



*Connecting Pennsylvanians for
Better Health:*
**Recommendations from the
Pennsylvania eHealth Initiative**

**Approved by
PAeHI Board of Directors
April 25, 2007**

Pennsylvania eHealth Initiative
www.paehi.org

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EXECUTIVE SUMMARY

Connecting Pennsylvanians for Better Health: Recommendations from the Pennsylvania eHealth Initiative

The goal of *Connecting Pennsylvanians for Better Health* is to facilitate the effective use of technology through electronic health records (EHRs), electronic patient health records (PHRs), and local information exchanges (HIEs) to meet patients' needs for safer, more effective, more affordable, more personalized healthcare. The following key issues must be addressed to connect Pennsylvanians for better health:

- Patient privacy and confidentiality
- Care Transformation/Process Excellence
- Interoperability of health information technology (HIT) applications
- Common statewide HIE infrastructure
- Clinical-decision support

The Pennsylvania eHealth Initiative (PAeHI) was created in 2005 as a voluntary public-private non-profit coalition to bring together Pennsylvania's healthcare and business stakeholders to develop a vision and a plan for the future of health information technology and exchange in Pennsylvania. To aid in the *Connecting Pennsylvanians for Better Health* development process, specific guiding principles were endorsed and provided the foundation for a long-term strategy:

Guiding Principle 1: Patients come first.

Guiding Principle 2: Consumer privacy, security and confidentiality are paramount.

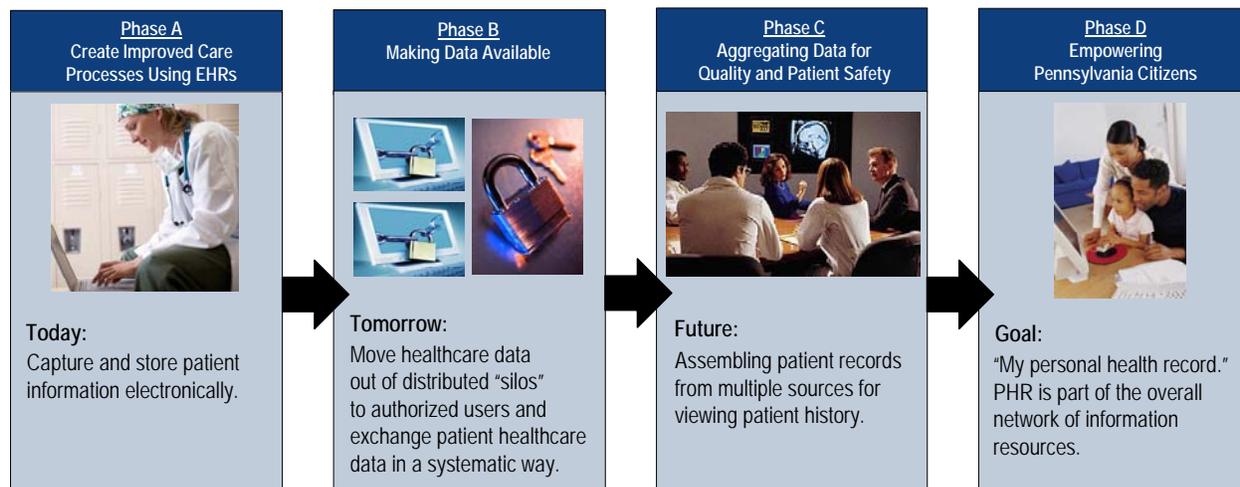
Guiding Principle 3: Multi-stakeholder collaboration is needed to implement achievable and measurable initiatives in order to show early progress and value.

PAeHI has identified the following key foundational roles that it will serve to connect Pennsylvanians for better health:

1. Identify opportunities for Pennsylvanians to use health IT and HIE to improve healthcare.
2. Educate the public providers and policy makers regarding the benefits and challenges of health IT and HIE.
3. Assist in the coordination of health IT efforts among Pennsylvania healthcare stakeholders.
4. Identify opportunities to coordinate with and benefit from federal initiatives.
5. Develop statewide consensus on established and emerging standards (e.g., data, communication and reporting).
6. Work with providers, payers, policy makers to define business cases (including return on investment) for health IT and HIE.

This report details key building blocks to enhance patient care and is designed to provide an overall view of the development of health information exchange in Pennsylvania. It is focused primarily on the incremental development of local healthcare information exchanges to create the basis for statewide connectivity. Diagram A depicts this phased approach to creating electronic aggregate health records for Pennsylvanians.

Diagram A: Evolution of the Electronic Aggregate Health Record



This report also offers recommendations for how the public and private sectors can exert critical leadership in this process and insight into the legislative and regulatory landscape.

In recent years there has been a significant increase in the amount of activity at the national, state and local levels to create a more interconnected, electronic healthcare system. Increasingly, decisions regarding the scope and the direction of health IT and HIE initiatives will be made at the local level where healthcare is delivered. However, state-level coordination is required and should be focused on those functions that add clear value when performed at the state level. Recommended functions that can be implemented at the state level to support the PAeHI mission and Pennsylvania's local HIE initiatives include the following:

- Legal Interpretation and Consensus
- Semantic Interoperability and Technical Support
- Statewide Coordination
- Fundraising and Administration of Statewide Funding
- Education and Marketing

The Commonwealth, along with foundational local efforts, can play an important role in transforming the way that healthcare is delivered to patients in Pennsylvania. It is important to note that *Connecting Pennsylvanians for Better Health* provides a blueprint and a set of recommended strategies to foster HIE. For the goals outlined to be achieved, however, leadership at all levels is required in order to continue this dialogue and facilitate the activities needed in Pennsylvania to create an interconnected healthcare system.

Conclusion

There is an expansion of Pennsylvania HIT and HIE initiatives currently in operation or in varied stages of development. Now is the time to act to ensure these initiatives are coordinated across the state and do not develop into “islands of information.” This report has been designed to capture and provide an overall view of health information exchange in Pennsylvania, focused primarily on the development of healthcare information exchange to create the basis for statewide connectivity. *Connecting Pennsylvanians for Better Health* delivers a unified consensus-driven strategy for future development of HIEs and incorporates the discussions, recommendations and admonitions of the PAeHI governance, committees and participants. Additionally, this report promotes an incremental approach for building a strong foundation upon which leadership in the Commonwealth of Pennsylvania can transform healthcare.

In order to maintain the momentum established over the past two years and to implement *Connecting Pennsylvanians for Better Health*, there are immediate activities that should be performed. First and foremost is the establishment of dedicated staff and resources to support PAeHI. Other immediate actions that can then be performed by PAeHI include:

- Development of a marketing and education plan for *Connecting Pennsylvanians for Better Health*
- Creation of a consumer brochure providing information about *Connecting Pennsylvanians for Better Health* and HIE
- Development of resource guides and tools for local HIEs
- Form a task force to study existing Pennsylvania state laws (e.g., privacy, security, medical records, etc.) and make recommendations on needed changes to encourage the widespread adoption of EHRs
- Coordination with the Commonwealth to develop a Request for Proposal process for local HIE funding

Connecting Pennsylvanians for Better Health provides the structure and tools to implement the recommendations and deliver success. Success can be defined many ways; however, it can be summarized as the long-term tangible improvements in healthcare quality, safety, and costs through focused, collaborative incremental efforts. Achieving success will be possible with the collaborative contributions and efforts of many Pennsylvania public and private partners, each with a sense of urgency and commitment to advance health information exchange.

I. INTRODUCTION

In Governor Edward G. Rendell's 2007 "Prescription for Pennsylvania", the need for extending health information technology was highlighted:

"Electronic health records are known to reduce errors by making patient information more complete and available to healthcare providers in a more timely manner, so quicker and more accurate decisions can be made...The Chronic Care Model must include...tracking clinical information of individual patients and a population of patients to help guide the course of treatment, anticipate problems and track problems..."

By Executive Order, Governor Rendell has indicated he will establish a Health Technology Commission to complete the following by December 31, 2007:

- Establish standards and specifications for personal health records and electronic medical records that ensure necessary interoperability.
- Define components and terminology.
- Recommend financial and financing incentives for healthcare providers to purchase these systems.

In the Pennsylvania General Assembly, Senator Rob Wonderling (R-Montgomery) introduced Senate Bill 8, which creates the Medical Safety Automation Fund to provide matching grants to healthcare providers and local health information organizations to implement electronic health systems that improve healthcare quality, reduce medical errors, and advance the delivery of patient-centered medical care.

Connecting Pennsylvanians for Better Health

To accomplish the *Connecting Pennsylvanians for Better Health*, the Pennsylvania eHealth Initiative (PAeHI) has been the neutral forum for the many diverse interests in the health IT community to rally around a common mission, which is "to improve patient care through the effective use of health information technology." PAeHI has grown over the past year from 40 founding stakeholders to more than 240 participants representing more than 160 different healthcare organizations — including government, insurers, hospitals, physician practices, Medicare Quality Improvement Organizations, healthcare member associations and vendors. PAeHI draws on the rich health IT resources and experiences that already exist in Pennsylvania and across the country to more effectively learn from one another and to thoughtfully build on that in which we have already invested.

After two years of organizing, studying the Pennsylvania health information technology landscape, watching and informing the state and national providers and policy makers relative to health information exchange, the PAeHI Board is committed to developing a clear articulation of a PAeHI strategy (the *Connecting Pennsylvanians for Better Health*) that identifies the healthcare needs of Pennsylvania; current barriers to meeting those needs; and identification of

health information technologies that could be encouraged and/or provided through the PAeHI public-private partnership to help overcome those barriers.

PAeHI has identified the following roles it will play to connect Pennsylvanians for better health:

1. Identify opportunities for Pennsylvanians to use health IT and HIE to improve healthcare.
2. Educate the public providers and policy makers regarding the benefits and challenges of health IT and HIE.
3. Assist in the coordination of health IT efforts among Pennsylvania healthcare stakeholders.
4. Identify opportunities to coordinate with and benefit from federal initiatives.
5. Develop statewide consensus on established and emerging standards (e.g., data, communication and reporting).
6. Work with providers, payers, policy makers to define business cases (including return on investment) for health IT and HIE.

These issues and roles are addressed in detail throughout the *Connecting Pennsylvanians for Better Health* report.

PAeHI *Connecting Pennsylvanians for Better Health* Guiding Principles

To aid in the *Connecting Pennsylvanians for Better Health* development process, specific guiding principles were endorsed and provided the foundation for a long-term strategy:

Guiding Principle 1: Patients come first.

Healthcare must be re-designed to better serve individual patients and entire populations first and foremost.

Guiding Principle 2: Consumer privacy, security and confidentiality are paramount.

Without consumer trust and acceptance of the process, no matter how well the system or network is designed and executed, it will fail. While there is public support for health information exchange, it is also recognized that Pennsylvania citizens have a strong concern for the privacy and security of their medical health records.

Guiding Principle 3: Multi-stakeholder collaboration is needed to implement achievable and measurable initiatives in order to show early progress and value.

Cooperation and collaboration on the implementation of Health Information Exchange will drive innovation and change within local HIE efforts as well as across the various stakeholders in the state. It is on this front in a local healthcare market where the average citizen will see the greatest administrative relief and impact. Multi-stakeholder involvement is needed to ensure the patient's health information is robust and to foster the sustainability and financial solvency of local HIE efforts.

Why a Local Focus?

The trend of statewide efforts to create an interconnected, electronic healthcare system has been driven by enhancing healthcare quality and effectiveness and reducing the cost of healthcare. Today, state leaders are recognizing that health IT and 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. Since the early application of information systems in healthcare (some 40 years ago), where the hospital was the primary repository for most clinical information, much has changed. Now the vast majority of clinical information and patient encounter data reside in fragmented silos based on where healthcare delivery occurs, such as the physician office or hospital.

Patients tend to seek care locally. Therefore, a local focus is needed. Solving the problems inherent in the transition to interoperable interconnected electronic health information requires the development of ever increasing trust and further collaboration in order to move through the stages of the electronic medical record and HIE evolution. Thus, the focus of the *Connecting Pennsylvanians for Better Health* was the design a strategy to encourage, facilitate, incent and organize local health information exchanges to:

- Deliver clinical data to any care provider the patient designates.
- Aggregate and organize clinical data to inform physicians and other caregivers about the patient's complete history and treatment, thereby enhancing quality and patient safety.
- Empower patients to manage their healthcare data through personal health records for quality improvement and care management.

