ESTABLISHING WIDESPREAD ADOPTION OF ELECTRONIC HEALTH RECORDS AND ELECTRONIC PRESCRIBING IN PENNSYLVANIA

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EXECUTIVE SUMMARY

The use of electronic health records (EHRs) and electronic prescribing (eprescribing) has emerged, as a solution to the industry's challenge in accessing clinical information from numerous disconnected clinical databases at the time the information is needed. It is clear that a key requirement for success in the adoption of health information technologies and health information exchange is the active involvement of clinicians. A further measure of success is the degree to which health care clinicians use the information available to impact the delivery of care.

Throughout the great State of Pennsylvania there are numerous examples of EHR and eprescribing adoption and utilization. These stories need to be told. Physicians, pharmacists, payers, and patients are looking for real life examples showcasing the benefits and value of implementing these solutions as well as the incremental steps to take for long-term success. Pennsylvania's hospitals and health systems are outpacing hospitals nationally in their adoption and use of clinical HIT systems. Out of all states in the U.S., Pennsylvania ranked 12th based on the number of prescriptions routed electronically as a percentage of total eligible prescriptions in 2006 according to a survey conducted by SureScripts[3].

The widespread adoption and use of electronic health records and electronic prescribing results in a win-win strategy for patients, physicians, health care providers, pharmacists and payers, working together in partnership to ensure a safer, more efficient and cost effective healthcare delivery environment for all. This paper dispels myths regarding healthcare provider adoption of health information technologies and outlines a series of steps health care policymakers, payers, venders and providers should take to ensure the widespread use of these vital technologies. Pennsylvania eHealth Initiative (PAeHI) stands ready to move the adoption of EHRs and electronic prescribing in concert with the following recommendations:

1. Adoption incentives such as tax credits, grants and loan programs to assist healthcare providers and support physicians in the initial installation of EHR and eprescribing solutions;

2. Use incentives such as pay-for-performance programs, reductions in malpractice insurance premiums and group discounts from healthcare IT suppliers should be put in place to help reduce and underwrite the ongoing operating cost of these systems;

3. Policy incentives and programs can include accreditation programs such as JCAHO 2005 Hospitals' National Patient Safety Goals, employer programs such as Leapfrog and others, and Medicare support for economic incentives;

4. Advancement of, and adherence to, a single set of national health IT, privacy and security standards and policies such as CCHIT certification of inpatient and ambulatory EHRs;

5. Increase broadband availability and choice in order to increase access to clinical health information exchange and to drive down related communication costs;

6. Funding of regional health information organizations (RHIOs) for incorporating electronic prescribing to help promote regional networks of pharmacies and physicians to use electronic prescribing leveraging networks currently established through RxHub and SureScripts;

7. Non-economic incentives or mandates for payers to push them to fund electronic prescribing efforts with the requirement that they support projects that include all regional payers, physicians and patient populations;

8. Use EHRs to replace current public health reporting burdens on health care providers such as immunizations and communicable disease registries;

9. Access to embedded decision-support functionality which is needed to be an integral part of today's eprescribing and EHR applications; and

10. Educate physicians, pharmacists and the public around the issues of using technology to improve patient safety and drive efficiencies.

INTRODUCTION

Pennsylvania Prescribes High Quality Health Care

Pennsylvania is known as the Keystone State, and living up to its name, Pennsylvanians are taking a central role in accelerating the adoption of electronic health records (EHRs) and electronic prescribing (eprescribing). Collaboration remains the keystone of the stakeholders' commitment to lead an effort that will ensure healthcare is being delivered in a safe, effective, efficient and timely, patient-centric manner.

The advantages of using EHRs, and eprescribing whether as a standalone or integrated solution have been well demonstrated and support the delivery of high quality care. There are also significant cost savings in adopting technologies that create not only administrative efficiencies but promote clinical best practices.

A recent RAND analysis estimated that national adoption of the EHR could lead to "more than $81 billion" in annual savings, at a time when healthcare spending in the United States has soared above $2 trillion amounting to an average of $7,000 per person. It has been estimated that information exchange across providers, hospitals, public health and payers could save $77.8 billion per year.[1]

Government options and support to increase eprescribing could reduce federal health expenditures by up to $29 billion over the next decade by helping physicians to prevent nearly 1.9 million adverse drug events (ADEs) during the same time period, where individuals otherwise would have been sickened, hospitalized or killed by serious medication errors.[2]

In August 2006, Congress passed legislation removing a key obstacle that would encourage rank-and-file physicians to adopt electronic medical record systems: the heavy cost burden on smaller, independent and outpatient practices. The change permitted hospitals to help fund the purchase of EMR systems by physicians in their service areas without risking penalties under the 35-year-old Stark law and anti-kickback statute.

In October 2007 The Centers for Medicare and Medicaid Services announced it would reward 1,200 small medical practices adopting e-health records systems. The doctors' offices must use the systems and comply with recognized quality guidelines for treating patients.

In a November 2007 blog entry (http://secretarysblog.hhs.gov/my_weblog/health_it), Health and Human Services Department Secretary Mike Leavitt urged large healthcare payers, including Medicare and Medicaid, to begin making electronic prescribing a requirement of the doctors they pay.

THE CURRENT TECHNOLOGY ADOPTION LANDSCAPE

While most agree the introduction of technology in the clinical setting enables numerous possibilities for driving the use of data, improving quality through best practices, reducing errors and adverse events and improving efficiency, the majority of group practices today do not utilize EHRs or eprescribing. Nationwide, of the approximately 560,000 practicing physicians there are currently more than 35,000 healthcare providers who actively eprescribe. Based on American Medical Association (AMA) estimates for office-based physicians, this means that approximately 6 percent of office-based physicians are eprescribing today. These eprescribers are using both stand-alone eprescribing applications or as part of an integrated electronic health records solution.

Pennsylvania's experience shows them as one of the nation's leader in use of EHR and eprescribing. Based on a recent report entitled "National Progress Report on ePrescribing" produced by SureScripts, Pennsylvania ranked 12th based on the number of prescriptions routed electronically as a percentage of total eligible prescriptions in 2006.[3]

It's All In a Name, Or Is It?

Multiple terms have been used to define electronic patient care records, with overlapping definitions.[4] An electronic health record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports. The EHR automates and streamlines the clinician's workflow and has the ability to generate a complete record of a clinical patient encounter - as well as supporting other care-related activities directly or indirectly via interface - including evidence-based decision support, quality management, and outcomes reporting.[5]

The benefits emerging from use of full-functioning EHR systems have been identified and include:

- Increased compliance with preventive care guidelines.
- Ability to exchange health information for improved transitions of care management.
- Better coordination and management of chronic conditions.
- Optimized medication prescribing and administration.
- Reduced adverse drug events.
- Support the practice of evidence-based medicine.
- Reduced staff time spent on paperwork and documentation.
- Reduced redundancy of laboratory and imaging services.
- Increased accuracy of coding and more-timely billing services.

Electronic Prescribing (eprescribing) is the use of an automated system that provides prescribers access to vital patient information regarding medication history, drug benefits and eligibility, formulary and prior authorization requirements at the point-of-care. The eprescribing software then facilitates creating a prescription that has been evaluated for potential allergy or drug interactions and allows for electronic transfer directly to the patient's pharmacy of choice—rather than writing the order on paper, handing it to the patient, and hoping it will be delivered and filled correctly. Physicians and clinicians write more than 3.5

billion prescriptions each year and between 1.5 percent and 4 percent of these prescriptions contain errors that have a potentially detrimental effect upon the patient.

