses between prescribers and Part D sponsors; and
- Eligibility queries between dispensers and Part D sponsors.

CMS then piloted and tested additional standards in 2006, several of which were part of a final rule published in the Federal Register on April 7, 2008, and became effective June 6, 2008[25]:

- **Formulary and benefit transactions:** gives prescribers standardized information about which drugs are covered by a Medicare beneficiary's prescription drug benefit plan. Prescribers can also learn which generic drugs offer lower-cost options for the individual.
- **Medication history transactions:** provides prescribers with standardized information about medications a beneficiary is already taking, including those prescribed by other providers. This information can help reduce the number of adverse drug events and can ensure that the doctor or other prescriber has the necessary information about a beneficiary's current prescription medications.

[24] For more information on CMS' work on e-prescribing standards, please visit http://www.cms.hhs.gov/EPrescribing

[25] Compliance with the Final Rule is required by April 8, 2009.

- **Fill status notifications:** allows prescribers to receive a common electronic notice from the pharmacy telling them that a patient's prescription has been picked up, not picked up or has been partially. These notifications can help healthcare providers monitor patients with chronic conditions, such as diabetes or hypertension, by indicating whether they are taking their medicines.

The final rule also requires providers, dispensers and Part D sponsors to use the National Provider Identifier (NPI) to identify individual healthcare providers in Part D e-prescribing transactions. Adoption of the NPI will speed workflows by eliminating call-backs by pharmacies to medical offices to verify the identity of individual prescribers.

There has been significant progress in the standards-development process—far more than in any other area of health information technology. Industry and government have come together to provide a common framework that makes e-prescribing possible now. However, work remains to standardize other facets and functionality.

Overcoming the Barriers to Widespread Adoption

Like nearly every information technology, from electronic health records to computerized physician order entry, adoption for e-prescribing remains low. As Speaker Gingrich and Senator Kerry note in the foreword, a recent national survey of physicians found that only seven percent actually use the technology, and 63 percent said that implementing it was not a priority. This is despite the fact that 85 percent of physicians think e-prescribing is a good idea; 81 percent agree that it would reduce medication errors; and 65 percent agree that it would save time.

What stands in the way of more widespread adoption, and how can we overcome these barriers?

Properly Align Financial Incentives

The biggest barrier to the widespread use of e-prescribing—as well as other health information technologies—is the physician payment model. Our current payment system is simply based on the number of transactions or services that are provided, regardless of their necessity, value or quality. For those physicians and providers that use modern tools to deliver better care, they are generally reimbursed at the exact same rate as those who provide poorer care. We need a new model. Reimbursement drives adoption, be it a new test, device or treatment, and we need a reimbursement model that takes into account providers' use of technology to deliver better care.

CMS has moved in this direction. Secretary Leavitt recently launched the Electronic Health Record Demonstration that will pay 1,200 small- to medium-sized primary care physician practices to use EHRs to improve the quality of patient care. Bonus payments could total up to $58,000 per physician or $290,000 per practice over five years. That

kind of financial incentive should be the model for other payers to follow. And with e-prescribing, they have.

As noted above many national insurers, such as UnitedHealthcare, WellPoint, Blue Cross Blue Shield plans and other payers, have partnered with physicians in communities across the country to offer higher reimbursements and bonus payments for the use of e-prescribing to improve care, as well as the hardware, software, connectivity and support to implement it. Senator Kerry's E-MEDS bill also follows this model. Many of these initiatives cost physicians nothing.

But to truly drive adoption of e-prescribing or other information technology, we must go further than upfront assistance. E-prescribing saves money for everyone. The technology helps prevent medication errors and duplicative prescriptions, saving the system the costs of treating an adverse event or filling an unnecessary medication. This helps to drive down costs and make healthcare more affordable for everyone. Technology is an opportunity for collaboration, since it benefits everyone both in terms of care and costs. Incentives need to be clearly defined and the financial benefits must be well-aligned among physicians, payers and patients in order to advance physician adoption of e-prescribing.