Connecting Pennsylvanians for Better Health Recommendations

The Strategic Planning Committee and PAeHI Committees determined various recommendations that have local and statewide impact. The *Connecting Pennsylvanians for Better Health* report discusses these recommendations in the following two sections:

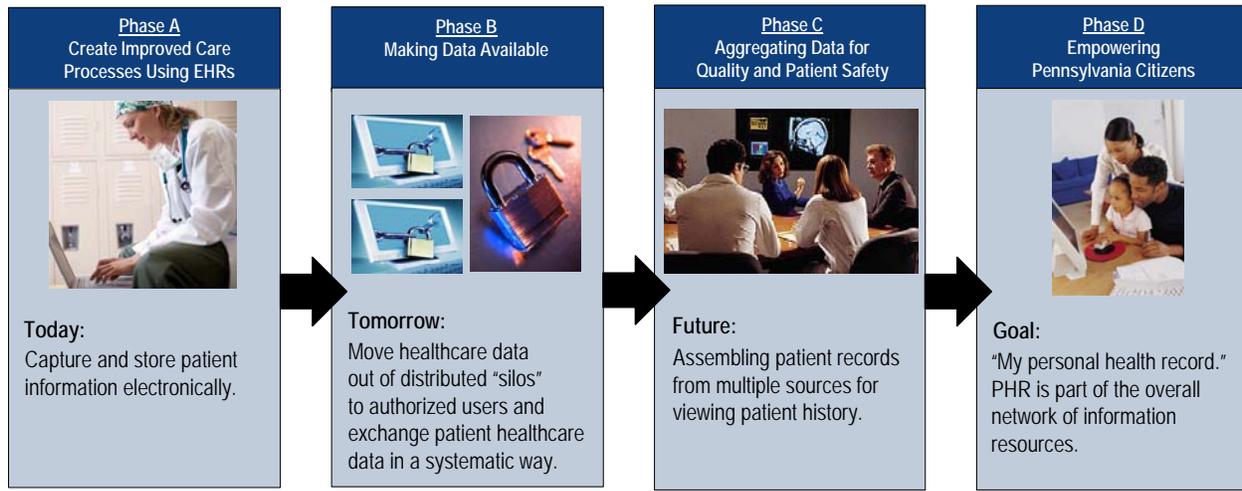
1. Evolution of electronic health records (including portable patient health records)
2. Role of Pennsylvania government

Evolution of the Electronic Health Record

This incremental process is outlined in Diagram A. It will need to take special account of the resource needs of rural and underserved areas.

An essential characteristic of the *Connecting Pennsylvanians for Better Health* recommendations is their focus on the need of patients for safer, more effective, more affordable, more personalized care processes. *Connecting Pennsylvanians for Better Health* is designed to harness electronic record systems, EHRs and PHRs, to meet that need.

Diagram A: Evolution of the Electronic Aggregate Health Record



Phase A: Create Improved Care Processes Using EHRs

Many healthcare providers are generally at this phase today. They are in various stages of moving from paper medical records towards capturing and storing patient clinical information electronically. Providers should be encouraged to move towards implementing standards-based electronic health records.

Phase B: Making Patient Data Available

This "Tomorrow" phase involves freeing clinical data from silos by creating secure, robust information delivery pipelines. Moving from paper to electronic transactions to facilitate the delivery, completeness, security, privacy, reliability, timeliness of information delivery, and implement other value-added services to patients, physicians and other care givers. In short, technologically improving today's complex, fragmented, poorly functioning information delivery systems in preparation for Phase C.

Phase C: Aggregating Each Patient's Data for Care, Quality and Patient Safety

Assembling an electronic clinical data summary of each patient from across many sources of care, for use by their clinicians and other authorized caregivers to facilitate and improve real-time clinical decision-making.

Phase D: Empowering Pennsylvania Citizens

Mobilizing patients' clinical data to other tools and systems patients choose in order to improve patient-clinician collaboration (e.g., Personal Health Record Systems, disease and chronic care management programs, drug interactions, mental health facilities, and research programs).

Privacy and Security

In any phase, one of the greatest potential barriers to the electronic sharing of clinical information is the difficulty in establishing privacy and security credibility with the public and participating stakeholders. Because of the nature of patient data, and the potentially devastating

consequences of an inappropriate disclosure, security and privacy concerns must be met in order to achieve success. This report focuses on:

- Creating a documented consensus based on a legal framework regarding all security and privacy requirements and recommended approaches.
- Working with lawmakers to develop legislation that provides clear direction for the use of electronic clinical data and define clear penalties for misuse of clinical data.
- Educating providers and consumers on this new process and their rights regarding the use of clinical information.

As HIE implementations grow across Pennsylvania, the Commonwealth of Pennsylvania's government will have specific roles in health information exchange. Those roles will mature as each initiative delineates specific process and products of their HIE. More detailed legal issues need to be addressed. Additionally, Pennsylvania has been participating with other states in a federally funded project to complete the Health Information Security and Privacy Collaboration (HISPC) work. The HISPC project's main task is to identify barriers and solutions to security and privacy of health information exchange. These findings will be beneficial in supporting HIE efforts in Pennsylvania as the recommendations are implemented.

A variety of federal and state statutes and regulations affect the formation of any Health Information Exchange in Pennsylvania. Implementation of *Connecting Pennsylvanians for Better Health* requires that consistent and meticulous legal interpretation of laws that are applicable to health IT and HIE be performed to ensure long-term success. These can include federal and state laws on electronic medical record confidentiality and privacy, security, consumer rights, electronic medication prescribing, fraud, abuse, and antitrust. The resolution of many of the legal challenges depends greatly on how a Health Information Exchange is structured, the types of healthcare information being exchanged, the types of participants in the exchange, and the purposes for which the exchange is accessed by the participants.

Role of Pennsylvania Government

In recent years there has been a significant increase in the amount of activity at the national, state and local levels to create a more interconnected, electronic healthcare system. Increasingly, decisions regarding the scope and the direction of health IT and HIE initiatives will be made at the local level where healthcare is delivered. However, state-level coordination is required and should be focused on those functions that add clear value when performed at the state level. Recommended functions that can be implemented at the state level to support the PAeHI mission and Pennsylvania's local HIE initiatives include the following:

Legal Interpretation and Consensus

- Reduce legal and regulatory barriers for the sharing of electronic health data.
- Ensure adequate protection of consumers against privacy and security breaches.
- Facilitate statewide consensus of legal opinion.

Semantic Interoperability and Technical Support

- Advocate for the use of national standards (e.g., for interoperability).
- Provide a forum for input to national standard setting bodies.
- Promote the development of statewide master patient and provider indices and a record locator service (RLS).
- Identify and assist with developing health IT and HIE solutions for medically underserved areas, technology challenged areas or areas falling between naturally occurring local HIEs.

Statewide Coordination

- Increase collaboration with PAeHI.
- Leverage PAeHI governance and committee structure for health IT and HIT advisory needs.
- Provide resources to PAeHI.
- Encourage local HIEs to move toward the exchange and interoperability of clinical data.
- Conduct statewide medical trading area analysis.

Fundraising and Administration of Statewide Funding

- Set criteria and align incentives for HIE recognition, support, and funding.

Education and Marketing

- Encourage collaboration and communication amongst stakeholders regarding *Connecting Pennsylvanians for Better Health*.

The Commonwealth, along with foundational local efforts, can play an important role in transforming the way that healthcare is delivered to patients in Pennsylvania. It is important to note that *Connecting Pennsylvanians for Better Health* provides a blueprint and a set of recommended strategies to foster HIE. For the goals outlined to be achieved, however, leadership at all levels is required in order to continue this dialogue and facilitate the activities needed in Pennsylvania to create an interconnected healthcare system.

II. PENNSYLVANIA eHEALTH INITIATIVE BACKGROUND

The Pennsylvania eHealth Initiative (PAeHI) was created to encourage the development and use of electronic medical records (EMRs) in Pennsylvania along with health information exchanges (HIEs), which will ultimately integrate into a national system allowing patients and healthcare providers to securely access medical records locally and throughout the country. The initiative works with providers, health insurers, businesses, and government to inform healthcare stakeholders and all Pennsylvanians of the benefits of utilizing electronic health records; interconnect all healthcare stakeholders to make health information available; address legal and policy issues that could impede the development of HIEs; enable secure, confidential access to health information; and enable patient access and control of their health information.

Interested stakeholders (40 healthcare-related organizations) first met in March 2005 to explore the need for a statewide organization to help enable the use of information technology in improving healthcare quality and efficiency and ensuring safety for all patients. A series of organizational meetings followed, along with a statewide Health Information Technology Summit in Harrisburg in July 2005. The stakeholders adopted bylaws in September 2005 and became incorporated as a non-profit organization in Pennsylvania that same month. In the fall of 2005, The Hospital & Healthsystem Association of Pennsylvania, the Pennsylvania Medical Society and Quality Insights of Pennsylvania representatives facilitated the election of the Initiative's first Board of Directors.

PAeHI Leadership

The activities of the Pennsylvania eHealth Initiative are directed, and to a large extent carried out, by a dedicated and experienced all-volunteer Board of Directors. The Board is largely made up of directors who are elected by, and from within, the various membership classes of the Initiative. Three directors represent Quality Insights of Pennsylvania, the Pennsylvania Medical Society and The Hospital & Healthsystem Association of Pennsylvania (HAP). Additionally, two directors are appointed by the Governor of Pennsylvania to represent the Commonwealth.

2007 PAeHI Board Members:

Martin J. Ciccocioppo (Chairman), Vice President, Research, HAP

Mark J. Jacobs (Vice Chairman), Director, Information Technology, WellSpan Health

Dan Jones (Secretary), Chief Operating Officer, Quality Insights of Pennsylvania

Tom Tabor (Treasurer), Senior Vice President and CIO, Highmark Inc.

Kenneth D. Coburn, M.D., President, CEO & CMO, Health Quality Partners

F. Wilson Jackson III, M.D., Owner, Jackson Gastroenterology

Darlene M. Kauffman, Associate Director, Payor Relations, Pennsylvania Medical Society

Don Levick, M.D., Physician Liaison Information Services and President Medical Staff, Lehigh Valley Hospital

Teresa Shuchart, Chief Information Officer, Pennsylvania Department of Public Welfare

Jay Sрни, VP, Emerging Technology, HIMSS, University of Pittsburgh Medical Center

Anthony Wilson, Special Assistant to the Sec. of Health, Pennsylvania Department of Health

Ex Officio Members:

Roger F. Mecum, Executive Director, Pennsylvania Medical Society

James M. Walker, M.D., Chief Medical Informatics Officer, Geisinger Health System

Donald F. Wilson, M.D., Medical Director, Quality Insights of Pennsylvania

Throughout 2006, the PAeHI held face-to-face monthly Board meetings. Minutes of the Board meetings are posted on the organization's website, www.paehi.org, in the "Members" area. Four of the Board meetings featured special guest presentations (including: InterComponentWare; Accenture; Tolven Healthcare Innovations; and First Consulting Group FirstGateways and InstantDX) regarding electronic medical records and health information exchange professionals and a dialog between the presenters and the Board. The audio recordings and slides from each of these presentations are posted on the public side of the Initiative's website.

Standing Committees

By January 2006, the Board created and chartered four standing committees with goals and first-year objectives. The four PAeHI committees are:

- Business Analysis and Technology Committee
- Communication and Education Committee
- Membership Committee
- Finance Committee

The committees were charged with moving the Initiative closer to achieving its mission of improving healthcare quality, patient safety, accessibility, care coordination and disease surveillance through the effective application of health information technologies and stakeholder communication. The Board appointed leadership for each of the committees and adopted charters (**Appendix A**) for each of the standing committees. Three quarterly face-to-face all-committee meetings were held to better enable the achievement of each committee's first-year deliverables. In addition to the quarterly all-committee meetings, the standing committees and their subcommittees communicated through dedicated listserves, conference calls and face-to-face meetings.

Participation Explodes

In early February 2006, the Board announced that the Initiative was ready to begin accepting volunteers for membership in each of the standing committees. Committee membership was opened to individuals or representatives of organizations (both initial stakeholders and other interested organizations) dedicated to the mission and purpose of the Pennsylvania eHealth Initiative. Within two months, participation in the Initiative exploded as volunteers signed on to help the various committees.

Regional and National Involvement

Representatives of PAeHI participated in both state and national HIE forums throughout the year. PAeHI formally affiliated with the Healthcare Information and Management Systems Society (HIMSS) Regional Health Information Organization (RHIO) Federation in late 2005 and is now a member of the national eHealth Initiative and the joint eHI/HIMSS Connecting Communities project, into which the RHIO Federation has merged. In addition to various

communications with the broad PAeHI membership throughout the year, the Initiative formally launched the quarterly PAeHI News electronic newsletter in October 2006.

First, all groups felt strongly that any innovation in the healthcare system must be driven by quality improvements and should be patient-centered as opposed to driven by efficiency or cost reduction. Second, each group found that the Commonwealth of Pennsylvania government must be an integral partner with PAeHI in convening stakeholders to facilitate and coordinate activity.