Approximately 70 percent of the safety and savings advantages of eprescribing result from doctors being given immediate access to patient medication histories, safety alerts, preferred drug options, and pharmacy options so that they can better assess affordable choices before prescriptions are transmitted to the pharmacy.

The most frequent source of error is miscommunication between the provider and the pharmacist. Communication errors occur most often from illegible handwriting, unclear abbreviations and dose indications, unclear telephone or verbal orders, and fax-clarity problems.[6] The need for clarification on prescriptions result in pharmacists making over 150 million calls on an annual basis to physicians, seeking additional information, adding resources and cost to an already overburdened system.[7]

Benefits from eprescribing solutions have been identified to include:

- Patient safety improvement by dramatically decreasing medication errors.
- Improved efficiency for prescription creation with automated decision-support.
- Effectively and more efficiently refill and renew multiple prescriptions.
- Lower drug costs with formulary compliant prescribing or ability to prescribe lower cost alternatives and generics.
- Enhanced communication between physician, patient and pharmacy.
- Lower the administrative burden and costs due to a reduction in the number of callbacks from pharmacy to physician office regarding prescription clarification.

Both technology solutions are gaining momentum and support, with eprescribing being touted as a "toe in the water" approach to more widespread use and adoption of true electronic health records.

A key force in driving change is demonstrated by the value and benefits these technologies hold for each of the impacted stakeholder groups. Improving patient safety and clinical outcomes, and enhancing communications amongst healthcare professionals as well as with their patients, have the potential to reduce the rate of growth in healthcare costs. In an environment of decreasing provider reimbursement, these factors as well as increased practice efficiency, are strong motivation to embrace this inevitable transformation.

Patients have been impressed and pleased to see their prescriptions are being written using technology that informs the physician at the point-of-prescribing. A recent *Wall Street Journal* Online and Harris Interactive Poll surveyed 2,153 U.S. adults and more than three-quarters of respondents agree that patients could receive better care if doctors and researchers were able to share important health information through electronic interchange and 63 percent agreed that sharing of these records would decrease medical errors. There are also the convenience and cost factors that weigh favorably from the patient's perspective. Having their prescription ready at the pharmacy when they arrive and maximizing their drug benefit with formulary compliant medications or generic and lower-cost alternatives increases patient satisfaction with their physician and the pharmacy.

Access to embedded decision-support functionality is an integral part of today's eprescribing and EHR applications. Quick access to automatically updated databases of all drug names, formulations, dosage options, potential side effects and instructions are especially helpful for efficient script writing. Perhaps more important are the alerts that today's systems display to the prescriber related to potentially dangerous drug-drug and drug-allergy interactions, as well as guidance on the patient's insurance formulary, notifications on prior-authorization requirements and drug recalls. All of these features help prescribers to determine the safest, most appropriate and cost-effective medications before the patient has left the office.

THE PENNSYLVANIA LANDSCAPE

Today, state leaders are recognizing that health information technology (HIT) and health information exchange (HIE) can help to address many healthcare challenges. However, the development of HIE has been, for the most part, driven by local and grassroots efforts since healthcare services and patient healthcare experiences are primarily local.

Physicians, clinical service providers and patients live with the realities of highly fragmented, inaccessible and expensive patient-specific clinical information delivery and retrieval every day. Early applications of information services focused on the administrative side of healthcare delivery and have been successful in gaining widespread adoption. In order to impact quality, safety and improved clinical outcomes it is imperative we put the seriously needed attention and resources to patient clinical solutions, where our citizens seek care locally.

Pennsylvania shares many barriers and challenges with other states:

- Fragmented healthcare delivery and financing environment.
- Historic economic pressures and restructuring serve as challenges and drivers.
- Geographic, service scope and diversity call for coordinated local solutions.

Pennsylvania also has unique strengths and experiences that can be built upon to help ensure success:

- Vision, leadership, landmark policy and program alignment.
- Critical mass of stakeholders.
- National caliber IT capabilities and foundation of experience.
- Recent change in mandates regarding scope of practice responsibilities.

The requirement for electronic prescribing, which we will refer to as the "electronic prescribing mandate," is one of several provisions of the proposed **Pennsylvania Health Care Reform Act (HB 700)** that target improvements in patient safety. The patient safety benefits of electronic prescribing are self-evident. It eliminates the confusion that may occur with handwritten prescriptions. It may alert the physician to drug allergies and drug interactions. It may identify non-compliance with medication treatment regimens, which potentially could result in adverse outcomes and additional stress to an already overburdened healthcare system. Despite its obvious benefits, electronic prescribing has only modest adoption rates by Pennsylvania physicians.

Pennsylvania health insurers have been proactive on electronic prescribing. In 2005, **Highmark Inc.** donated $26 million to the Pittsburgh Foundation to create the **Highmark eHealth Collaborative** (www.highmarkhealth.org). The collaborative offered grants to assist physicians in Highmark's service area to adopt eprescribing in their practices. Grants were available for both standalone and integrated eprescribing systems. The Collaborative, however, encountered difficulties gaining tax-exempt status as a 501c3 entity from the Internal Revenue Service. As a result, the $18 million allotted for the eprescribing grants has not been released.

CMS recently adopted an "exception" from Stark for certain electronic prescribing and electronic health records arrangements. Likewise, the Office of Inspector General (OIG) adopted a "safe harbor" from the antitrust statute for certain electronic prescribing and electronic health records arrangements. Both of these took effect October 10, 2006 and may be found at http://www.oig.hhs.gov/fraud/safeharborregulations.html.

The ambiguity and uncertainty as to how to both interpret and to be compliant with these rulings in providing incentives to physicians for using EHRs and eprescribing has resulted in additional roadblocks to adoption by some entities. Because this uncertainty exists, organizations need to carefully research and choose the most advantageous structure, while minimizing risk for violations.

As for the Highmark initiative—the "success" take-away is their demonstrated commitment to support not only their consumer, but also physician membership, with tools that promote patient safety, improve practice efficiency and reduce cost. The readiness and enthusiasm of the physician community to engage in this new technology was demonstrated by the unprecedented response to this initiative of more than 1,740 applications representing more than 4,600 physicians.

STARK & ANTI-KICKBACK

On March 26, 2004, the Centers for Medicare and Medicaid Services ("CMS") released new regulations interpreting the 1995 federal physician self-referral prohibition commonly known as the "Stark Law." The Stark Law governs the financial relationships between physicians and entities to which they refer certain designated health services ("DHS").

The Anti-Kickback statute states that "criminal penalties will be issued for individuals or entities that knowingly and willfully offer, pay, solicit, or receive remuneration intended to induce or reward referral of business reimbursable under any of the Federal health care programs, i.e., Medicare, Medicaid, or other Federal Health Care programs."

A safe harbor is a "provision which would specify various payment and business practices that would not be treated as criminal offenses under the anti-kickback statute, even though they may potentially be capable of inducing referrals of business under the Federal health care programs."

The **University of Pittsburgh Medical Center (UPMC),** is trailblazing the EHR space by making the adoption and utilization of electronic medical records is a reality. Through a joint initiative with Israel/Pittsburgh based dbMotion the initiative is characterized by:

- implementing an interoperable platform that connects virtually all clinical systems into one "shared" record.
- extending this platform to achieve semantic interoperability – enabling functionality that is "aware" of the meaning of data and make use of that information to support more physician friendly-behavior of applications.
- instilling a platform that enables UPMC to implement new applications that make use of (leverage) the information and services in other information systems.

In other words, dbMotion will be breaking down the walls between the silos of information at UPMC (which exist at practically every healthcare organization) and positioning UPMC to better manage quality, reporting, physician relationships and public health. This project will also set the infrastructure for UPMC to share information, services and other resources with other healthcare organizations in it geographic area.