In addition to the physician payment barrier, some pharmacies, particularly independent community pharmacies, have pushed back on e-prescribing due to costs. Network access fees are charged to pharmacy providers which in turn supports the infrastructure investments. However, these fees have been cited by some as a barrier to adopting e-prescribing solutions.

In healthcare we do indeed get what we pay for. And by paying for the right things, such as primary care and care coordination with information technology, we can in fact transform health.

Overcoming the Fear of Change and Workflow Disruption

Most physicians and providers have long-standing paper-based processes. Any potential change to normal work patterns is typically viewed with skepticism for fear of reducing productivity, making errors or angering patients with delays. These concerns are very real. A large number of physicians also own their practices, whether they are in a group or solo practitioners, so any disruption to the delivery of care can impact their bottom line as a small business owner. Implementing electronic prescribing or any technology for that matter must fundamentally address change management by accommodating and then improving existing workflow patterns.

The first and one of the most important steps in this process is to build practice-wide buy-in. Silos of acceptance or resentment can doom an installation. Everyone in the practice—all administrative staffers, nurses, and physicians—should be involved in the product demonstration and vendor selection process. Questions can be answered,

modifications can be made and a sense of ownership can be created when everyone is given the responsibility to help guide selection and implementation.

Second, practices should establish metrics that can track the performance of the technology, including time spent processing renewals, pharmacy call-backs and chart-pulls.

Third, practices should try to identify a "super-user" who receives extra training, thereby becoming a practice focal-point for questions, reporting and sharing of tools and short-cuts to others in the practice.

Fourth, practices should plan ahead to provide onsite training and assistance, particularly once the system has gone live.

And fifth, training should promote and reinforce the use of all decision-support capabilities, not just selective functions.

It is easy to see why this is daunting for many practices: All of this must be done while continuing to deliver high-quality care. That is why transitioning from paper to paperless has often been compared to changing the tires on a car while going 50 mph. Avoiding workflow disruption as much as possible is the single most important factor to successfully implement electronic prescribing and ensuring its continued use.

Practices should intensely focus on the point-of-care experience and give current patterns a critical and honest examination to determine what could be improved and how e-prescribing technology could help. This means carefully studying existing workflow dynamics and designing the technology to complement and then improve these processes, such as:

- Physically locating system components (servers, wireless routers and printers) to complement and improve care processes;
- Integrating systems and sharing data where appropriate with other office systems. Vendors can extract patient demographic information from a practice management system, load it into the e-prescribing database and create an interface that automatically exchanges new information between systems;
- Integration with an EHR or other clinical systems, to synchronize patient problem lists, medication histories and lab results;
- Setting an appropriate level of notifications. The *Health Affairs* article on physician use of e-prescribing included several stories of provides turning off alerts and pop-up messages because they were too frequent.[26] A careful balance is required to maintain meaningful alerts that improve patient safety, while eliminating alerts that prescribers perceive as onerous;
- Designing systems that are easy to learn, navigate and use;
- Deploying handheld prescribing devices to support mobility as well as desktop application options; and

[26] Grossman et al, *Health Affairs* 26, 2007.

- Using shortcuts to "Favorite Prescriptions" so that individual prescribers have the ability to enter and save his or her most commonly prescribed medications, in a specific form, dosage and frequency. Most offerings also have shortcuts to "Favorite Pharmacies" so prescriptions can be sent to a particular pharmacy within a click or two.

With patient demographics in place and with as much customization in place prior to going live, it is important to have dedicated training time for each individual prescriber. Successful training should only require one to two hours, depending on the prescriber and their appetite for technology. Similarly, office staff will require one to two hours of training and can be typically be trained in a group setting. If all goes well prescribers should be fully comfortable with e-prescribing in weeks, not months. By the end of six weeks, a prescriber should be writing the majority of their prescriptions electronically.