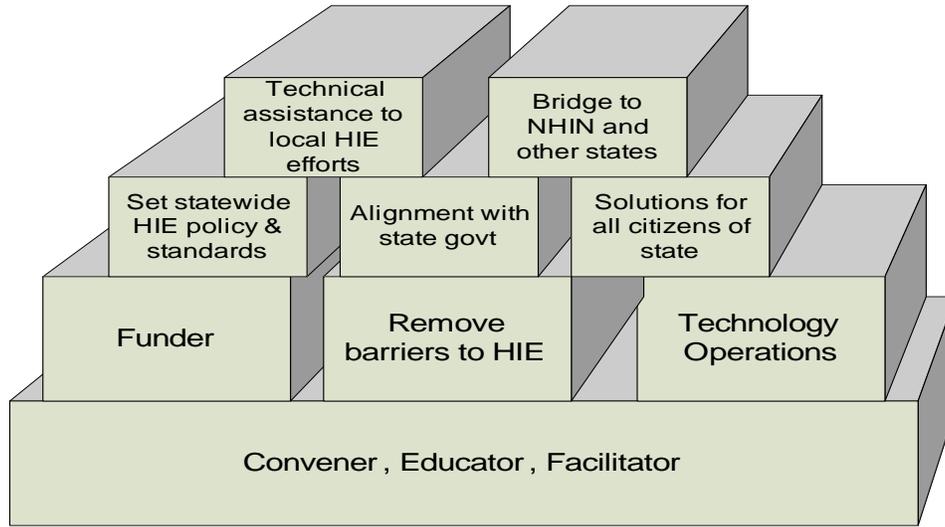
Strategic Planning Committee

In late-2006, the PAeHI Board created a Strategic Planning Committee composed of the Board, committee leaders and key Pennsylvania stakeholder representatives. The PAeHI Strategic Planning Committee was charged with reviewing issues surrounding the creation of an e-health infrastructure in Pennsylvania and to develop guidance for the users of such infrastructure. There were 28 members seated on the Strategic Planning Committee. Members of the Strategic Planning Committee are listed in **Appendix B**. The Strategic Planning Committee included membership from a diverse and comprehensive representation of Pennsylvania healthcare stakeholders. The Strategic Planning Committee built on the 2006 work of the four PAeHI standing committees and was informed by a PAeHI Member Priorities Survey conducted in January 2007.

The Committee was charged by the Board with creating a three-year leadership plan for enabling the connection of many disparate healthcare data sources throughout Pennsylvania to ensure that relevant patient data is available to authorized caregivers and other stakeholders to provide high quality efficient healthcare. The Committee participated in a full-day facilitated retreat to develop a consolidated course of action for PAeHI. The *Connecting Pennsylvanians for Better Health* concept was born out of the PAeHI Strategic Planning retreat recognition that enabling the documentation of an individual's complete, lifelong health and medical history into a private, secure and standardized format that he or she owns and controls, but yet is accessible to legitimate providers day or night from any location is the end game that we are all striving towards. However, achieving the *Connecting Pennsylvanians for Better Health* can only be achieved through an incremental approach of encouraging the use of standards-based electronic medical record systems, facilitating the exchange of clinical data among unrelated stakeholder and diverse systems, and then capturing patient health information for access and control by patients.

The following diagram depicts the many building blocks/issues that support health information exchange and ultimately must be addressed in order to achieve the *Connecting Pennsylvanians for Better Health*.

Diagram B: Building Blocks to Support Health Information Exchange



Source: State Level Health Information Exchange Initiative Development Workbook: A Guide to Key Issues, Options and Strategies, Foundation of Research and Education of AHIMA, 2006.

III. STATE OF HEALTH INFORMATION TECHNOLOGY AND HEALTH INFORMATION EXCHANGE IN PENNSYLVANIA

Health Information Technology and Health Information Exchange

This report makes a distinction between health information technology (HIT) and health information exchange (HIE). The recommendations listed clarify the affiliation between the various components and analyze the approaches necessary for implementation. Health information technology is the use of computer software and hardware to process healthcare information electronically, thereby allowing for the storage, retrieval, sharing and use of the information, data and knowledge for communication and decision making related to healthcare delivery. The main function of HIT resides within physician offices, laboratories, hospitals, mental health centers or large hospital systems. Electronic medical record (EMR) systems, administrative systems (e.g., registration and billing) and clinical information systems (e.g., clinical documentation and computerized physician order entry) are examples of HIT systems.

Health information exchange is 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. HIE provides the capability to electronically move clinical information between disparate healthcare information systems while maintaining the meaning of the information being exchanged. The goal of HIE is to facilitate access to and retrieval of clinical data to provide safe, timely, efficient, effective, equitable, patient-centered care. HIE services facilitate a one to many connection between clinical service providers and clinicians/patients instead of the many to many connection existing today. A central website, healthcare terminology translation tools, a Master Patient Index (MPI), authentication and authorization infrastructure, and applications to aggregate information from multiple sources are examples of HIE resources.

The Difference Between HIE and HIT

HIE consists of communicating across multiple organizations in a region, the state, and between regions, hospitals and physician offices. HIT is the support infrastructure that enforces HIE, provides information movement in a healthcare organization and makes each document readable and informative. Electronic Medical Records and e-Prescribing tools, both health IT, are two of the most referenced tools that will change healthcare.

Electronic Medical Records

Electronic medical records (EMRs) are an important part of the overall vision of the *Connecting Pennsylvanians for Better Health*. An EMR is an electronic record containing information about a patient with the ability to communicate with other applications within a health enterprise (hospital, clinic, physician practice). EMRs are very important to healthcare as they can provide cost savings as well as improve the efficiency and safety of healthcare. Healthcare technology can provide alerts and reminders to the clinician warning of possible injury or missed opportunities for prevention. They can also enable continuous 24/7 access to records as well as simultaneous access to a single record by multiple users. Additionally, they can reduce the cost of record management over time, when compared to paper records.

An EMR is only as useful as the clinical information it contains, and the task of getting information into an EMR is still daunting. Information is constantly arriving at the physician's office from the many different clinical service providers involved with a patient's care (laboratories, pharmacies, imaging centers, mental health centers, therapists and, of course, the patient and his or her caregivers). Information about medications, tests and procedures performed by other providers is also needed for clinical decision-making.

In today's marketplace, the lack of standardization causes hand-transcription, scanning paper-based documents into the EMR and other practices that do not facilitate a holistic view of the patient or enable automated alerts and reminders. Another solution is to create different interfaces for each EMR, in order to import data from every provider, which rapidly becomes cost-prohibitive. Thus, electronic health information exchange actually becomes a prerequisite for the cost-effective implementation and full benefit of EMRs in many, if not most, physician practice settings. It is therefore impractical to wait to initiate clinical information exchange pending the widespread installation of EMRs.

On the other hand, much information of value that might flow through health information exchanges could potentially originate from EMRs. In order for this to occur most efficiently, the EMRs should be standards-based and equipped in an interoperable fashion. The implementation of non-standardized EMRs in this fashion complicates, rather than aids, the development of effective information exchange. For this reason, EMR implementations should only be encouraged and incentivized if they meet minimum interoperability standards, including Certification Commission on Health Information Technology (CCHIT) certified products, and those meeting PAeHI interoperability standards as well.

Electronic Prescribing (e-Prescribing)

Many have proposed e-Prescribing, referring to the electronic transmission of prescriptions, with the possible addition of a variety of other applications, as a promising early implementation of electronic information exchange. Indeed, the potential to reduce transcription errors, improve formulary-based prescribing, detect drug-drug and drug-allergy interactions, reduce the costs of paper transactions and records are all important goals of the *Connecting Pennsylvanians for Better Health*.

With e-Prescribing implementation, the information produced should be structured to enhance the continuum view of the patient through HIE. If they are developed in silos within disparate healthcare systems, this would be problematic. Therefore, the technology used by clinicians and clinical service providers should allow integration of the information. Specifically, e-Prescribing decision-support should incorporate information from other sources and standards for user-identity, patient-identity, data transmission and vocabulary. The vocabulary used in e-Prescribing should be the same as vocabulary used in HIE. If this does not occur, new impediments to exchange and new obstacles to efficient workflow will be created. As described in the Healthcare Industry Laws and Regulations section, in addition to the above challenges, changes in federal law will be required to fully implement e-Prescribing.

Current State – Pennsylvania HIT and HIE Activity

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

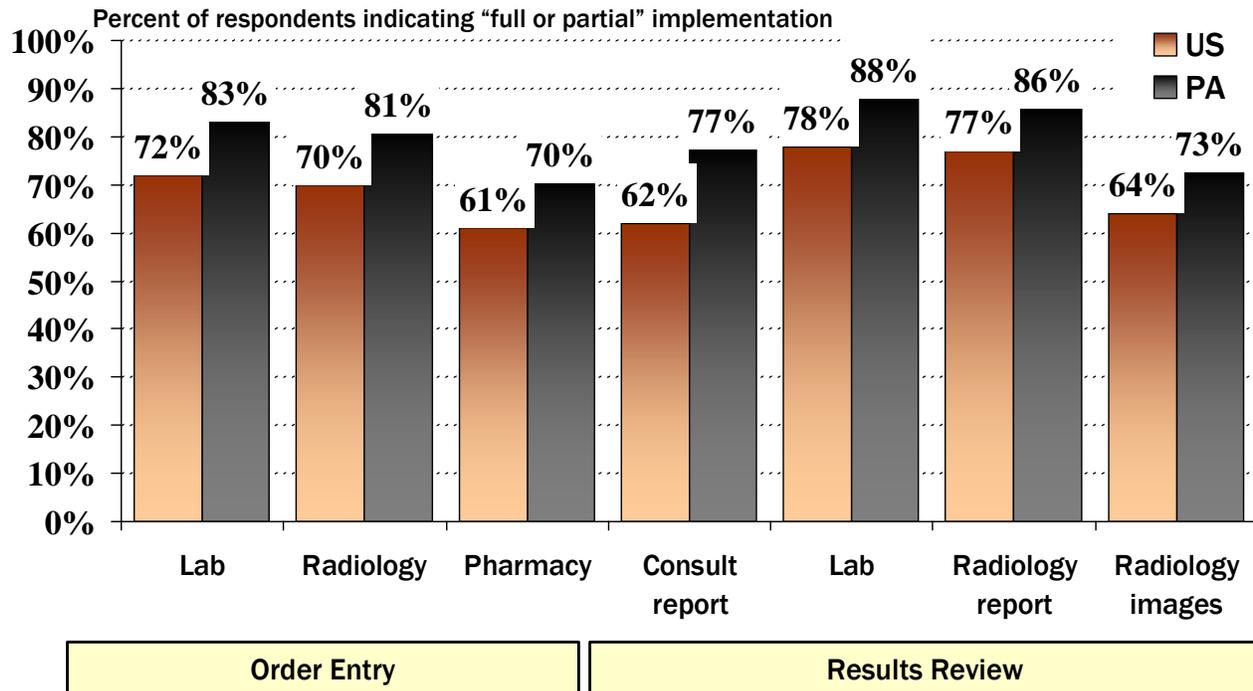
Pennsylvania also has unique strengths and experiences that can be built upon to help ensure success:

- Vision, Leadership, Landmark Policy and Program Alignment
- Critical Mass of Stakeholders
- National Caliber IT Capabilities and Foundation of Experience

The state continues to provide vision, leadership and direction on health IT—telemedicine, vital records, immunization registry, disease surveillance, Medical Assistance management, pharmaceutical pricing and others. **Appendix C** contains HIT-related provisions of Governor Rendell’s Prescription for Pennsylvania.

According to the findings of a Fall 2006 American Hospital Association Health Information Technology Survey, Pennsylvania’s hospitals and health systems are outpacing hospitals nationally in their adoption and use of clinical health IT systems.