This integrated, interoperable technology solution, called electronic health record, or eRecord, allows healthcare professionals throughout western Pennsylvania access to accurate up-to-date, real-time information such as vital signs, test results and medication history. At the same time, they are also increasing quality and patient safety, while leading the way in what has been called a national healthcare priority. An automatic prescription-writing feature allows physicians to prescribe medications online and print out a typewritten prescription for patients, reducing the chances of handwritten prescriptions being incorrectly interpreted. By listing both brand and generic names, the application helps physicians communicate clearly about sound-alike drugs. The eRecord solution also provides the right drug choices and check-off boxes for specific dose levels, so physicians can be confident they're prescribing the correct drug and the correct dosage.

Independence Blue Cross (IBC) Independence Blue Cross (IBC) began its ePrescribing initiative in December 2005 seeking to enroll 500 healthcare professionals with a focus on reducing drug prescribing errors and lowering pharmacy costs. The initiative initially targeted high prescribers, high non-formulary prescribers, and high non-generic prescribers. Essential to the program is a handheld personal computer and wireless access within the physician's office. Early experience indicated that providing physicians with the tools they need at the point of care enabled them to make better care decisions for their patients. The IBC initiative continues and 250 more prescribers are expected to be deployed by May 2008. Increased use of formulary and generic drugs, as well as positive feedback, has been noted from the participants who are actively eprescribing. During the initial phase of the initiative, several success factors were identified that encouraged continued participation by the prescribers in the program:

- Face to face training at an individual level
- Readily available customer support
- Software that is easy to use and works within office workflow
- Ongoing monitoring of utilization and intervention to address issues when utilization drops for more than two weeks.
- Development of a practice champion, such as a physician or practice manager, to support the practice users and administrative staff

In March 2007, **Capital Blue Cross** announced its offering of a comprehensive eprescribing service to physicians. This fully managed eprescribing service from Prematics provides the prescriber with a handheld ScriptTone^{SM} eprescribing device, installs connectivity, integrates with the practice's "Practice Management System" installs the software, provides the prescription printer and conducts training all free of charge to physicians within Capital Blue Cross's 21-county network. The goal of this initial deployment is to enroll 1,500 physicians within the first 18 months. Physician adoption rates in response to this offering have been strong. More than 400 prescribers have signed up for the ScriptTone service since its launch. More than 100 physicians are actively using the service today. Physician utilization rates are also strong showing that Prematics users are generating electronic prescriptions at almost twice the industry norm. Benefits cited from using this standalone eprescribing service included timesavings due to reductions in administrative time servicing pharmacy clarifications, ability to write accurate prescriptions in a more timely fashion having access to medication history, ability to check for drug-drug interactions and the ease-of use. The no-cost, fully managed offering was cited most often as the reason for choosing this eprescribing solution.

A national leader in EHR implementation is **Geisinger Health System**, which has successfully accelerated the widespread use of an electronic health record with its 670 physicians working in 42 clinics in more than 31 counties with 100 percent adoption. Physicians report improved care processes, enhanced patient-physician communication and a patient satisfaction rate of 99 percent. The current system does not have an eprescribing component built in, but a current plan is underway to introduce this functionality in 2008. Anticipated benefits with this new capability include increases in patient convenience and satisfaction, feedback on patient adherence to treatment regimens and overall improvements in quality tracking.

Located in central Pennsylvania north of the capital, Harrisburg, **Susquehanna Health System** treats some 14,000 inpatients each year with a staff of 3,000 employees, including 210 active physicians, nine of those being radiologists. The organization saw the need to improve access to medical images and information for physicians who were geographically dispersed, while enhancing the overall responsiveness, productivity, efficiency, and quality of care of these radiologists. A Picture Archival and Communication System (PACS) was deployed to provide access to images from multiple remote locations in less time, enabling faster diagnosis and better treatment.

Saint Vincent Health System is at the forefront of transforming the way its physicians communicate around health care decisions with the implementation of two important medical information systems - HITEC at Saint Vincent Health Center and the Allscripts electronic health record (EHR) throughout Saint Vincent Medical Group practices. In the future, these two systems will be integrated so that Saint Vincent physicians in the Saint Vincent Emergency Department and throughout the Health Center will be linked to providers in practice sites for seamless access to patient information when and where they need it.

Throughout the great State of Pennsylvania there are numerous examples of EHR and eprescribing adoption and utilization. These stories need to be told. Physicians, pharmacists, payers, and patients are looking for real life examples showcasing the benefits and value of implementing these solutions as well as the incremental steps to take for long-term success.

Four-fifths of physicians in the U.S. work in small practices and account for 88 percent of all outpatient visits.[8] To truly influence the widespread adoption of HIT it is important that we understand and overcome barriers to its adoption in small practices. These practices not unlike larger physician practice settings are characterized by complex workflows that are not adequately addressed by standardized HIT systems.

HIT adoption requires more than a mere structuring, designing, or purchasing of a system solution. It involves significant organizational change, which requires strong leadership, clear formation of objectives, maintaining a shared vision, solving existing organization and interpersonal problems and establishing ownership from all staff.   Successful implementations typically are led by a physician champion, who takes on a leadership role in stewarding the solution through deployment.

ONE SIZE MAY NOT FIT ALL

There is strong industry opinion that in the near term, there is sufficient market opportunity to offer both a standalone eprescribing solution as well as an integrated EHR. The high cost of entry for the small 1-2 physician practices, tends to discourage initial adoption of a full EHR implementation. They don't have the time, they don't have the infrastructure, and they don't have the IT staff to support and maintain the service and they don't have the money.

EHR adoption in the United States has been hampered by a number of factors including steep software costs and complex installation and technical requirements. Research studies also indicate that adoption of EHRs strongly correlate with practice size and payer mix. Adoption rates seem to be lower in smaller practices, those not affiliated with hospitals and those that do not teach medical students or residents. In addition, findings also imply that the higher proportion of privately insured patients in physicians' practices encourages EHR adoption. The future may require a low-cost, interoperable, distributed solution that allows systems to communicate directly with one another. The industry is just beginning to see these systems emerge on the horizon.

Pennsylvania's physician make-up is as diverse as the landscape from one end of the state to the another. It is not easy for EHR solutions to meet the needs of all the practice variations, geographic locations and specialty mix and practice size. Eprescribing can immediately offer significant value and benefits to physicians, pharmacists, payers, patients and insurance companies until the market matures and is ready for a broader e-health solution.

In the short term, there should be room for both solutions in the Pennsylvania market. Given the magnitude of the changes and costs these solutions entail, taking an incremental approach may ensure long-term success and sustainability. Standalone eprescribing offerings must be able to integrate and evolve over time to continue to offer additional features, or migrate to a full EHR when the time is right. We believe there is continued value for both as they provide a migration path, a gateway to full e-health adoption.

Other industries have taken incremental steps as they moved towards electronic records, connectivity and interoperability. They automated individually and then collectively, they collaborated to connect, share and process information. An example of incremental steps towards an integrated system is illustrated by the banking industry. From the time of early deployment of "bank-specific" automatic teller machines (ATMs) to the formation of "shared ATM networks" was over a span of 10 years. Once the value was proven through cost and efficiency savings, convenience for the consumers, efficiency for all banking partners—the transformation was accelerated.

Physicians

Workflow & Efficiency—*Adoption and use of e-technology will solve all our problems*
Deploying an EHR and eprescribing solutions will not automatically fix organizational problems, nor does it guarantee improved efficiency and quality. The fact is, that automation will not only accelerate current issues within the organization, but may even unveil some new ones. Today, EHR and eprescribing vendors tout their ability to meet physician's requirements in building solutions that mimic the way they and their practice operate (workflow). The fact is that an electronic record is more than a paper record displayed on a computer screen. To truly benefit and maximize the advantages from EHR and eprescribing utilization, evaluation of current workflow and identification of the most effective and efficient processes need to be made. Unless the adoption of an EHR or eprescribing solution is coupled to both significant process change and payment reform that creates a sustainable business case for quality and care management, EHRs will not meet their promise.