Adopting a new technology that changes an office and its workflow is no easy task. It requires careful planning and preparation, and there are no shortcuts. The payoff, however, is near immediate improvements in patient care and a rapid return on investment.

Finalize Additional Standards

Standards are essential to any data exchange, be it in health information technology, e-mail or on the Internet. Standards provide a common set of technical vocabularies that allow various systems or devices to exchange data in a consistent way. E-prescribing standards are in various stages of progress, with some recently finalized by CMS as noted above, but others remain in development. Many providers have pointed to this lack of uniform standards as a reason to delay adopting e-prescribing. In its 2007 report, "Findings From The Evaluation of E-Prescribing Pilot Sites," the Agency for Healthcare Research and Quality (AHRQ) agreed:

> One major hurdle to effective implementation of e-prescribing has been the inability of multiple systems to share information effectively. Lacking a standard format and vocabulary, systems do not always effectively and unequivocally communicate the necessary information among all participants in the transaction. This reduces the effectiveness and attractiveness of using an electronic system.[27]

Significant progress has been made to codify uniform standards that all stakeholders use, but the industry and CMS need to accelerate the completion of three final standards. These include:

- **Prior Authorization (PA):** The PA standard enables a prescriber to obtain real-time pre-approval from a health plan when he or she prescribes certain medications. The PA process differs from one health plan to the next, but all require written paperwork justifying the prescription. Finalizing the PA standard

[27] Agency for Health Research and Quality, US Department of Health and Human Services. Publication No. 07-0047-EF: Findings from the Evaluation of E-Prescribing Pilot Sites, April 2007.

is important because it would automate this lengthy, paper-based process. It would streamline administration by eliminating the time and resources devoted to completing paper forms. It would integrate more functionality into the e-prescribing tool, since providers who currently e-prescribe must put down the technology and pick up a paper form. Perhaps most importantly a PA standard would allow patients to begin their drug treatment sooner if the request is approved, as they now must wait days for the manual process to be completed.

- **Structured and Codified SIG:** *Signatura*, commonly abbreviated SIG, are the patient instructions for taking medications that physicians and providers include with a prescription (e.g., take one tablet twice a day). The implications of a common, universal standard on medication instructions is vital to patient safety and treatment, as noted in AHRQ's 2007 report. However, from a technical perspective the AHRQ pilots from 2006 showed that this standard needs additional work before it can be implemented effectively.
- **RxNorm:** The RxNorm standard, developed by the National Library of Medicine, provides standard names for clinical drugs (active ingredient + strength + dose form) and for dose forms as administered to a patient. The multiple drug bases currently in use by prescribing, dispensing and payer systems vary by drug name, form and dose. These differences, which must be resolved manually by the dispenser, are unnecessary drivers of inefficiencies and errors.

The lack of standards could be a reason behind recent action the Ohio State Board of Pharmacy took to investigate e-prescribing errors. The *Pharmacy Times* reported that Ohio pharmacists have caught basic errors, such as wrong drug names, wrong doses and incomplete dosing directions.[28] The article stated, "Part of the problem could stem from the fact that Ohio authorizes the use of 37 different software programs for e-prescribing, so physicians and pharmacists do not have one standard program for universal usage."

A universal set of e-prescribing standards (not a universal program or product) will ensure that all information related to an electronic prescription will be accurate, up-to-date, and have common meaning to everyone in the process. CMS must provide a firm and expeditious timetable to finalize these standards.

E-prescribing Controlled Substances

Controlled substances comprise approximately 13% of all prescriptions, including medications prescribed to treat attention deficit hyperactivity disorder, anxiety and pain. However, controlled substances cannot be prescribed electronically under current law from the Drug Enforcement Agency (DEA). This impacts both the regulation of electronic prescribing and the actual delivery of care.