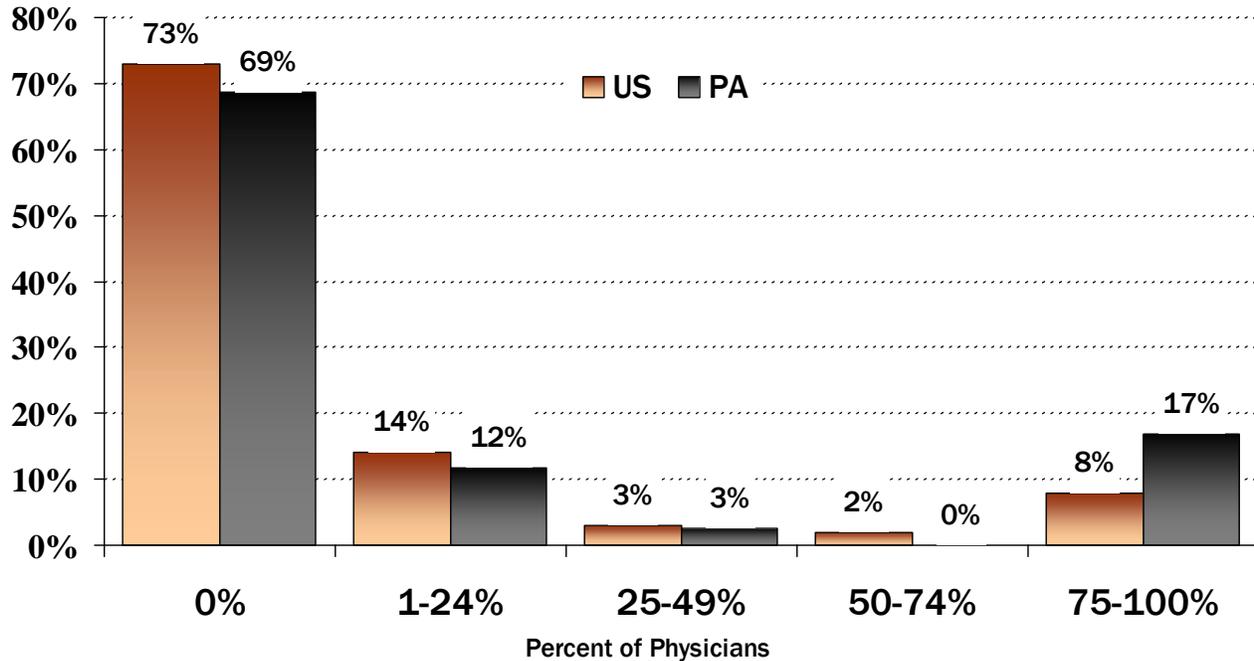
Diagram C: Percent of United States and Pennsylvania Hospitals and Health Systems Using Various Electronic Order Entry and Results Review Functions



Source: HAP analysis of AHA HIT Survey, December 2006

According to The Hospital & Healthsystem Association of Pennsylvania’s analysis of the AHA HIT Survey, Pennsylvania is also outpacing most states in adopting computerized forms of physician order entry.

Diagram D: Percent of United States and Pennsylvania Hospitals Reporting the Proportion of their Medical Staff that Routinely Order Medications Electronically



Source: HAP analysis of AHA HIT Survey, December 2006

According to AHA’s “Continued Progress: Hospital Use of Information Technology,” 2007:

The data show continued progress in health IT adoption in hospitals, but we remain far from the goal of universal adoption. The patterns displayed in the survey data suggest that certain kinds of hospitals—generally those with greater financial resources—are gaining ground faster than others. Accelerating adoption among all kinds of hospitals will require a shared investment between providers, payers, and purchasers. Hospitals currently bear almost all the costs of IT investment, with no increase in payment for the use of these new technologies. However, many of the financial benefits of IT—such as decreased need for repeat tests, lower readmission rates, and shorter lengths of stay—accrue to those who pay for care.

When looking at how to finance health IT adoption, policymakers should give special attention to hospitals with less stable finances, smaller hospitals and rural hospitals. Other barriers to IT use, such as lack of systems that share data easily, challenges in managing work process changes, and lack of trained IT staff also must be addressed by policymakers and the hospital field.

Pennsylvania's HIE Initiatives

According to the 2006 AHA HIT Survey, nearly half of Pennsylvania's hospitals reported sharing electronic patient-specific health information with local or regional partners. In 2006, the PAeHI Business Analysis and Technology Committee surveyed health information exchange initiatives in various stages of development across Pennsylvania. The following is a partial listing of HIE initiatives in Pennsylvania:

- Central Pennsylvania Health Information Collaborative
- Philadelphia Health Information Exchange
- DuBois Regional Health Information Organization
- Susquehanna Valley Rural Health Partnership
- Southern Allegheny Health Resource Alliance
- University of Pittsburgh Medical Center
- Pittsburgh Health Information Network
- Mercy Circle of Care Exchange Model
- Northeast Pennsylvania Regional Health Information Organization
- Real Time Outbreak and Disease Surveillance (RODS) – Syndromic Surveillance
- PA National Electronic Disease Surveillance System (PA-NEDSS)
- Statewide Immunization Information System (SIIS) – Immunization Registry
- Pennsylvania eHealth Initiative
- Central Pennsylvania Alliance Laboratory (CPAL)

Appendix D contains a more detailed inventory of many clinical HIE projects underway in Pennsylvania. There likely additional clinical HIE initiatives across the Commonwealth that the BAT Committee did not survey and PAeHI leadership was not aware of in Spring 2006. Surveys were conducted online with telephonic interviews with HIEs that didn't complete the online survey. The purpose of the survey was to gather information on the status of these initiatives as well as to discover what a statewide effort could do to assist them in their endeavors. Information gathered was considered by the Strategic Planning Committee and aided in making decisions regarding recommendations for the *Connecting Pennsylvanians for Better Health* report. Also, the **PAeHI Member Priorities Survey** conducted in January 2007 was designed to gain understanding of the expectations that PAeHI stakeholders had for a statewide effort and how it could facilitate their efforts. A summary of the responses to PAeHI's RHIO survey can be found in **Appendix E** and a summary of the findings from the PAeHI member priorities survey can be found in **Appendix F**.

Through the HIE survey, the PAeHI Member Priorities Survey and the strategic planning retreat, it became clear that there is not only interest around the state to develop such exchanges, but also that there is an understanding of a necessary statewide role. Besides funding support, the initiatives listed other specific support needed statewide:

- Provide standards/guidelines for exchange of information within and between local HIE activities.
- Provide a "starter guide" (e.g., reference guide/tool kit) for local HIE initiatives.
- Act as an umbrella to connect local initiatives.

- Identify and facilitate the availability of subject matter experts to assist with planning and helping local efforts get started.
- Provide recommendations on key legal issues relevant to data sharing.
- Foster the promotion and adoption of standards.
- Facilitate the development of a statewide master patient index.

HIE Stages

Local health information exchanges have been classified, in an annual survey, by eHealth Initiative into stages showing their progress in the HIE evolution. Listed below are the definitions used by eHealth Initiative for each stage. A majority of the initiatives in Pennsylvania are in the first three stages of HIE development.

Stage 1: Described as the recognition of the need for HIE among multiple stakeholders in the region.

Stage 2: Getting organized. In this stage local initiatives are defining their shared visions, goals and objectives. They are identifying funding sources and setting up legal and governance structures.

Stage 3: In this stage initiatives are transferring vision, goals and objectives to tactics and business plan. They are defining the needs and requirements and securing funding.

Stage 4: Well under way with the implementation of the health information exchange. This includes technical, legal and financial aspects.

Stage 5: In this stage the local HIE is fully operational. They are transmitting data that is being used by healthcare stakeholders. A sustainable business model has been established.

Stage 6: In this stage the local HIE is demonstrating the expansion of the organization to encompass a broader coalition of stakeholders than present in the initial operational model.

Connecting Pennsylvanians for Better Health

The trend of statewide HIE efforts is to closely integrate local initiatives with the statewide HIE initiative. Large and complex states like Pennsylvania are not starting with a statewide HIE approach; therefore, a local emphasis is a critical aspect of any Pennsylvania HIE approach. The number of stakeholders that are needed to participate in order to gain a critical mass, are far too numerous at a state level. However, it has been seen that by working within regions (or Medical Trading Areas [MTAs] as they are referred to in this document) there is a greater impact and success rate. (See **Appendix G** for an overview of the MTA concept.) Therefore a decision was made to view Pennsylvania as being made up of multiple local HIE initiatives that may have different architectures and capabilities. A statewide organization will be necessary to facilitate the exchange of data between the local HIEs.

Local HIEs need to develop trust and a framework for collaboration among the stakeholders before they can evolve to higher levels of data sharing and sustainability. From the workgroup discussions, it became apparent that an incremental approach to building HIEs and electronic health records for patients would be needed. This type of incremental approach allows the HIE to show early progress, value, create momentum and to focus on mid-term and long-term activities prioritized by criteria such as urgency and feasibility. Thus, the focus of the *Connecting Pennsylvanians for Better Health* is the development of recommendations to encourage, facilitate, incent and organize health information exchange at the local and the statewide level, to provide the services needed to support local HIEs (e.g., gain economies of scale, provide funding) and remove barriers for the local HIEs that individually they can not overcome.

The PAeHI Mission and Purpose statements help to provide important focus while implementing many of the recommendations of *Connecting Pennsylvanians for Better Health*.

PAeHI Mission

The mission of PAeHI is to:

- a) Enable the use of information technology to improve healthcare quality and efficiency and ensure patient safety for all Pennsylvanians.
- b) Ensure secure, confidential access to health information to enable individuals and communities to make the best possible health decisions.

PAeHI Purpose

The purposes for which PAeHI is formed are as follows:

- a) To encourage and promote, through the collective efforts of its members, an environment in Pennsylvania which will:
 1. Inform healthcare stakeholders and all Pennsylvanians of the benefits of utilizing electronic health records to reduce medical errors, avoid duplicative work and enable clinicians to focus their efforts more directly on improved patient care.
 2. Interconnect all healthcare stakeholders to make health information available for the benefit of consumers wherever they need it.
 3. Personalize care through the utilization of consumer-centric information to enable consumers to manage their health and assist with personal healthcare decisions.
 4. Protect the public through the collection of anonymous, timely and standardized clinical information.
- b) Establish a process for identifying and adopting statewide interoperability standards consistent with national standards.
- c) To serve as the statewide source for objective, accurate information about health information technology.
- d) To participate in studies, surveys and research projects consistent with our mission.
- e) To secure needed funding for initiative activities from grants, payers, vendors, foundations and other organizations.
- f) To create an open forum for participants in locally sponsored initiatives to make others aware of their activities and to share their successes and barriers.

- g) To create a neutral forum for healthcare stakeholders to meet and address common needs and potential solutions.
- h) Facilitate and encourage the effective use of HIE data to analyze and trend measures of quality, efficiency, and patient safety in order to continually improve care for all Pennsylvanians.

The specific mission for the Strategic Planning Committee was to articulate a path to develop a health information network connecting the Commonwealth of Pennsylvania with an infrastructure and governance model for long-term sustainability through public-private partnerships. *Connecting Pennsylvanians for Better Health* is the work product from this process.

Healthcare Industry Laws and Regulations Impacting Health Information Organizations

All PAeHI stakeholders understand the importance of laws and regulations in the healthcare industry, especially in protecting patients' rights. Therefore, the *Connecting Pennsylvanians for Better Health* specifically reviewed those laws and regulations that impact health information organizations and the sharing of information. The laws discussed below are those which are likely to have the most extensive and pervasive impact on HIE, however, this list is not exhaustive.

Working within a highly regulated industry, healthcare providers and health-related information are subject to a myriad of laws at both the state and the federal level. "Law" includes both statutes passed by Congress or the General Assembly, regulations adopted by governmental agencies as promulgated pursuant to statute and court rulings (common law). Laws that impact HIE include:

A. Privacy and Confidentiality Laws. Federal, state and common law create minimum protections regarding the privacy and confidentiality of identifiable health and personal information in electronic, written, verbal, and any other form. These include the federal privacy regulations under the Health Insurance Portability and Accountability Act (HIPAA), federal alcohol and other drug confidentiality regulations, and Pennsylvania's Health and Safety and Public Welfare Codes. These laws establish patients' rights regarding access to their health information. Patients' rights include the right to inspect and obtain copies of their own health information, to request restrictions on disclosure of health information, seek amendments for inaccuracies, and obtain an accounting of certain disclosures.

B. Security Laws. Federal security regulations under HIPAA, although technology neutral, require implementation of appropriate security safeguards to protect certain electronic healthcare information that may be at risk while permitting appropriate access, availability and integrity and use of that information. Covered entities must conduct an assessment of the potential risks and vulnerabilities to the confidentiality, integrity, and availability of electronic protected health information held by the entity. Also, they must implement sufficient administrative, physical, and technical safeguards (considering their size, funding and ability) to protect information that the covered entity creates, receives, maintains, or transmits. The regulations contain standards for each type of safeguard and implementation specifications for each standard.

The requirements in the security regulations are designed to be technology neutral to accommodate changes in technology. This flexibility also allows clinical service providers to choose technologies to best meet their specific needs, taking into account size, capabilities, the costs of the specific security measures, and the operational impact. This means that specific security measures adopted by clinical service providers may comply with the security regulations yet impede interoperability and health information exchange.

C. Healthcare Fraud and Abuse Laws. These laws are intended to prevent fraud and abuse by regulating the relationships between physicians and other healthcare entities.