Complexity – *EHR is the right solution for everyone*
Achieving success in EHR and eprescribing selection, configuration, and implementation is complex simply because there is no standard EHR/eprescribing system, implementation plan or configuration. We are moving closer to this reality with the work established by Certification Commission for Healthcare Information Technology (CCHIT) whose mission is to accelerate the adoption of health information technology by creating an efficient, credible and sustainable certification program.

It is often a difficult process for potential users to achieve a common "vision" among key stakeholders in identifying both current and future needs and selecting the right vendor to deploy a well-matched system.

Choosing the right EHR solution can be a lengthy process. There are numerous applications with similar capabilities at a variety of price points. Currently more than 200 EHR vendors have the perfect solution. Varying practitioner needs and priorities and disparate environmental factors such as technical infrastructure require additional product customization, making that choice even more arduous.

A significant percentage of practices that implemented EHR have had to pay someone to de-install it due to lack of information provided to them by the vendor during the initial process.

Costs – *EHR is affordable and easy to maintain*
There are many stages and costs associated with Electronic Health Record implementation. Physician practices often do not understand the total cost of ownership. EHR acquisition often requires a significant capital investment for computer hardware, complex software necessary to integrate/implement the EHR and the expense of intensive data entry required from multiple sites, (e.g., laboratories, diagnostic facilities, and ambulatory treatment centers). Along with the initial upfront capital investment in hardware, infrastructure and software, there are ongoing support costs. Healthcare providers are faced with many decisions about ongoing support fees: Should they lease hardware? Should they buy it? How do they perform system back-up? Over time, the systems will require security updates, software patches and hardware upgrades all at additional cost. Technical support in the

case of EHR maintenance is expensive and may cost 15 percent to 20 percent of the software application package.

The "hard cost" of EHR does not factor in other costs, which are equally weighty and include planning, change support, implementation time and impact on productivity.

Commonwealth Fund-supported research in 2005 by Robert Miller, Ph.D., and colleagues at the University of California, San Francisco, finds that for small group practices with EHRs, initial costs average $44,000 per physician (or nurse practitioner), with ongoing costs averaging $8,400 per physician per year.[9]

While these expenses may seem steep, the researchers estimate that the average practice would cover its costs in less than three years and, after that, profit considerably. Still, most physician offices spend more time at work initially. And some practices faced substantial financial risks, including long payback periods, billing problems, and data loss. These unknown risks and the lack of guarantees regarding ROI and efficiency returns are often not realized until the latter stages of implementation. The jury is still out on the magnitude of an investment return, as EHR adoption and use still relatively immature and lacks a critical mass experience. Anecdotally from a patient safety perspective, physicians report the benefits of using EHR and eprescribing solutions outweigh the challenges.

Implementation – *EHR implementation is simple and straightforward*
There is a tremendous amount of support required to aggregate high-quality data for improved patient care. For patients with chronic disease, co-morbidity and extensive medical records, decisions must be made as to how much and what data should be loaded into the EHR initially.

EHRs become more powerful when decision-support tools are embedded in the solution. These provide not only timely information, but help clinicians turn that information into actionable knowledge.

Ongoing training and support is needed, typically ranging from two weeks to as long as 18 months, and some experience would suggest depending on turnover and addition of new features and functionality, ranging from years to decades. This lengthy process incurs large disruption costs due to workflow modifications and adds a variety of technological and administrative burdens.

If an EHR system malfunctions or is corrupted, typically technical and specially trained clinical professionals are required to perform maintenance. As a result, time is lost until the systems are back up and running and physicians must revert back to paper-processes.

The implementation of EHR solutions is not just about the information technology; it is about transforming clinical and business practices. EHR, electronic prescribing systems and other health information technologies are an enabling foundation for healthcare—and organizational—reform. The technology does not, in and of itself, cause the reform.

Usability/Adoption – *A major obstacle to EHR adoption*
There's no doubt about it—electronic prescribing changes both the physician's workflow and the office's workflow. What can either make or break success in the short and long term is how well the deployment has been planned, and how prepared both physicians and staff are to embrace the new technology. In most cases, at least for single new prescriptions, it is still faster for a physician to grab a prescription pad and write a prescription. Faster, yes, but that

does not always equate to better for office efficiency or improved safety for patients. Putting down a pen and pad and picking up a mouse requires a cultural shift. It has been clearly demonstrated that systems, which are not user friendly, are not easily adopted.

Designers of some EHR systems are now trying to accommodate the many types of users and address varying styles of workflow. Clinicians require the appropriate tools to retrieve and understand data relevant to their decision-making tasks.

EHR systems do not always provide the ability to customize and allow for flexibility in the way users enter data. Most EHRs come with template forms in which the user has to enter data in the fields provided. As a result, the user has to understand the whole system before he/she can start working on it.

Like a string of Christmas lights, EHR only works if every "bulb" is plugged into the string. If all physicians do not consistently use the EHR system, critical information regarding visit findings and treatments will be missing, lending to a less than complete record. If information is perceived to be missing or incomplete the system becomes unreliable and physicians may discontinue use. Many times, a practice will implement an EHR, and then either not utilize some features or functions of the system or not use the system at all.

EHR has a substantial learning curve and will slow physicians down at least initially. Planning for this learning curve by limiting the number of patients they can see in a day, and expecting the short term need to spend more time interacting with a computer system than with the patient leads to better implementation. Key to successful EHR adoption is complete training to encourage use of all features and functions that the system has to offer. Misunderstanding of the system capabilities as well as limitations can lead to unexpected errors. Just as with traditional paper processes, users must always validate that the action taken, reaps the intended results.

Interoperability – *It's solved, what's standing in the way now?*
Despite undeniable advances, most hospitals and physician practices are years away from full-scale EHR and for those that do use it, there is little, if any, way to share information outside the walls of their own institutions. We may have solved the local connectivity and interoperability issue when moving data within a given practice or institution, however, moving outside the walls of a discreet organization requires more than agreement on technology infrastructure. Decisions must be made regarding standard business practices, policies and procedures to determine what data is to be shared, how that information is to be accessed and what it will look like once it moves from provider to provider.

Healthcare and software industries have been slow to adopt technical standards that are needed to allow different computer systems to talk to each other, mitigating the full efficacy of EHRs. Successful adoption means physicians must be using these technologies, however we as an industry need to also pay attention to other key stakeholders in addressing readiness and approaches to move past barriers.

PHARMACISTS

To appreciate pharmacists' hesitation to adopt electronic prescribing, we need a thorough understanding of this industry's business practices and workflows.

Workflow & Efficiency-*Our current workflow is streamlined-- don't rock the boat!*
Americans are taking a record number of drugs. Up to 30 percent of the 3.5 billion prescriptions written annually require dispenser calls for clarification. By 2030, there will be 71 million American older adults accounting for roughly 20 percent of the U.S. population. The cost of providing healthcare for older Americans is five times greater than those under 65. A typical 64-year-old person will take 6 prescription drugs on a regular basis. The average number of concurrently used prescription medications rises to 12 at age 75.[10] Add to this the current pharmacist shortage of approximately 5,500 positions (out of approximately 120,000 community pharmacists) for a vacancy rate of slightly less than 5 percent.[11] it becomes clear how any additional workflow disruption could have significant consequences.