[28] Pharmacy Times, "Ohio Board Says Docs Still Muddle E-Rx's," Wendy K. Bodine, March 6, 2008. Accessed June 2, 2008: www.pharmacytimes.com/EPT/2008-03-06_06.asp.

The DEA's silence on defining how controlled substance could be prescribed electronically has led some states to be creative with their regulation. For example, the DEA mandates that Schedule III-V controlled substances can be prescribed orally, i.e., by phone. Some states treat e-prescriptions as oral orders but require the pharmacist to call and verify the transmission with the prescriber, even though this process has never been approved as official policy by the DEA. Other states are far more restrictive. This variation in requirements is burdensome, particularly for pharmacies, vendors and physicians that may do business in multiple states, each with its own differing interpretations of federal law. DEA could resolve this with new regulations for all to follow.

Some argue that federal restrictions on e-prescribing controlled substances has created a "two-tier prescribing system," the perception of which has prompted many physicians to hold off on implementing the technology until this is resolved. Imagine the physician who is prescribing one controlled substance and one non-controlled substance to a single patient. Depending on the e-prescribing technology, the non-controlled substance prescription is checked against the patient's formulary, a medication history is reviewed and an automatic drug interaction check is performed. However, the prescription for the controlled substance is written by hand on paper and no formulary check or drug-interaction check. Or worse, the physician writes both prescriptions on paper because he or she is unwilling to tolerate the disruption in workflow.

While reverting to a paper prescription pad undoubtedly occurs, others believe that this problem is overstated. They argue that an e-prescribing system can use the same clinical decision-support tools on prescriptions for controlled substances as it does with all other medications; the only difference being the way it is transmitted to the pharmacy. The system can run its checks for allergies, formulary, etc. but instead of electronically transmitting the prescription to a pharmacy, the script is simply printed, signed and handed to the patient. The patient must then take the prescription to the pharmacy.

Regardless of one's perspective on how controlled substances are prescribed, everyone is in full agreement that these issues would be resolved if the DEA would simply act. The DEA has for many years been promising to finalize regulations that would clarify how controlled substances can be electronically prescribed. But they have dragged their feet by contending that paper prescriptions are preferred because they provide hard evidence should the need arise in a criminal proceeding, claiming that an ink signature and possible fingerprints on a paper prescription are better evidence than electronic monitoring.

Electronically tracking prescriptions on a real-time basis creates an audit trail and could lead to the quick identification of patients who go to multiple doctors or multiple pharmacies to obtain controlled substances. Technology exists that can authenticate a provider either through digital certificates or Public Key Infrastructure technology. Current e-prescribing networks require authentication and certification of all users and certify all prescriptions. Role-based access in e-prescribing can permit only a physician to write prescriptions for controlled substances, and this technology already exists among

the top e-prescribing products. Throw in the fact that paper prescriptions are often compromised through stolen prescription pads, forged signatures and manually altered drug quantities, and it is difficult to see why the DEA is so supportive of paper prescriptions.

Furthermore, the DEA currently requires pharmaceutical manufacturers and pharmacy wholesalers to use electronic programs to track and account for scheduled drugs. Why are electronic means sufficient for manufacturing and distribution, but not for retail dispensing? The case study from Germany detailed above shows the technology exists to e-prescribe controlled substances.

After years of strong pressure from e-prescribing proponents, most recently by Senator Sheldon Whitehouse of Rhode Island, the DEA finally submitted a proposed rule to the Department of Justice in early 2008 to allow electronic prescribing of controlled substances. It may be released publicly very soon. The DEA has also agreed to a pilot in Massachusetts to test how it can best be done. However, despite this apparent progress, federal officials and Congressional leaders remain unconvinced. Some claim that the draft regulations and the requirements of the pilot are far too onerous to the point of being unworkable and do not actually solve the central problem. Senator Whitehouse has threatened to introduce legislation that either sets a firm timetable for DEA to complete the rule or strips the DEA of its rulemaking authority on this matter. Either way it appears that progress will be made in the near future—with or without the DEA.