1. **Physician Self-Referral (Stark Laws).** The federal Stark Law prohibits a physician from making referrals for certain “designated health services” payable by Medicare to an entity with which the physician has a financial relationship, unless an exception applies. The law also prohibits the entity from submitting claims to Medicare or anyone else for Medicare designated health services that are furnished as a result of a prohibited referral. The Stark Law is enforced by the Centers for Medicare & Medicaid Services (CMS). Violations of the statute are punishable by denial of payment for all designated health services claims, refund of amounts collected for designated health services claims, and civil monetary penalties for knowing violations of the prohibition.
2. **Anti-kickback Laws.** The federal anti-kickback statute provides criminal penalties for individuals or entities that knowingly and willfully offer, pay, solicit, or receive remuneration in order to induce or reward the referral of business reimbursable under any of the federal healthcare programs. Remuneration may be direct or indirect. Prohibited conduct includes not only the payment of remuneration intended to induce or reward referrals of patients, but also the payment of remuneration intended to induce or reward the purchasing, leasing, or ordering of, or arranging for or recommending the purchasing, leasing, or ordering of, any good, facility, service, or item reimbursable by any federal healthcare program. Violations of the anti-kickback statute may also result in the imposition of civil money penalties, exclusion from federal health programs, and liability under the False Claims Act.

The U.S. Department of Health and Human Services, Office of Inspector General (OIG) enforces the federal anti-kickback statute. Congress required that OIG adopt regulations providing “safe harbors” to limit the reach of the statute somewhat by permitting certain non-abusive arrangements, while encouraging beneficial or innocuous arrangements. These “safe harbor” provisions 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 healthcare programs.

Implications under Stark and anti-kickback provisions are similar. For example, a hospital may provide equipment, services or other incentives to participating physicians to participate in an HIE. Stark and anti-kickback laws may be triggered if the physician then refers a patient to the hospital that has provided these technologies. Thus, the Stark

and anti-kickback laws must be considered in structuring an HIE, providing incentives and benefits to participating physicians to minimize liability.

CMS recently adopted an “exception” from Stark for certain electronic prescribing and electronic health records arrangements. Likewise, 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>. This exception (safe harbor) as well as other exceptions (safe harbors), need to be evaluated to choose the most advantageous structure, while minimizing risk for violations.

D. Antitrust. Federal antitrust laws include the Sherman Antitrust Act, the Clayton Act and the Federal Trade Commission Act. These laws are intended to promote competition, prohibit collusion and regulate other business practices that unfairly reduce competition. Generally, clinical service providers are competitors in the marketplace. Thus, when competitors join together in a cooperative venture, such as an HIE, questions may arise regarding activities that unfairly control development or access to HIE technology or contractual terms that exclude certain providers from participating. Thus these laws must be considered in structuring an HIE and defining terms of participation.

E. Federal Tax Laws. Parties that join together to form an HIE may include one or more tax-exempt entities. Tax-exempt organizations are prohibited from providing improper financial or other benefits to a private individual or entity. Since HIE contemplates the interchange of information between tax-exempt entities and private or for-profit entities, these laws must be addressed in structuring an HIE and defining terms of participation.

F. Intellectual Property. "Intellectual property" is a product of the intellect that has commercial value, such as trademarks, patents, copyrights, and trade secrets. Legal concerns will need to be addressed in developing an HIE including the ownership of the system that electronically transmits health information and its components. Software licensing and ownership issues will need to be resolved regarding each element and process that make up the HIE (e.g., data formats, data layouts, interfaces, security measures, process to standardize data, creation of an aggregate health record, record locator system, etc.) Additionally, in connecting to the HIE, and building interoperability with their current systems, clinical service providers may encounter legal issues related to current software licensing agreements. These will also need to be resolved.

G. Laws Regulating Prescribing Practices. Prescribing practices are highly regulated to ensure appropriate use and distribution of controlled and non-controlled substances. Controlled substances are regulated at the federal level by the Food and Drug Administration (FDA) and the Drug Enforcement Administration (DEA) and at the state level by the Pharmacy Board. DEA regulations require that prescriptions for controlled substances be hand-signed. The DEA is currently developing standards to permit electronic transmission of prescriptions for controlled substances (see Electronic Prescriptions for Controlled Substances, Anticipated Standard for DEA Electronic Transmission of Prescriptions for Controlled Substances System, available at http://www.deadiversion.usdoj.gov/ecomm/e_rx/e_standard.htm) and anticipates that any system that meets technological, security and audit standards described at the website listed above may

be used to process electronic prescriptions. However, the standards are not yet final. According to the DEA this electronic system is in addition to and not a replacement of the existing paper-based prescription system.

It should be noted that consideration of federal HIT legislation came into focus during the 109th Congress (2005-2006) but to date, no far-reaching bill has been enacted. On a vote of 270 to 148, on July 27, 2006, the U.S. House of Representatives passed the Better Health Information System Act (HR 4157), following the Senate's passage of a similar bill in November 2005. Efforts to conference H.R. 4157 and Senate-passed S. 1418 legislation to resolve differences were not successful and therefore no unified bill was formulated before the November 2006 Congressional elections. House Resolution 4157 (Better Health Information System Act) would have addressed: upfront funding to Promote HIT; safe harbors – antikickback safeharbor for provision of hit and training services; standards and interoperability; privacy and security; and the role of government in HIT and HIE.

IV. GUIDING PRINCIPLES

The context of the recommendations within the *Connecting Pennsylvanians for Better Health* are based on the following core principles, which the PAeHI Strategic Planning Committee widely viewed as the building blocks for a statewide health information exchange.

Guiding Principle 1: Patients come first.

Healthcare must be redesigned to better serve individual patients and entire populations first and foremost. HIT and HIE should be viewed as enablers of healthcare redesign aimed at improving the delivery of healthcare services and the health of Pennsylvanians. This can be accomplished by ensuring healthcare providers have all appropriate clinical information (i.e., patient's health record, protocols, etc.) available at the point of care. Harnessing the benefits of digitized healthcare information will allow researchers and public health officials to improve the effectiveness of healthcare and to monitor disease outbreaks early and deploy effective interventions.

Guiding Principle 2: Consumer privacy, security and confidentiality are paramount.

Without consumer trust and acceptance of the process, no matter how well the system or network is designed and executed, it will fail. While there is public support for health information exchange, it is also recognized that Pennsylvania citizens have a strong concern for the privacy and security of their medical health records.

The goal of *Connecting Pennsylvanians for Better Health* is for a healthcare environment in which Pennsylvanians will be able to give their pharmacist, their doctor, or the emergency room immediate access to their information, but patients will control who sees their information and what it is used for. PAeHI believes that ultimately consumers must be in control of their health information and as we move to support sustainable HIE efforts, legal compliance and patient health information protections must be a central focus. The *Connecting Pennsylvanians for Better Health* is based on the premise that, with any improvement to Pennsylvania's healthcare system, privacy and security of health information must be maintained in compliance with local, state and federal statutes.

Pennsylvania's healthcare stakeholders agree with this mission and during the two-year history of PAeHI, a patient-centered and collaborative approach to health information technology was a common vision shared throughout a diverse set of stakeholders. PAeHI participants agree that quality benefits and maintaining appropriate access to personal health data is essential to facilitating health IT initiatives. Further, PAeHI's stakeholders support the need for patient privacy in the use of personal health data.

Throughout each phase of PAeHI's efforts to help build health information exchanges, the standard of consumer privacy, security and confidentiality will be paramount within the limits imposed by law. The *Connecting Pennsylvanians for Better Health* promotes the development of technology, policy and legal solutions that allow for the greatest

patient control, access and ownership to personal health information as well as effective security and privacy assurances.

Guiding Principle 3: Multi-stakeholder collaboration is needed to implement achievable and measurable initiatives in order to show early progress and value.

Cooperation and collaboration on the implementation of Health Information Exchange will drive innovation and change within local HIE efforts as well as across the various stakeholders in the state. It is on this front in a local healthcare market where the average citizen will see the greatest administrative relief and impact. Multi-stakeholder involvement is needed to ensure the patient's health information is robust and to foster the sustainability and financial solvency of local HIE efforts.

V. RECOMMENDATIONS

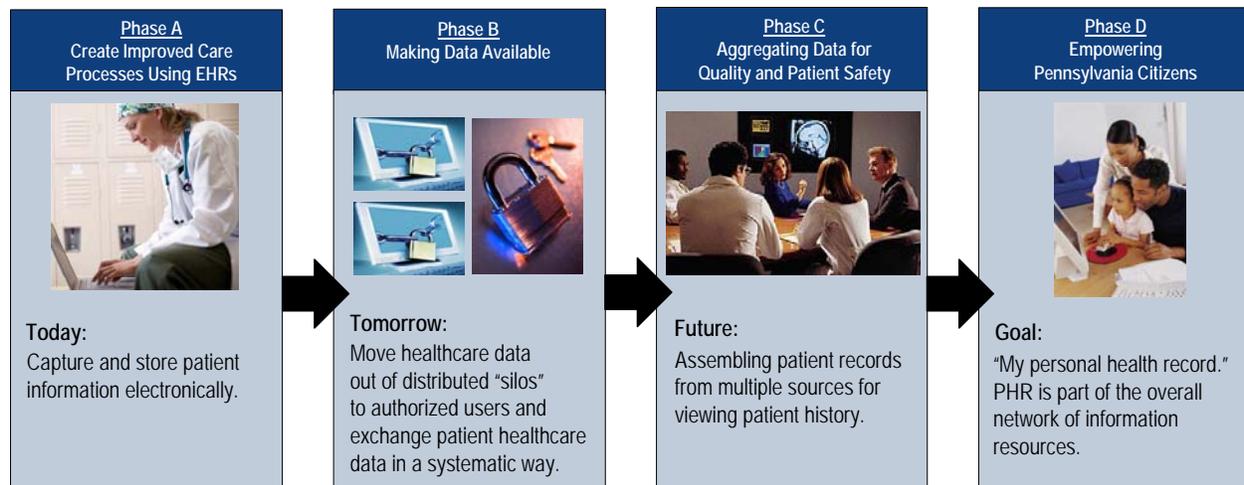
Throughout the two-year history of PAeHI and the Strategic Planning Retreat discussions, it has become apparent that an incremental approach would be needed to reach our goal. This type of incremental approach allows the HIE to show early progress, create value, and maintain momentum and focus on mid-term and long-term activities prioritized by criteria such as urgency and feasibility. Also, any successful long-term HIE initiative must be consumer-focused, involve consumers early and enable consumers to make more fully informed choices in their own care. Therefore, it is critical that each local HIE effort:

- Has an effective plan for consumer participation and education
- Ensures privacy and security needs are met in compliance with the law
- Identifies core values and goals associated with the HIE
- Promotes sustainability (organizationally and financially)
- Increases quality and performance of healthcare

Evolution of the Electronic Patient Health Record

An essential characteristic of the recommendations found in the *Connecting Pennsylvanians for Better Health* is the focus on patients. Specifically, their clinical data and its electronic transformation into ever-improving completeness at the point of care, clarity, communication, organization and presentation to serve not only the needs of the patient, but their physician(s) and others involved in their care and health. The four phases (i.e., Today, Tomorrow, Future and Goal) outlined below, provide the schematic focal point of the *Connecting Pennsylvanians for Better Health* report. These phases demonstrate the direction for the foundation and development of Pennsylvania's health information exchange initiatives.

Diagram A: Evolution of the Electronic Patient Health Record



Phase A: Create Improved Care Processes Using EHRs

Many healthcare providers are generally at this phase today. They are in various stages of moving from paper medical records towards capturing and storing patient clinical information electronically. Providers should be encouraged to move towards implementing standards-based electronic health records.

Phase B: Making Patient Data Available

This “Tomorrow” phase involves freeing clinical data from silos by creating secure, robust information delivery pipelines. Moving from paper to electronic transactions to facilitate the delivery, completeness, security, privacy, reliability, timeliness of information delivery, and implement other value-added services to patients, physicians and other care givers. In short, technologically improving today’s complex, fragmented, poorly functioning information delivery systems in preparation for Phase C.

Phase C: Aggregating Each Patient’s Data for Care, Quality and Patient Safety

Assembling an electronic clinical data summary of each patient from across many sources of care, for use by their clinicians and other authorized caregivers to facilitate and improve real-time clinical decision-making.

Phase D: Empowering Pennsylvania Citizens

Mobilizing the patient’s clinical data to other tools and systems of their choosing in order to improve patient-clinician collaboration (e.g., Personal Health Record Systems, disease and chronic care management programs, drug interactions, mental health facilities, and research programs).

The following descriptive materials have been organized into four phases (A-B-C-D). Each phase corresponds to a logical sequence of HIE activities and services expected in new local initiatives in order to address the goals and principles outlined in this report. The phases are not intended to be prescriptive, but are recommendations of sequence based on the analysis of a few of the strongest community-wide HIEs in the U.S. and on the priorities reflected in the *Connecting Pennsylvanians for Better Health*. The outline for each of the phases is as follows:

Phase

- Description
- Impact (Benefits and Beneficiaries)
- Challenges (Legal, Technical and Financial)

Phase A
Create Improved Care
Processes Using EHRs



Today:

Capture and store patient information electronically.