Today pharmacists generally screen or perform prospective review of a patient's medication regimen during the prescription dispensing process to prevent drug-related problems that, if uncorrected, might lead to adverse effects or failure to achieve treatment goals. Prospective drug utilization review (PDUR) became legally mandated for Medicaid patients following the implementation of the Omnibus Budget Reconciliation Act of 1990 (OBRA '90) in January 1993. It is clear how eprescribing will provide efficiencies by prior checking of patient's medication history and drug benefits, but in the short term, the ability to maximize efficiency is lost.

Costs – *EHR and eprescribing systems are affordable and easy to maintain*
Costs for implementing eprescribing in each pharmacy in Pennsylvania will vary, depending on a number of issues. These issues range from whether it is a chain or independent pharmacy, computer software vendor, computer hardware and software capabilities, and Internet capabilities, as well as other issues. At present, 100 percent of chain pharmacies and over 95 percent of independent pharmacies in Pennsylvania have computer software from a vendor that is interoperable with at least one eprescribing transaction network. An individual pharmacy, however, may have other computer issues such as outdated hardware or software, which would need to be upgraded before being able to participate in eprescribing programs. Also, Internet connectivity may be an issue for some rural pharmacies. Upgrade costs could range from hundreds to several thousand dollars depending on the current state of the computer system.

The large majority of pharmacies in Pennsylvania now bill prescription insurance claims electronically over the Internet in HIPAA-compliant claims; similar connectivity is used for eprescribing and, therefore, the connectivity is generally not an issue. Unlike the prescriber, however, the pharmacy is faced with transaction costs. Some pharmacy software vendors charge a start-up fee and a monthly fee to provide eprescribing services. All vendors charge at a minimum, a per-transaction fee for receiving electronic prescriptions and sending electronic refill requests. Minimal per-transaction fees range from $.16 to $.32 depending on the software vendor and the transaction networks.
In most cases these charges are not being shared by the insurer, patient or physician, all who benefit from the increased safety, efficiency and cost impacts.

Usability/Adoption – *A major obstacle to EHR adoption*
A goal of eprescribing from the pharmacy standpoint is to help improve workflow. Generally, electronic prescriptions are received in a queue managed by the pharmacy software system. Pharmacists or pharmacy technicians may select prescriptions from this queue to be filled, either in the order received or from a list to handle the patient waiting in the pharmacy. Having this functionality automated can help workflow—eliminating phone calls and faxes previously used to receive and clarify prescription orders. As eprescribing progresses with

additional EHR functionality such as allergy checking and formulary checking, additional time savings may be realized.

Meanwhile, for pharmacies that are receiving few electronic prescriptions, the workflow may actually be disrupted. While QS/1 Data Systems (the primary pharmacy software vendor used in Pennsylvania by independent pharmacies) has participated with various eprescribing transaction networks for over 12 years only about 1% of prescriptions received at pharmacies with their software were electronic in 2006.[12] Until this becomes a much larger portion of prescriptions received at pharmacies, the handwritten, telephoned, and faxed prescriptions will likely get more of the attention at these pharmacies. As eprescribing adoption becomes more widespread, this possible disruption will lessen or be eliminated.

Ideally, eprescribing results in real work flow efficiencies. When prescriptions are sent directly from the physician's computer to the pharmacy's computer, data entry is eliminated. However, in reality, many eprescriptions do not go directly to the pharmacy's computer, but go, instead, to the pharmacy's fax machine. When an electronic prescription is sent to a pharmacy that is not set up to receive it electronically, the prescription converts to fax. The potential impacts are that fax transmissions take a lower priority, may experience transmission problems, and can result in transcription errors. Because of these challenges and the lack of training and education, electronic prescribing is not considered a "valued" technology by pharmacies.

Implementation--*What difference would one more system make?*
Currently electronic prescribing systems vary widely in their features and capabilities and may not produce the best results for patient safety and health. Because of their limitations or due to design flaws, eprescribing may inadvertently introduce new kinds of errors into the process. For example, if pharmacists or pharmacy technicians assume that computer-generated prescriptions are free of errors, they may be more likely to fill them blindly, without checking them.[13] Errors introduced at the time of creation the prescription from an EHR or e-prescribing system might include:
- Wrong patient name selected from automated list
- Wrong diagnosis for patient identified
- Alerts may be inactivated or ignored
- History alerts may not be up-to-date or records of other prescribers may not be available
- Drug benefit or formulary may not be up-to-date
- Some menu designs can increase wrong dosing choices
- Delayed transmission of the prescription

Connectivity—*Everyone is wired and ready for business*
Many pharmacies across Pennsylvania report they do not yet have broadband access. About a third of respondents use a dial-up connection to submit claims. However, of the approximately 70 percent of pharmacies that submit claims electronically, 93 percent use DSL, cable, or T1 connections.

Chain pharmacies in Pennsylvania are already equipped to receive electronic prescriptions and send electronic refill requests. It is expected that as interoperability with physician software improves the software vendors for both chain and independent pharmacies will continue to provide updates to their systems to accept the information. For instance, as EHR information such as drug allergies can be transmitted, this information will likely be made available to pharmacies.

MOVING CLOSER TO REALITY

Targeted Efforts to Drive Physician Adoption

It is clear that both pharmacies and physicians must be prepared and coordinated for eprescribing to realize the patient safety benefits and resulting cost savings that we are seeking. We must identify the contributions and rewards that will drive adoption.

The **Pennsylvania Medical Society's ConnectTheDocs** project is designed to facilitate the adoption of broadband by physicians who currently do not have broadband access. For those practices that are using broadband, the Society intends to encourage and support physicians' efforts to improve the speed and quality of their broadband access to the optimum level for use of an array of health information technologies, including eprescribing.

The project will expand broadband network technologies to physician practices in which broadband is not currently used or available and improve healthcare in Pennsylvania, especially in rural areas. For physicians who already use broadband in their practice, this project could potentially offer higher quality broadband access or lower rates.

Encourage and provide funding to physicians for the implementation of electronic prescribing as we have discussed, "free" electronic prescribing solutions generally have some associated costs and may not be the best solution for every physician.

Medical professional liability insurance carriers providing discounts on professional liability insurance premiums are assisting in promoting adoption for some physician practices.

Midwest Medical Insurance Company (MMIC) announced in September of 2007 that it would offer a premium credit to any solo physician or physician group policyholder who implements and uses electronic medical records software, with credit to begin Jan. 1, 2008. To receive premium credits of 2 percent to 5 percent, a physician group must meet the following requirements:

- The EMR/EHR system must be certified by the Certification Commission for Healthcare Information Technology (CCHIT).
- The physician group must have implemented or plan to implement the latest vendor updates for their system.
- At least 75 percent of the physicians in the group must be using the EMR or EHR.
- The group must have been using the EMR or EHR for at least a year.
- The group must be using at least two of the six EMR/EHR functions listed on the application.

Given the patient safety benefits of electronic prescribing and other technologies, physician adopters should be given a premium discount. The Society proposes a tiered approach by which a discount would be given for each of several health information technologies adopted and used by the physician. Discounts would be capped at a fixed percentage.

Tax Credits

Physicians should be offered a one-time tax credit for the year in which they adopt an approved health information technology. Eprescribing is just one possible qualifying technology. Electronic medical records, personal health records, remote patient monitoring and electronic disease management programs are also candidates for a tax credit. However, approved technologies should be defined as those that result in decreased

healthcare costs. Provide a tax break for consumers who adopt a PHR such as Medic Alert, eHealthKey. Approved technologies may reduce costs through improved care quality and the avoidance of medical errors or acute or long-term care admissions.