Delivering Comprehensive Information to Prescribers

Current e-prescribing technology can deliver valuable information to physicians and providers. Much of this information is entirely new, as prescribers do not have the capacity to know everything about a patient's medication history, allergies, current medications, insurance formulary and drug costs. One piece of information that should also be available is neutral, unbiased information regarding a drug's clinical efficacy. It seems likely that the demand for cost and comparative effectiveness research will at some point produce widely available information on medication efficacy, and when this kind of knowledge is combined with detailed patient information, such as genetic data, it would undoubtedly assist the prescribing process and deliver better care for the patient. Until that time comes, we must ensure that the information that providers see through an e-prescribing system is tailored to meet the needs of patients and their providers and is not used as a platform advance to advance anyone's commercial interests.

Universal Connectivity for Providers

There are special challenges for the 22% of U.S. family physicians who practice in rural America.[29] As with other technologies, rural practices have difficulty accessing broadband connectivity, information technology specialists and electronically enabled pharmacies. And connecting to national e-prescribing networks through a reliable

[29] American Academy of Family Physicians: Physician Profile Survey 2006. http://www.aafp.org/online/en/home/aboutus/specialty/facts/4.html Accessed June 2, 2008.

broadband service is not an option for up to a third of rural practices.[30] In addition to these challenges, rural providers often have little private investment capital available, scarce public resources, falling reimbursements and rising costs. Electronic prescribing can take a backseat to other priorities.

One program that can offer assistance is through the Federal Communications Commission (FCC). The FCC offers a $500 million grant budget for rural hospitals and health systems through the as part of the Universal Service Fund. One hospital in Alaska received $1 million per year to upgrade from a T1 line to a DS3 line, which has 26 times the bandwidth, so it can connect its facility to others in the same system located in Washington and Oregon. While private physicians cannot receive grant money for their own connectivity needs, and the funds cannot be used to purchase hardware or software, the FCC launched a pilot in late 2007 that will fund up to 85 percent of the costs of the actual infrastructure design and construction of broadband networks for rural healthcare needs.[31] With smart changes to integrate various facets of the Universal Service programs, these initiatives could help resolve the challenges that many communities face in finding reliable connectivity.

A wild card in this debate is the recent auction of the 700 MHz wireless spectrum by the FCC. This was the frequency that was primarily used for analog television signals that will no longer be used by broadcasters beginning in February 2009. This is a powerful frequency that is available in nearly every part of the country, and it was auctioned to wireless carriers like Verizon and AT&T, as well as Google, to use for more robust cellular and wireless services. This could lead to universal broadband connectivity and a broad array of devices to access these networks.

Technology nearly always grows more and more ubiquitous, from televisions and Internet usage to personal computers and cell phones. We must ensure that health information technology finds it way to all physicians and providers. With technological advances and smart policy changes, we can achieve that goal.

Conclusion

We hope that this paper gives policymakers and industry leaders a comprehensive look at the current state of electronic prescribing, exploring its value, the progress that has been made and the road that lies ahead. By presenting this report collaboratively—physician groups, hospitals, insurers, PBMs, technology vendors and employers—it seeks to make the point that e-prescribing is a tool that appeals to and benefits all stakeholders in healthcare, the most important of which is the patient. Given the agreement on its value and the consensus on the long-term goals of adoption, technology advancement and aligning incentives, it is our charge to make it happen. Let us continue our work to modernize this one aspect of healthcare and make it the starting point to broader change. It is an opportunity we cannot afford to waste.

[30] Pew Internet and American Life Project: Rural Broadband Internet Use, February 2006. http://www.pewinternet.org/pdfs/pip_rural_broadband.pdf Accessed June 2, 2008.
[31] For more information on this fund and pilot, please visit www.fcc.gov/cgb/rural/rhcp.html.