Phase A: Create Improved Care Processes Using EHRs
Streamlining the Current Process

Current State

In today's healthcare system, clinical results and reports are delivered to the requesting physician from each of the clinical service providers to which a physician refers their diagnostic and therapeutic work using a wide variety of methods – faxing, courier, telephone, direct line printers, and mail. Each clinical service provider (e.g., hospitals, laboratories, imaging centers and specialty testing centers) has their own results delivery processes(s) specific to the recipient of the information. Errors and inefficiencies can be introduced in the current results delivery process: the wrong result is sent to the provider, no result is sent, the result is delayed, results are not sent to 'copy to' physician, and the transmission is interrupted and resulting in duplicate or partial reports.

Clinical service providers typically have complex, non-closed loop mechanisms for the delivery of hundreds or thousands of results and reports on a weekly basis in various forms, all of which do not assure the delivery and receipt of results and reports. When the physician's practice does not get the results, an "error correction process" (or 'call back') begins. The 'call back' process begins with individuals in both organizations engaged on the phone or other means to correct the problem, taking a great deal of time.

In the error prone, non-closed loop process, inefficiencies can be abundant; additional or duplicate testing may be done to solve the problem, repeat visits or phone follow-up may be required, staff time is wasted, the physician does not have timely and reliable access to data for decision making, costs may increase and the patient may get frustrated. An example of the current state is described below.

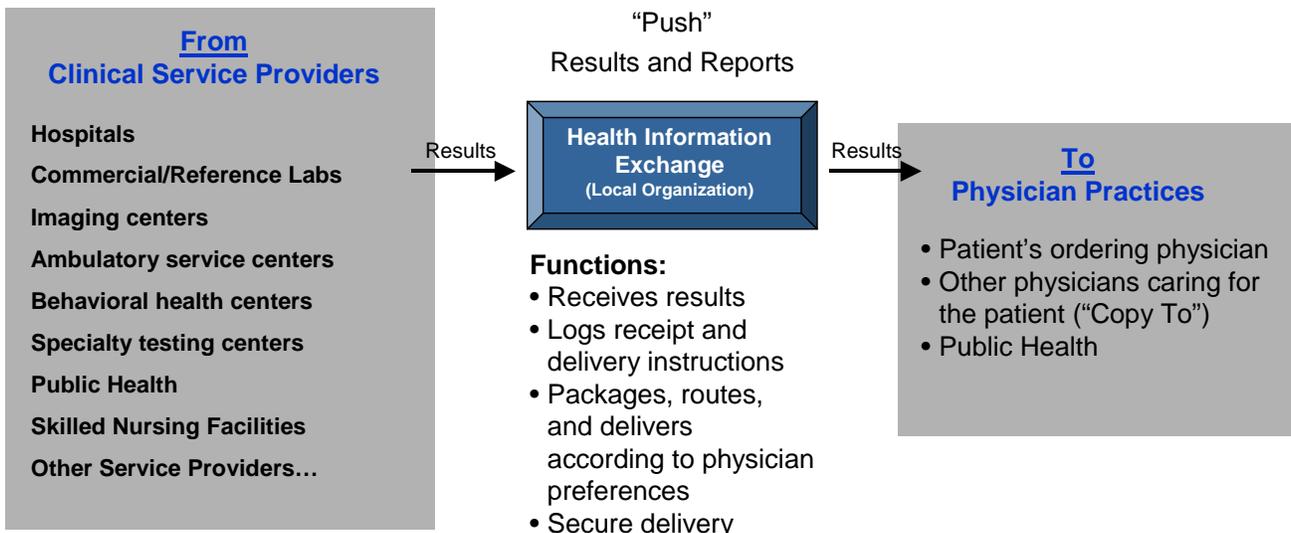
Today's Scenario

The patient, Mary, arrives at the orthopedic surgeon's office for her scheduled pre-op appointment for knee replacement surgery. The surgeon, Dr. Smith, is made aware that Mary is waiting in the exam room. He plans to view Mary's knee films and laboratory results that were completed two days ago. The x-rays are available, but the surgeon cannot find Mary's laboratory results. The surgeon asks the nurse to call the laboratory to obtain the patient's results. The nurse calls and the line is busy. After several attempts, the nurse finally reaches the laboratory, and after waiting for the results to be located, the nurse now awaits a fax copy of the results. Due to the unavailability of the laboratory results, Mary's appointment time is now past, she is anxiously waiting for clearance for surgery, and the surgeon's schedule has to be adjusted to see Mary once the results are received. The current state example described above is not the "best practice" for patient care. The recommended changes to streamline the current process are described below.

Future State

A local health information exchange is formed and contracts are completed to provide a new results delivery service for any and all clinical service providers. The HIE maintains a comprehensive directory of detail authorization and delivery instructions, as well as a directory of all customers (physician practices, clinicians and other care providers). Each clinical service provider works with staff from the HIE to direct their results, and reports transactions to the local HIE for delivery to the clinical service provider's customers according to instructions that they received from the ordering physician. The physician practice may specify exactly what method or methods they want to be used to deliver the results and reports to their practices (e.g., faxing, printer, computer or other methods supported by the HIE as per a contract with the clinical service provider). Optional services may be provided to the clinical service providers including delivery to public health or deliveries from public health to physician practices under other contracts. The HIE will provide various interface reports, receipt and logging processes documentation, delivery and call back reports and central call center services to address physician practice calls and clinical service providers issues. The HIE may also provide reprint services directly from the HIE interface or from the physician practice site.

Diagram F: Phase A – Create Improved Care Processes Using EMRs



Note: Clinical Service Providers will achieve a range of benefits that vary greatly across the region, from minimal to dramatic improvements. This range is due to differences in current results delivery processes and the extent to which providers adopt standards-based HIT systems.

Tomorrow's Scenario

The patient, Mary, arrives at the orthopedic surgeon's office for her scheduled pre-op appointment for knee replacement surgery. The surgeon, Dr. Smith, is made aware that Mary is waiting in the exam room. Mary had pre-operative diagnostics performed a few days ago and is waiting for Dr. Smith's review. Since the x-rays and the laboratory results have already been

incorporated in to Dr. Smith's workflow, they are available for Mary's office visit and he is able to complete her office visit in a timely and efficient manner.

Financial Challenges/Issues (Revenue, Savings, and Costs)

Revenue

- The HIE will charge for the results delivery services based on the characteristics, the size of the organization, the volume and scope of the results and the interfaces that must be developed. One-time services such as interfaces would usually be charged for on a project basis unless the HIE chooses to amortize those expenses over the length of their contract. This, of course, will require the HIE to raise more working capital to finance these services. The revenue structure for these initial results delivery services may be different between sponsors and clinical service providers who are just using the services. Most frequently the general customers of the HIE will be asked to pay for the services on a monthly subscription basis or a combination of subscription and transaction fee basis.

Savings

- Other established HIEs have reported the costs of the results delivery process, prior to the HIE being active, to be between \$.75 and \$1.25 per report. The HIE charges (now that they are active) were reported by Indiana Health Information Exchange (IHIE) in Indianapolis at between \$.17 and \$.35 per report. These fees are most frequently paid by the clinical service providers whose results are being delivered by the new, more efficient service of the HIE.
- A complete review of current results delivery processes and the costs of results delivery at each clinical service provider will provide the foundation to determine the size and scope of the benefits that would be available. This will only be determined on an HIE-by-HIE basis. One should not overlook the costs/benefits of the reduction or elimination of the 'call back' process both at the physician offices and in the various departments within the clinical service provider. Additionally, the increase in customer service to the ordering physician and to the patient should not be overlooked, either. Measurements should be identified and reports developed as part of the justification and ongoing confirmation of benefits.

Costs

- The working capital needed should include the cash flow required for the ramp up of adding new clients and the slope of volumes, if pricing is on a transaction basis.
- It is unclear exactly how much start up and working capital is needed for Phase A. Estimates that are quite frequently discussed are numbers between one and two million dollars. The annual operating costs for a Phase A results delivery HIE in a large region of approximately 500,000 patients should range between \$2.5 to \$4.0 million dollars per year when fully operational. These costs may or may not include the amortization of hardware and software depending on the specific vendor selected, the pace of the implementation, in-sourced or outsourced technical services and any other specific characteristics of the product and service (e.g., business interruption services).
- Clinical service provider interface costs to the HIE may be addressed by a number of different financing methods in order to align benefits and costs. Ongoing maintenance of the interfaces would be facilitated by the HIE but paid for by the clinical service providers.

Phase B
Making Data Available



Tomorrow:

Move healthcare data out of distributed “silos” to authorized users and exchange patient healthcare data in a systematic way.

Phase B: Making the Patient’s Data Available
Building Upon Phase A – Making the Patient’s Data Available (to physician practice electronic medical records)

Current State

With the increasing adoption of electronic medical records by physicians, clinical service providers (e.g., hospitals and labs) are experiencing the first requests from physician practices for electronic interfaces of results and reports to their newly acquired electronic medical records. The increased number of requests is rather new for some clinical service providers. However, these requests are not so new for the large national and local labs that have been receiving these same requests and have been providing these interfaces for some time.

The national focus on, and promotion of, EMRs to physicians (with reimbursement increases, incentives and other encouragement) have generated significant interest and increase in purchase of such systems. The national averages of EMR

market penetration are reported at less than 20 percent. As more practices purchase and implement EMRs, they will learn that EMRs do not contain all of a patient’s data immediately. No results from outside their practice like lab, radiology, medication history, hospital results or reports; or results from referrals to other physicians are available until they are manually entered into the system.

Today’s Scenario

The experience of many clinical service providers, who have been involved with creating these interfaces has been that they are expensive, time consuming and unpredictable. The physician practices generally do not have any experience with clinical interfaces nor do they have experienced staff to assist with the projects. Many were unaware of the necessity, difficulties and costs of interfaces when they bought the application or were told they would be developed by their vendors. Interface project costs of ten, twenty or thirty thousand dollars per practice are frequently experienced and EMR vendor support for interfaces can be inconsistent. Some clinical service providers have delayed or postponed dealing with the physician practice requests for interfaces because of the number of requests or are providing a portal instead.

All of this means that the physician practices have to wait for various interfaces to come up, use multiple portals, scan paper results into their EMRs, essentially not simplifying or streamlining processes. It is envisioned that national standards and the CCHIT will require physician practice EMRs to have these interoperable electronic results delivery software components. The current state example described above is not the “best practice” for patient care. The recommended changes to streamline and simplify the use of HIT with HIE are described below– Future State.

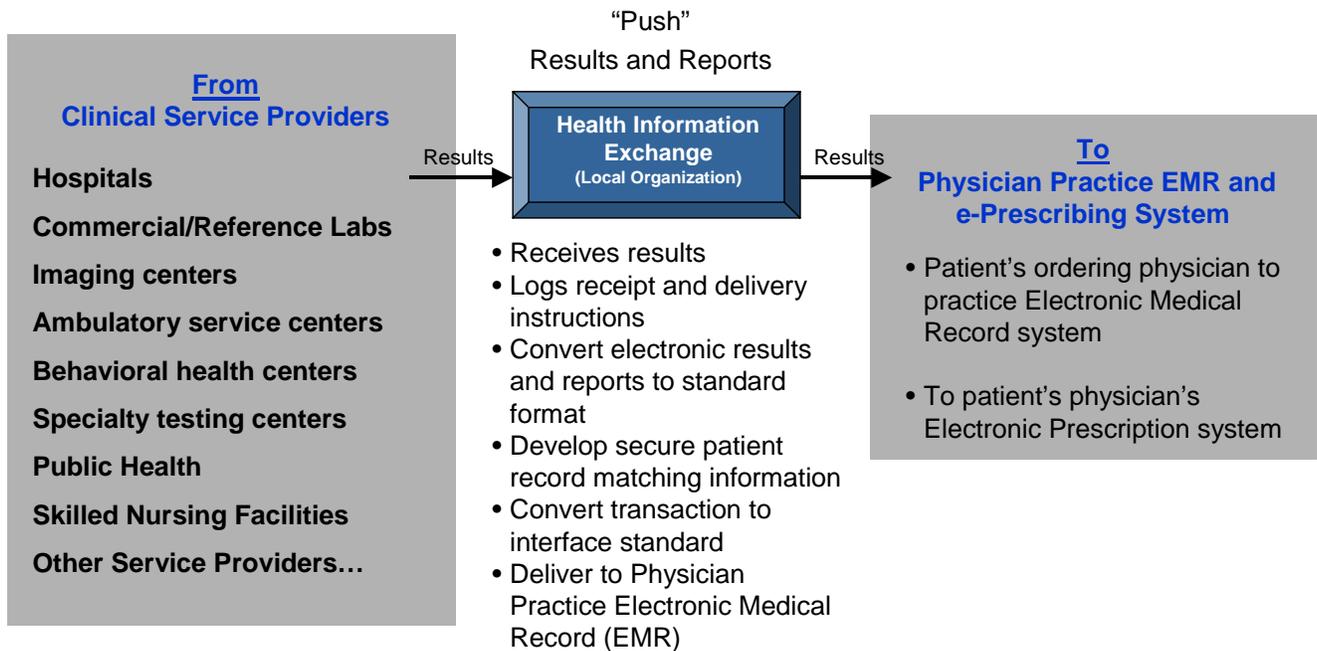
Future State

The local HIE will provide results and report interfaces to physician practice EMRs from clinical service provider results being delivered to the HIE in Phase A. These interfaces could be provided to any physician practice from all clinical service providers wishing to have these interfaces developed and implemented.