Targeted Efforts to Drive Pharmacist Adoption

The Pennsylvania Medical Society plans to reach out to pharmacies in cooperation with the Pennsylvania Pharmacists Association as part of its ConnectTheDocs project to increase adoption of broadband by Pennsylvania pharmacies.

In addition to hardware, software, connectivity and transaction costs, pharmacies will need to handle changes to workflow. While a goal of eprescribing is an improvement of workflow for the pharmacy, eprescribing may initially be a hardship to pharmacy workflow. Design changes may need to be made to handle the changes. Assistance with these changes can be found through pharmacy software vendor contacts and the Pennsylvania Pharmacists Association. Pharmacists experienced with this change in workflow are often willing to explain their experiences in order to assist other pharmacists in avoiding the same problems.

As an incentive to adopt eprescribing, pharmacies should be granted a tax credit for the first full tax year in which they accept electronic prescriptions. Acceptance of electronic prescriptions would be defined as actively receiving bi-directional, computer-to-computer electronic prescriptions. Use of pharmacy software that is capable of such transactions alone would not qualify a pharmacy for this tax credit. Qualified pharmacies must be able to verify through transaction logs and other means that they have electronically accepted compliant electronic prescriptions from physicians.

Targeted Efforts to Increase Patient Safety Benefits of ePrescribing

The Pennsylvania eHealth Initiative (PAeHI) has had several meetings with a broad range of electronic prescribing stakeholders. As discussed, physicians report that interaction alerts in many eprescribing systems are too sensitive. Frustrated physicians frequently ignore the alerts or disengage them entirely. Several electronic prescribing vendors expressed an interest in working collaboratively with the Pennsylvania eHealth Initiative to develop a more uniform and appropriate interaction alert system. Such reforms will engender physicians' trust of interaction alerts, thereby potentially avoiding life-threatening interactions.

Developing a system that would permit the equivalent exchange of medication information between PBMs, pharmacies, hospitals, and physicians needs to be examined. Although the solution will require a complex interface, this crosswalk is essential to providing physicians and other providers with a complete, accurate and current medication list.

There are numerous initiatives and incentives, which can drive future adoption of electronic prescribing. Economic incentives can include grants and loan programs, reimbursement for utilization, pay-for-performance programs, reductions in malpractice insurance premiums and group discounts from healthcare IT suppliers. Policy incentives and programs can include: accreditation programs such as JCAHO 2005 Hospitals' National Patient Safety Goals; employer programs such as Leapfrog and others; and Medicare support for economic incentives, DOQ-IT and CCHIT certification of inpatient and ambulatory EHRs.

MMA-eprescribing program and its impact on Pennsylvania
Eprescribing, likely to increase significantly with the expansion of Medicare Part D plan providing prescription drug coverage for Medicare beneficiaries. Basic eprescribing may be considered an entry into EHRs and can serve as a platform for adding advanced features such as alerts, and when implemented as an interoperable first phase of a more comprehensive EHR.

PA House Bill 1683
House Bill 1683, which was introduced by Rep. Eddie Day Pashinski (D-Luzerne), is aimed primarily at healthcare facilities and not private or group physician practices.
It would require facilities to provide all medical staff with prescriptive authority access to an eprescribing system that can identify drug interactions. When applying for a license, facilities would be required to certify that they provide access to such a system.
The bill would establish guidelines for physicians who choose to use eprescribing and require physicians to certify that they have access to a system and report whether it is being used for writing prescriptions.

While the intention is to move quickly to engage physicians in utilizing health information technology, carrots (incentives) tend to motivate long-term sustainable behavior changes than sticks (mandates). Transforming a practice using EHR and eprescribing solutions requires significant process change and payment reform that creates a sustainable business case for quality and care management. Consideration must also be given to allowing enough time to resolve technology issues within the practice or health system. Some organizations face potential incompatibility among different information systems that require integration work in order to resolve conflicts and allow for information to move seamlessly.

Finally of major concern are the legal and ethical issues related to the security of patient privacy and confidentiality. Ethical, legal and technology issues linked to the accuracy, security, confidentiality and access rights will need to be resolved or the consequences may be more detrimental than the current issues we're trying to solve. These considerations need to be thoughtfully taken into consideration before moving too quickly toward an approach that includes mandates versus gentle persuasion by educating and demonstrating the true value that EHR, eprescribing and health information exchange offer with adoption and utilization.

P4P: Pay for Performance
Across the nation, many P4P programs directly incentivize investment in health information technology, though P4P payments are not fully subsidizing the cost of implementing full-scale health information technology (HIT) capabilities.

Highmark provides financial support to primary care physicians as one technology focused component of its QualityBLUE^{SM}, Physician Pay for Performance Program. A physician may earn incentive dollars upon demonstrating their purchase, implementation and integration of eprescribing or EHR technologies into their daily practice operations.

Stark Laws
The relaxation of the Stark legislation rules governing hospital investment in physician EHRs may encourage hospitals to consider building relationships with community physicians in investing in HIT and in developing new models of care coordination across locations.

PARTNERSHIPS FOR SUCCESS

Public-Private Collaboration

On a national level, numerous efforts to accelerate the adoption of health information technology have been underway in both the public and private sectors. The federal government is providing a good deal of leadership and coordination through the Office of the National Coordinator for Health Information Technology (ONC). ONC was established within the Department of Health and Human Services (DHHS) in 2004 in order to facilitate the development and nationwide implementation of an interoperable health information technology infrastructure within the next 10 years (DHHS, 2005a). ONC and other federal entities are working in close collaboration with numerous private-sector partners to move forward this agenda. Another significant development was the leadership shown by state and federal officials who prioritized eprescribing as part of their health policy agendas.

In the past year, Pennsylvania, along with Arizona, California, Florida, Illinois, Minnesota and New Hampshire are participating with state government offices and the state department of health to initiate planning for health information exchange. Many other states issued executive orders or introduced health information technology legislation to encourage electronic prescribing as a way to improve patient safety and prescribing efficiency.

At the federal level, CMS provided significant funding to state Medicaid programs – more than $100 million – for them to get involved in driving the use of eprescribing. Under the leadership of Secretary Mike Leavitt, HHS adopted regulations that will eliminate the "fax exemption" from the Medicare Modernization Act (MMA) guidelines and would require all electronic prescriptions related to the Part D Program to comply with the NCPDP Script Standard. The proposed rule establishes a deadline for the elimination of computer-generated faxes by Jan. 1, 2009. The current administration's budget includes funding to the Agency for Healthcare Research and Quality (AHRQ) for IT Demonstration Projects. One of the stated missions of AHRQ is to advance the use of information technology for coordinating patient care and conducting quality and outcomes research.

The Centers for Medicare and Medicaid Services (CMS) has taken a leadership position in improving the quality and efficiency of healthcare through IT. For example, it has strongly supported the adoption of data standards within the federal government through the Consolidated Health Informatics Initiative. The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 recognizes the critical role that IT has in improving healthcare outcomes and reducing medical errors within the Medicare program. And, of course, CMS plays an active advisory and regulatory role in the implementation of the HIPAA Transactions and Code Sets (TCS) standards.

The HIPAA TCS standards must be recognized as a huge step forward in the evolution of the EHR. Once fully implemented, standardized transactions and code sets will serve as a major cornerstone of the EHR.

Many of our country's legislators actively promote accelerating the adoption of EHR and eprescribing as evidenced by their aggressive platforms. Former Speaker of the House Newt Gingrich openly talks about the need for changes in healthcare such as e-prescribing, electronic health records and an electronically connected healthcare structure. With his

theme "Paper Kills" he creates a sense of urgency to transform our delivery of healthcare now!