In this phase the local HIE will assist with electronic interfaces of the clinical, patient registration and record identification information to the physician practice's HIT application (e.g., practice management, electronic medical record and e-Prescribing applications). These interfaces would be facilitated by the HIE staff and system services and the respective application vendors. This service will provide significant improvement in the integration of patient data with specific HIT applications. The benefits will be lower costs of interfaces to all participants, reduction of certain barriers of adoption to EMRs and e-Prescribing applications by physician practices. All of which provide the pathway for improvements in the quality and depth of clinical data in EMRs.

The various local HIE efforts and the statewide PAeHI can dramatically improve the environment for EMRs and e-Prescribing through the development of sharable interface libraries, innovative contract terms with EMR vendors in Pennsylvania, as well as standardized interfaces from national laboratories and pharmacies, and pharmacy benefit managers.

Diagram G: Phase B - Making Patient's Data Available



Impact of Phase B

The impact of making data available electronically is a significant change. The following table displays the benefits of making patient data available electronically and also demonstrates the beneficiaries (those who benefit). Some beneficiaries have stronger benefits than others due to the type of information being exchanged or the direction of the flow, as highlighted in the following table.

Beneficiaries	Benefits
<p>Clinical Service Providers</p> <p>(e.g., hospitals, laboratories, image centers and specialty testing centers)</p>	<ul style="list-style-type: none"> • Reduces cost of results delivery by clinical service providers, improves reliability and timeliness, and provides a uniform high quality automated delivery process (cost savings) • Increases patient safety and quality of service • Eliminates the need for myriad redundant communication network connections to physician locations specifically for reports and results • Reduces or eliminates the need for the maintenance of multiple provider delivery directories • Reduces the staff requirements at the clinical service providers for call-back staff and other help desk functions • Provides management with the customer service level measurements and performance monitoring • Leverages a common infrastructure to provide multiple delivery options through the HIE to numerous locations and customers • Reduces the costs of continual internal enhancements to result and report delivery systems and technology by leveraging the shared infrastructure • Builds trust and experience among stakeholders in the HIE during this beginning phase of service • Provides a vehicle for the delivery of clinical data and medication history from national labs, Pharmacy Benefit Management companies, pharmacy retail, and referral centers • Lowers cost and increases immediate value (esp. to clinical service providers) and creates early-sustainability business case
<p>Physicians</p>	<ul style="list-style-type: none"> • Offers one point of contact for physician offices to follow up with if any clinical results have not been delivered • Decreases time looking for data and information – timely receipt of results • Mirrors current clinical work flow with new technology through HIE • Requires little or no change in current technology by physicians’ offices • Provides an enhanced results delivery service with tracking mechanisms capable of supporting problem resolutions regarding results status • Provides physician practice reprint services to reduce call-backs to clinical service providers for reports that are misplaced or locally unavailable • Provides a uniform high quality channel for public health clinical reporting

Beneficiaries	Benefits
Patients and Families	<ul style="list-style-type: none"> • Reduces the duplication, mileage and time consumption of carrying patients' records to and from a primary care physician to the specialist • Provides care providers with more access to complete data (improved outcomes) • Reduces the wait times due to call-backs or searching for the patient's clinical results, referral documents • Exports patient's clinical information from clinical service provider "silos" into a HIE delivery technology which improves delivery to all the patient's physicians and the ability to retrieve and reprint when needed to save time • Provides the ability to forward to other physicians or care delivery sites through a request to their physician
Public Health	<ul style="list-style-type: none"> • Benefits similar to physicians' (increased delivery time of results, reduction in errors, etc.) • Ability to use the HIE results delivery system to deliver similar transactions to public health agencies when authorized or required • Ability for public health to deliver results and reports to specific physician practices • Possible channel for public health communications to and from local public health as well as state public health agencies if an HIE is up and running in a region
Quality improvement organizations (statewide, regional, and local)	<ul style="list-style-type: none"> • Decreased cost of data abstraction • Increased scope and thoroughness of quality reviews • Statistical robustness • Opportunity to accurately identify subpopulations where quality lags
Payers	<ul style="list-style-type: none"> • Lowers costs due to the potential decrease in missing or unavailable test results, overall resulting in a reduction of duplicate tests
Employers	<ul style="list-style-type: none"> • Potential for reduced premiums as a result of reduced duplicative testing

Challenges of Phase B

The most critical legal, technical and financial challenges in making data available are detailed below. In order for this phase to succeed, these challenges will need to be addressed.

Legal Challenges/Issues

Legal issues related to the formation, organization, and funding of a HIE:

- In forming an HIE, numerous legal issues arise such as corporate form, system governance, who participates, terms of participation, criteria for violation, sanctions, indemnification, obligations upon receipt of public funds, etc. The options and potential legal implications will need to be examined.

- Parties that join together to form an HIE may include one or more tax-exempt entities. Tax-exempt organizations are limited in their ability to provide financial or other benefits to a private individual or entity. These laws must be addressed in structuring a local HIE and deciding terms of participation.
- The physician self-referral (Stark) and Anti-Kickback statutes must be considered in structuring an HIE, to ensure that health systems and physicians can work together in developing an effective HIE without being in conflict.

Legal issues related to transfer of data:

- This phase is a continuation of a current provider-to-provider transfer of health information; the only change is in the mode of transfer. Changing the mode of transfer should not violate current HIPAA privacy requirements, including requirements for use and disclosure of protected health information, and the exercise by patients of their right to request access, amendment, restrictions, and an accounting of disclosures of their health information. Likewise, there should be no change in the responsibilities of sending and receiving providers to provide patients access to their medical records under the state Medical Records Access Act.
- Moving from paper-based information and processes to electronic-based information and processes requires risk analysis and compliance with HIPAA security rules. Some providers may need to comply for the first time, while other providers will need to review new technological uses to ensure security safeguards are adequate to address any new or increased risk associated with the security of electronic protected health information.
- This phase has both the potential to increase exposure to liability and to reduce exposure.
 - Risk of liability for medical malpractice is reduced by timely receipt of information, eliminating multiple (and possibly inconsistent) reports.
 - Going from paper to electronic information and transfer potentially increases the risk for privacy/security breaches, and the scope of the impact of a breach (e.g., many patients vs. one patient).
 - There is increased potential for liability for each step added to the system (e.g., potential for errors when health information is electronically transferred through an interface to directly populate an EMR).
 - The potential for liability is decreased when automation increases the quality and timeliness of the patient information and thereby reduces medical errors.
- There is a potential for liability of the HIE in an action brought by the physician or patient (under a third-party beneficiary theory) if electronic protected health information is not transferred in accordance with the terms of the agreement between providers and the HIE. While there is the potential for a patient bringing a breach of privacy claim under common law or state law, a patient has no private cause of action for HIPAA violations.

Technical Challenges/Issues

Technical challenges and issues include:

- Clinical data must be safeguarded to preserve confidentiality and privacy. A broad array of mature technology exists to protect data in transit. These technologies are implementation-dependent.
- Authentication of clinicians and other designated users is needed in order to provide sufficient identifying credentials to gain access to the results delivery system.
- There is a need to create reliable, temporary data storage, which will facilitate disaster recovery and audits of access to records.
- A provider index is needed as well as a maintenance process for keeping the information up to date. Information necessary to identify and deliver information to clinicians must remain current for the system to function appropriately. Processes for maintaining provider information (including name, telephone, fax, and physical location) need to be established.
- Messaging standards (including confirmation of delivery) need to be implemented in order to maximize the value of results delivery and lay a foundation for future health information exchange activities based on standard methods for transmitting data.
- Must negotiate, in each region, the non-functional requirements such as required turnaround time, retention period, and other business model issues.

Financial Challenges/Issues (Revenue, Savings, and Costs)

Most of the financial challenges described in Phase A apply here as well.

- The interfaces from the clinical service providers to physician practice EMRs and to physician practice e-Prescribing systems provide opportunities for reducing costs and enhancing physician practice HIT adoption and interoperability with physician practices. The charges for this service should be incurred by those who benefit. The principle discussions on this topic revolve around a shared cost by the clinical service providers and the physician practices, however, this revenue structure has yet to be implemented in a functioning HIE.
- The payment for these services could be shared across all clinical service providers and the physicians requesting them or through a number of other options. We expect substantial savings (up to 60 percent over current point-to-point options) from this shared interface development service provided by the local HIE.

Phase C
Aggregating Data for
Quality and Patient Safety



Future:

Assembling patient records from multiple sources for viewing patient history.

Phase C: Aggregating Each Patient’s Data for Care, Quality and Patient Safety

There are two stages within Phase B. The first stage aggregates the results information (delivered in Phase A) into a repository to create a more comprehensive view of a patient’s past care. The second stage integrates the patient’s data from the physician’s EMR into the aggregated repository to ensure more comprehensive patient data.

The creation of an aggregated patient summary was considered the number one priority of all committees. While there are many benefits from having a comprehensive view of the patient’s past care there are also complex issues in the debate about who will pay for these services.

Current State

Today a patient’s medical history may be dispersed out across several different information systems and organizations. A comprehensive view of a patient’s past care requires the time-

consuming request and review of multiple paper charts, and is highly prone to both missing information and transcription error. This is especially crucial in emergency care where the lack of timely access to aggregated and standardized patient care data can lead to decreased healthcare quality and patient safety. An example of the current state is described below.

Today’s Scenario

Jane arrives at the Emergency Department (ED) with her niece. She is lethargic and confused and the niece can offer only limited information. The patient is a widow, living alone at home, who overall is functioning well until she calls the niece and sounds somewhat confused and out of breath. When the niece arrived, she found Jane in her current state. An ambulance was called and the patient was transported. Unfortunately, the niece is not aware of what medications her aunt is currently taking or her medical history. When Jane arrives at the hospital she is noted to be feverish, minimally conversant, and short of breath. Diagnostic tests suggest that the patient has an infection and a chest x-ray confirms she has pneumonia.

Without having the patient’s history available the emergency room physician needs to get her started on an antibiotic in anticipation of admission. Jane is given a commonly used intravenous antibiotic that she, unfortunately, is allergic to. This causes a moderate allergic reaction that prolongs her stay, causes many additional tests to be performed and at the least, causes Jane some discomfort and inconvenience and adds to her recovery time.

The current state example described above is not the “best practice” for patient care. The recommended changes to streamline the current process are described below– Future State.

Future State

All medical information is sufficiently aggregated and standardized to facilitate retrieval of information at the point of care. Standardization would include vocabulary standardization, Master Patient Index and many system interfaces. This information would be accessible to not only the patient's pre-authorized physicians, but to a treating Emergency Department physician as well. Additionally, since this information is stored with the ability to query data, public health tasks such as disease surveillance can be performed. Allowing information to be imported automatically provides many benefits: import into medical record systems reduces costs and transcription errors; import into clinical (and patient) decision support systems automates quality and safety alerts and reminders; and import into public health surveillance and management systems facilitates automatic outbreak detection and management of public health emergencies.