Solving the connectivity challenges
Locally **PennTAP** supports technology-based economic development by helping
Pennsylvania companies improve competitiveness by providing a limited amount of free
technology assistance to help resolve specific technical needs.

ConnectTheDocs, a Pennsylvania Medical Society project funded by the Commonwealth of
Pennsylvania through a Broadband Outreach and Aggregation Fund (BOAF) grant from the
Department of Community & Economic Development is also focused on providing the
means for physicians and other health care professionals to interact with one another and
share information across a network securely, efficiently and effectively. The project will
expand broadband network technologies to physician practices in which broadband is not
currently used or available and improve healthcare in Pennsylvania, especially in rural
areas. For physicians who already use broadband in their practice, this project could
potentially offer higher quality broadband access or lower rates. The project will create
quality-of-care benefits to thousands of patients and enhance the world-class health care
Pennsylvania's physicians deliver to their patients every day. This initiative will yield a more
rapid adoption of broadband services by Pennsylvania's physicians.

A 2006 survey by the Pennsylvania Medical Society showed that 9 percent of Pennsylvania
physicians have no Internet access or dial-up access in their practices. Another 28 percent
have expensive T-1 lines that have insufficient bandwidth for functions such as telemedicine
and transferring digital images. In short, at least 37 percent of Pennsylvania's physicians—
about 11,000—lack high-speed Internet access in their offices. Even in practices that have
broadband, access is often limited to a single PC that may not be accessible in areas where
direct patient treatment occurs. With the $300,000 provided through **Broadband Outreach
and Aggregation Fund** the Medical Society begins leading a statewide project advocating
the use of broadband network technologies to improve healthcare in Pennsylvania,
especially in rural and underserved areas. Pennsylvania has an estimated 30,000 actively
practicing physicians.

Federal Communications Commission has provided for grants to increase broadband
connectivity and six grantees in Pennsylvania have been deemed eligible for the next round
of monies, which include more than $400 million in funding.

To significantly increase access to acute, primary and preventive healthcare in rural
America, the Federal Communications Commission has dedicated over $417 million for the
construction of 69 statewide or regional broadband telehealth networks in 42 states and
three U.S. territories under the Rural Health Care Pilot Program (RHCPP). The
Commission's RHCPP will support the connection of more than 6,000 public and non-profit
health care providers nationwide to broadband telehealth networks. The healthcare facilities
participating in the pilot from Pennsylvania include:

- Geisinger Health System
- Juniata Valley Network
- Northwestern Pennsylvania Telemedicine Initiative
- Penn State Milton S. Hershey Medical Center
- Pennsylvania Mountains Healthcare Alliance
- Northeast HealthNet (PA, NY)

Senate Bill 300 focuses on funding technology that exists to support a system of digital
medical records that would substantially reduce administrative costs while also reducing

medical errors and duplicative treatments or diagnostic procedures caused by unavailable or unreadable records and orders.

Adoption and implementation of uniform standards (data standards & business rules)
Clinical Document Architecture for Common Document Types (CDA4CDT) is an organization driving the HL7 balloting process and adoption of documentation standards for the purposes of EHR interoperability. The reality of the inpatient medical record today is upwards of 60 percent of the documentation necessary for the treatment and reimbursement of a patient visit is completed in an unstructured, narrative format with minimal standardization within a typical facility, let alone across facilities in the state of Pennsylvania.

CDA4CDT received HL7 approval for identifying standard formatting on History and Physical and Consultation reports in the inpatient setting in October 2007. Operative Report documents will be ready for ballot by mid-2008. By adopting these standards, facilities will be able to provide the same report structure, transforming a narrative account of a patient's visit into XML-based data elements, which can be displayed in a common format within the EHR. Likewise, this format would be interoperable via HL7 to EHR initiatives across Pennsylvania.

Adoption Incentive

- Increased funding and support for physicians to help them buy and implement systems.
- Increased reimbursement for physicians to help compensate for the added economic burden of the extra time needed to handle the information provided from electronic prescribing.
- Funding of physician champions and other leaders to act as examples to their peers. Also funding of implementation teams to help evaluate and assist medical practices and pharmacies with adoption.
- Non-economic incentives or mandates for payers to push them to fund electronic prescribing efforts with the requirement that they support projects that include all regional payers, physicians and patient populations.
- Use EHRs to replace current public health reporting burdens on healthcare providers such as immunizations and communicable disease registries.

Educational campaigns are in high demand that increase awareness for physicians, pharmacists and the public around the issues of using technology to improve patient safety and drive efficiencies.

Conclusion

Patients are also more empowered control and improve their health with access to health information in the form of personal health records (PHR) which is an electronic tool that enables individuals to control personal health information, supports the management of health and well being and improves communication between their health care providers. Just as with EHRs, there are many flavors of PHR systems. Establishing a future where there is a seamless flow of information from an individual's PHR to his or her provider's EHR and back will truly transform healthcare delivery impacting behaviors and outcomes.

The use of EHRs and eprescribing has emerged, as a solution to the industry's challenge in accessing clinical information from numerous disconnected clinical databases at the time the information is needed. It is clear that a key requirement for success in the adoption of health information technologies and health information exchange is the active involvement of clinicians. A further measure of success is the degree to which healthcare clinicians use the information available to impact the delivery of care.

The widespread adoption and use of electronic health records and electronic prescribing results in a win-win strategy for patients, physicians, healthcare providers, pharmacists and payers, working together in partnership to ensure a safer, more efficient and cost effective healthcare delivery environment for all.

RECOMMENDATIONS & FUTURE CONSIDERATIONS

The mission of establishing a widespread adoption and use of electronic health records and electronic prescribing is to support healthcare stakeholders in improving patient safety, reducing medication and medical errors, increasing efficiency and reducing the cost of health care for all Americans. This paper has presented current thinking around the promotion of adopting these electronic applications with proven benefits to all stakeholders as well as describing some of the barriers that need to be overcome before a critical mass is achieved. Pennsylvania eHealth Initiative (PAeHI) stands ready to move the adoption of EHRs and electronic prescribing in concert with the following recommendations:

General Recommendations

- Break down the barriers (i.e. technical, cultural, geographic, legal, regulatory, financial) to the widespread adoption of electronic medical records.

- Encourage the rapid adoption of electronic prescribing. We believe that in order to achieve the full benefits of patient safety goals, eprescribing must ultimately be part of a comprehensive, integrated electronic health record system. Efforts to encourage standalone eprescribing should be clearly focused on using this as an interim step.

Specific Recommendations

- Deploy adoption incentives such as tax credits, grants and loan programs to assist health care providers in the initial installation of EHR and eprescribing solutions;

- Use incentives such as pay-for-performance programs, reductions in malpractice insurance premiums and group discounts from healthcare IT suppliers should be put in place to help reduce and underwrite the ongoing operating cost of these systems;

- Support policy incentives and programs that include accreditation programs, such as JCAHO 2005 Hospitals' National Patient Safety Goals, employer programs such as Leapfrog and others and Medicare support for economic incentives;

- Advancement of, and adherence to a single set of national health IT, privacy and security standards and policies such as CCHIT certification of inpatient and ambulatory EHRs;

- Access to broadband connectivity should not be seen as an initial barrier to the adoption of EHR and eprescribing, however to facilitate the sharing of information across entities increase broadband availability and choice in order to increase access to clinical health information exchange and to drive down related communication costs;

- Support is needed for all levels of health information exchange; from the grassroots local efforts to the larger statewide initiatives. Therefore funding of health information networks that promote the exchange of information across all key stakeholder groups should be encouraged. Furthermore, efforts to fund health information networks should concentrate on viable and sustainable models.

Pennsylvania should participate and lead efforts (NHIN, etc) on a national level of health information exchange;

- Employ non-economic incentives or regulatory policy incentives for organizations to encourage the funding of electronic prescribing efforts with the requirement that they support projects that include all regional payers, physicians and patient populations. Encouraging transparency and public access to quality based report-cards may act as a non-economic incentive that helps to promote adoption and utilization;

- Allow for the use EHRs to replace current public health reporting burdens on health care providers such as immunizations and communicable disease registries. Reporting requirements should not mandate the use of proprietary standards but rather be capable of assimilating data in various formats to encourage use; and

- Educate physicians, pharmacists and the public around the issues of using technology to improve patient safety and drive efficiencies, particularly to those entities in rural areas where the need for interoperability improves communication.

Future Directions

- Recognize the growing role of personal health records (PHR), the demand from consumers to play a significant role in where, who and how information is exchanged. Ongoing successful use and growth of PHRs is dependent on widespread adoption of EHR use and adherence to a set of uniform data transaction standards to ensure meaningful data sharing.

- Understand the increasing complexity and demand for privacy and security issues.

- Develop a strategy for distributed-wide decision support. The ability to access and analyze additional clinical information from various data sources, adds value to physician decision-making at the point of care.

- Plan for interoperability between disparate systems.

- Explore other key stakeholders that may contribute to a financially sustainable model.

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GLOSSARY

Adverse Drug Events (ADE)
In pharmacology, any unexpected or dangerous reaction to a drug. An unwanted effect caused by the administration of a drug. The onset of the adverse reaction may be sudden or develop over time.

Broadband
A medium that can carry multiple signals or channels of information at the same time without interference. Broadband Internet connections enable high-resolution videoconferencing and other applications that require rapid, synchronous exchange of data.

Centers for Medicare and Medicaid Services (CMS)
The government agency within the Department of Health and Human Services that directs the Medicare and Medicaid programs (Titles XVIII and XIX of the Social Security Act), and conducts research in support of these programs.

Certification Commission for Healthcare Information Technology (CCHIT): The Certification Commission for Healthcare Information Technology or CCHIT is a recognized certification body (RCB) for electronic health records and their networks, and an independent, voluntary, private-sector initiative. It is our mission is to accelerate the adoption of health information technology by creating an efficient, credible and sustainable certification program. See www.cchit.org

Computerized Physician Order Entry (CPOE)
Refers to computer-based systems that automate and standardize the clinical ordering process in order to eliminate illegible, incomplete and confusing orders. CPOE systems typically require physicians to enter information into predefined fields by typing or making selections from on-screen menus. CPOE systems often incorporate, or integrate with, decision support systems.

Confidentiality
The property the data or information is not made available or disclosed to unauthorized persons or purposes.

Consumer
A person who purchases or received goods or services for personal needs and not for resale.

Decision Support
A computer program that analyzes data and presents the information so that clinicians can make medical decisions more easily. Typical tasks of a decision support system include data storage, data analysis, predictive modeling, and risk-adjusted comparison of actual outcomes with predicted outcomes.

Drug Benefits
A prescription drug coverage that is offered under a policy, contract or health plan or payer.

Electronic Health Record (EHR)
Electronically stored information about an individual's health history, treatments, and other related information held by a health care provider.

Electronic Medical Record (EMR)
A computer-based patient medical record. An EMR facilitates access of patient data by clinical staff at any given location; accurate and complete claims processing by insurance companies; building automated checks for drug and allergy interactions; clinical notes; prescriptions; scheduling; sending to and viewing by labs

Electronic Prescribing (eprescribing)
The practice in which drug prescriptions are entered into an automated data entry system (handheld, PC, or other), rather than handwriting them on paper. The prescriptions can then be printed for the patient or sent to a pharmacy via the Internet or other network.

Evidence-based medicine
Evidence-based medicine is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of an individual. This approach should be balanced with the best external evidence along with the desires of the patient and the clinical expertise of the health care professional.

Formulary
The list of prescription drugs for which a particular employer or payer organization will pay. Formularies are either "closed," including only certain drugs or "open," including all drugs. Both types of formularies typically impose a cost scale requiring consumers to pay more for certain brands or types of drugs.

Health Information Exchange (HIE)
An infrastructure to enable movement of healthcare information electronically across organizations within a region or community. It must also have agreed-upon business relationships and processes to facilitate information sharing across organizational boundaries

Health Information Technology (HIT)
The use of computer software and hardware to process healthcare information electronically, thereby allowing for storage, retrieval, sharing and use of the information.

Health Insurance Portability and Accountability Act (HIPAA)
This 1996 act provides protections for consumers in group health insurance plans. HIPAA prevents health plans from excluding health coverage of pre-existing conditions and discriminating on the basis of health status (Department of Labor, 2002).

Information system (IS)
An interconnected set of information resources under the same direct management control that shares common functionality. A system normally includes hardware, software, information, data, applications, communications and people.

Interoperability
HIMSS' definition of interoperability is "ability of health information systems to work together within and across organizational boundaries in order to advance the effective delivery of healthcare for individuals and communities.

ONC (Office of the National Coordinator):   Is a government agency (part of HHS) that oversees and encourages the development of a national, interoperable (compatible) health information technology system to improve the quality and efficiency of health care. See www.hhs.gov/healthit/

Pennsylvania Technical Assistance Program (PennTAP)
PennTAP supports technology-based economic development by helping Pennsylvania companies improve competitiveness by providing a limited amount of free technology assistance to help resolve specific technical needs.

Personal Health Record (PHR)
Electronically stored information similar to electronic health records but often maintained by an individual and limited to information on the individual's health conditions and treatment history.

Prior Authorization
The approval a provider must obtain from an insurer or other entity before furnishing certain health services, particularly inpatient hospital care, in order for the service to be covered under the plan.

Pharmacy Benefit Manager (PBM)
PBMs are third party administrators of prescription drug benefits.

Privacy
The right of an individual to live free of intrusive monitoring of their personal affairs by third parties not of their choosing and to provide consent for access to that information.

Regional Health Information Organization (RHIO)
A neutral organization that adheres to a defined governance structure and like an HIE, facilitates collaboration and coordinates activities to provide the privacy, security, and public trust required to support the exchange of individuals' health information.

Security
   Ability to ensure that information is neither modified nor disclosed except in accordance to the security policy.

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An experienced healthcare strategist, Chelle Woolley has served in many of the industry's most innovative and leading organizations promoting the use of health information technology for improving the way care is delivered in this country. Chelle is currently the principal consultant for Woolley & Associates, an independent consulting organization focused on building company image, branding and messaging. Ms. Woolley creates effective positioning that enables an organization to develop competitive strategy and a message platform in support of that position, thus influencing business profitability.

Prior to establishing her consulting company, Ms. Woolley was the Senior Vice President and Communications Officer for RxHub, the nationwide electronic prescription drug information exchange. Ms. Woolley has more than twenty years of leadership/management experience in the health care industry. Chelle co-founded and served as Senior Vice President of ICAN, Inc, an Internet web site focused on providing information related to infectious disease and infection control topics.   Ms. Woolley was responsible for developing corporate strategy resulting in $5 million in venture financing and managing all operational aspects of the Company including sales, marketing, account management, client services and corporate communications. Ms. Woolley was also a Vice President and co-founder of Abaton.com, developer of web-based physician connectivity services and applications—responsible for sales, marketing and positioning. Prior to these start-up enterprises, Ms Woolley spent over 13 years in leadership positions at United HealthCare Corporation.

Ms. Woolley received a Masters of Science and Masters of Public Health from the University of Minnesota, School of Public Health. She was an Assistant Professor at Towson State University of Maryland in the Health Sciences Division and continues to present and educate at national health care conferences.

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