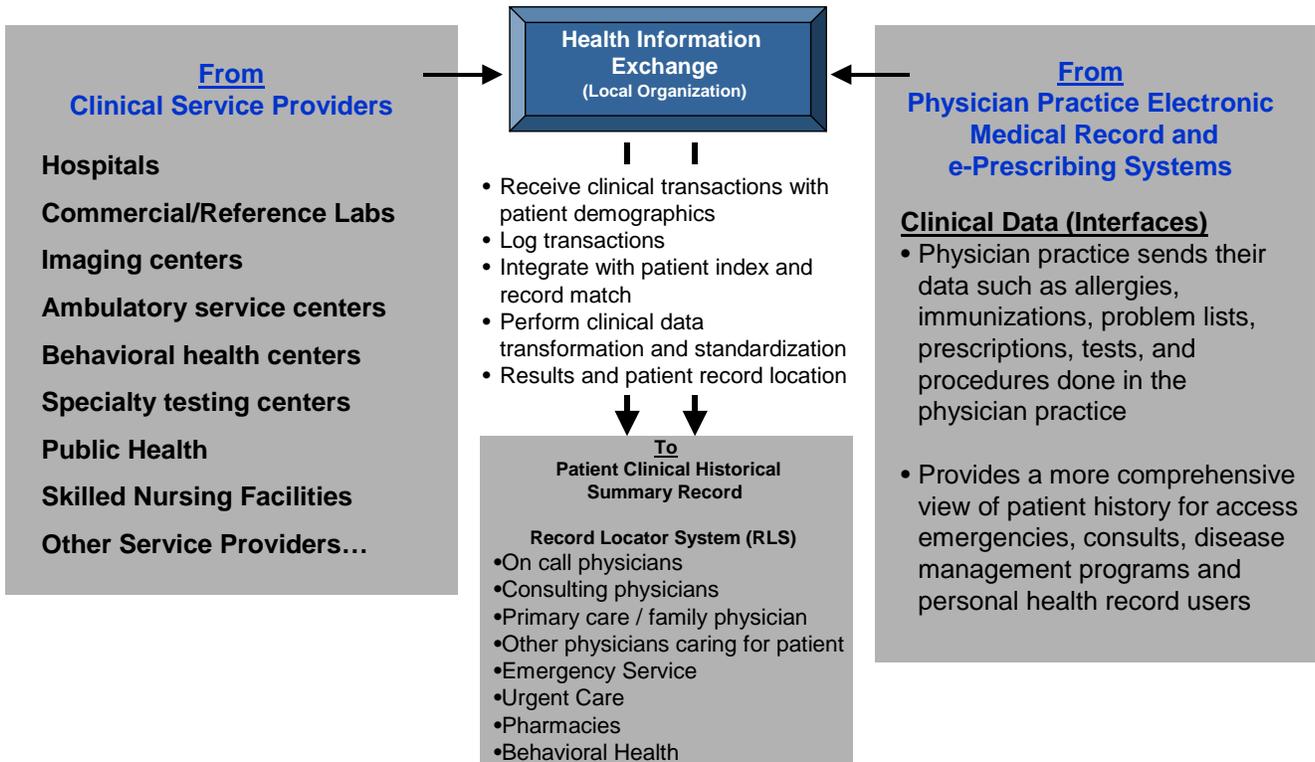
Tomorrow's Scenario

Jane arrives at the Emergency Department (ED) with her niece. She is lethargic and confused and the niece can offer only limited information. The patient is a widow, living alone at home, who overall is functioning well until she calls the niece and sounds somewhat confused and out of breath. When the niece arrived she found Jane in her current state. An ambulance was called and the patient was transported. Unfortunately, the niece is not aware of what medications her aunt is currently taking or her medical history. When Jane arrives at the hospital she is noted to be minimally conversant, and is short of breath with a fever. Diagnostic tests suggest that the patient has an infection and a chest x-ray confirms she has pneumonia.

The ED physician has decided on admission and to start an antibiotic. With the patient's consent, the physician accesses the local HIE where he notes all of Jane's medications, who her primary care physician is and, most importantly, that she has allergies to specific antibiotics. With this in mind, he arranges for the hospital admission, and with the patient's own primary care physician, is able to make sure that she gets all her routine medications, and places her on an appropriate antibiotic. Jane improves quickly and is able to go home in a few days.

An additional step that can be added within this phase is to send aggregated data out to all contributing sources. This closes the loop so that all parties have comprehensive patient data without having to access an additional application. Technical challenges of building the interfaces back to each contributing data source will increase, in this stage.

Diagram H: Phase C - Aggregating Clinical Service Provider and Physician Practice Data for Quality and Patient Safety



Impact of Phase C: Aggregating Data

The impact of aggregating data is a significant change. The following table displays the benefits of aggregating data and also demonstrates who benefits. Some beneficiaries have greater benefits than others due to the type of information being exchanged or the direction of the flow.

Beneficiaries	Benefits
Clinical Service Providers (e.g., hospitals, laboratories, image centers and specialty testing centers)	<ul style="list-style-type: none"> Reduces unnecessary admissions or costly ED workups on patients with known histories and frequent ED visits Reduces inappropriate care, unnecessary testing and avoidable risks when a patient’s prior history is available to urgent care centers, emergency service departments and other triage sites Improves care and reduces risk to patients who are in the care or in disease management programs or chronic care coordination programs if the patient history across the community is available to them Provides a comprehensive record of patient history including medication history that would help hospitals with the medication reconciliation process Improves reliability, and timeliness, and provides a uniform high quality automated delivery of secure and comprehensive views Provides a vehicle for the delivery of clinical data and medication history from national labs, Pharmacy Benefit Managers, pharmacy chains, and referral centers

Beneficiaries	Benefits
Physicians	<ul style="list-style-type: none"> • Provides the ability to view a comprehensive record of medications, laboratory results, allergies, procedures and other information related to a specific patient • Decreases time looking for data and information • Improves internal office operations • Provides timely results retrieval and notification to the clinician • Reduces adverse drug-drug or drug-allergy interactions • Reduces redundant lab tests and procedures • Enhances communications between multiple providers who may be caring for a single patient • Improves ability to analyze patient-centered data to identify and re-engineer care processes • Assists patients in conserving resources from not having to repeat tests, spending extra time with referrals and following-up
Patients and Families	<ul style="list-style-type: none"> • Improves patient safety • Improves controls on privacy and confidentiality • Provides to the care provider the patient's medical history, so the patient does not have to repeat it several times to different care providers • Reduces repeat testing, time delays, discomfort and additional coinsurance and deductible charges Increases confidence in the provider environment due to their access to the patient history • Provides opportunities for the system to communicate special protocols and disease management programs • Allows the capability of providing the patient a copy of the work performed on this encounter and the previous history
Care coordination / Care management providers (integrated within clinical service providers or via collaboration with external resources)	<ul style="list-style-type: none"> • Longitudinal support and monitoring for the chronically ill • Identify deficiencies in care of patients with complex needs cared for by many providers • Potential to intervene earlier in high-risk populations to reduce complications and cost • Efficient case-finding of patients eligible for and likely to benefit from care management services
Public Health	<ul style="list-style-type: none"> • Provides benefits similar to physicians (increased delivery time of results, reduction in errors, etc.) • Allows for electronic communicable disease reporting (e.g., lead toxicity, HIV, sexually transmitted diseases) • Facilitates data population for disease surveillance, clinical registries, and chronic disease management

Beneficiaries	Benefits
Quality improvement organizations (statewide, regional, and local)	<ul style="list-style-type: none"> • Opportunity to develop increasingly sophisticated quality metrics (e.g., longitudinal patient-centered measures) • Opportunity to broaden quality measures to cover a larger number of evidence-based care standards • Opportunity to accurately identify subpopulations where quality lags • Greater feasibility to pursue root cause analyses
Health plans, Insurers, Employers, Government Health plans	<ul style="list-style-type: none"> • Reduces the claims from duplicate/repeat testing and treatment • Provides opportunities to enhance patient safety and thus reduce errors and additional cost due to availability of patient history • Reduces unnecessary risks of errors due to availability of history, allergies, and medication history • Reduces ED visits and hospitalizations

Challenges of Phase C

The most critical legal, technical and financial challenges in making data available are detailed below. In order for this phase to succeed, these challenges will need to be addressed.

Legal Challenges/Issues

Legal issues related to the formation organization of a HIE:

- Same issues listed in Phases A and B.
- There is potential for intellectual property rights issues to arise from the creation of the system. Intellectual property issues are more likely to arise in Phase B, especially with regard to who owns the processes for receiving, transforming, and transmitting data.
- Phase C involves the standardization of data elements, raising the potential for the HIE to be a “covered entity,” subject to the HIPAA privacy and security rules. This status is of concern because the HIE would then be accountable directly to patients who wish to exercise their rights (e.g., rights to access information, request amendments, request restrictions, etc.). In Phases A and B, patients would exercise their rights with their healthcare providers.

Legal issues related to transfer of data:

- This phase has both the potential to increase exposure to liability and to reduce exposure to liability.
 - Potential liability could increase for both HIE and participating healthcare providers regarding transfer of data because Phase C involves transformation/standardization of data and data availability to multiple providers.
 - The HIE could experience potential exposure to liability for errors that impact the patient, e.g., failure to timely transfer data, errors in standardization. The HIE could also experience potential exposure to action brought by a sending or receiving healthcare provider, or by a patient who is harmed under third party beneficiary theory.
 - Risk of liability for medical malpractice may be reduced because of better patient outcomes from efficient and timely receipt of data needed for treatment, and potential reduction in errors due to automation.

- Providers could experience potential for increased malpractice exposure based on increase in information available, failure to obtain information that might have improved patient outcome, flaw in system (e.g., injury results from relying on data associated with wrong patient, incomplete or inaccurate data.)
- Phase C allows clinical service providers to query and retrieve stored data from multiple providers. As the complexity of the system increases, so does the challenge of providing adequate security safeguards under HIPAA. HIPAA security compliance is an on-going process. As technology increases or changes, covered entities must conduct an assessment of the potential risks and vulnerabilities to the confidentiality, integrity, and availability of electronic protected health information held by the entity, and implement sufficient administrative, physical, and technical safeguards to protect information that the covered entity creates, receives, or maintains. Security issues in this phase include:
 - Identification / Correlation of Data with Patient
 - A master patient index based on Social Security numbers will not be appropriate per the state Social Security Number Privacy Act, which limits the collection and use of Social Security numbers. Even if the law allows this use, it is unlikely to be acceptable to the public given recent concerns about identity theft.
 - Authentication (determining that person attempting access to data is who they claim to be).
 - Ensuring integrity of data, i.e., that data has not been altered or destroyed in an unauthorized manner.
- Patients should be able to control access to their health information by having the opportunity to “opt-out” of HIE. If patient opts-out, this should result in excluding the patient’s health information from HIE completely. Participant providers and HIEs would be unduly exposed for inadvertent breach should the patients request restrictions on disclosure for only some of their health information. When the patient has directed that certain information be excluded from the record or declines to participate in HIE, provide malpractice protection against related claims.
- As the complexity of systems increase, so does the challenge of providing adequate privacy safeguards under HIPAA and other privacy laws. Examples of privacy challenges in this phase:
 - HIPAA permits the sharing of protected health information for purposes of treatment, payment and healthcare operations. While information may be freely shared for treatment purposes, disclosures for most other purposes must be limited to the minimum amount necessary to accomplish the purpose of the disclosure. The ability to parse electronic records transmitted through an HIE to comply with this limitation may be limited.
 - State law regarding privacy and security may restrict access to certain types of health information (e.g., mental health, HIV/AIDS, substance abuse), even for treatment purposes, absent written consent. However, written consent is not required for a bona fide

medical emergency. Federal law also imposes significant additional restrictions on the use and disclosure of certain records related to treatment for drug and alcohol addiction. It may be challenging to establish an effective way of identifying sensitive records and creating access rules that permit compliance with these requirements.

- Under HIPAA and the state Medical Records Access Act, a parent has the right to access the health information of their child. However, there are exceptions where the law grants a minor the right to consent to certain treatment without a parent's knowledge or permission. These include healthcare provided to an emancipated minor, a limited number of outpatient mental health visits for minors age 14 and older, diagnosis and treatment for substance abuse, HIV/AIDS and other sexually transmitted diseases, family planning services funded by Title X, and abortion services where a judge has granted consent through the judicial bypass process.
- As the complexity of the system increases, so does the challenge of responding to the patient's exercise of his or her rights under HIPAA regarding their health information. Individuals may request, and are entitled to, a timely accounting/report regarding the inquiries made to request their health data, what data was requested, if any requests were denied, and the reason for any denials. Health information disclosed for treatment is an exception to the accounting requirement. However, system design will need to be able to track disclosures for public health and many other potential purposes.

Technical Challenges/Issues

The technology needed will expand from Phases A and B. Technical challenges and issues include:

- Create a methodology to determine unique patient identifiers (master patient index)
- Determine and implement a record locator service – today there is not a concrete technology
- Develop vocabulary mapping services in order to ensure correct mapping of like services, results, etc.
- Develop and refine messaging standards
- Manage the addition of interfaces
- Requires increased robustness of network (for storage, increased speed, disaster recovery, etc.)

Financial Challenges/Issues

Revenue

- Frequent consideration for the payment for these services is a base subscription involving the size of the population and utilization of the healthcare system and then a per person/per month or per person/per enrollee fee. Fees that have been considered previously (by other functioning HIEs) include ranges from ten cents to fifty cents per member per month based on specific characteristics of the population and the scope of services offered by the local exchange.

Savings

- It is unclear at this point specifically which stakeholders would value this information enough to pay for the building and maintenance of these data repositories along with all the effort involved in preparing the data and matching the records for its use. The range of beneficiaries is wide and varied.
- Other possibilities include gain sharing or paying a portion of the benefits from improved services, lower costs and less utilization on many fronts. Certainly, the possibilities of quality measures and increased preventative services have entered into the equation as well.

Phase D
Empowering
Pennsylvania Citizens



Goal:
"My personal health record."
PHR is part of the overall
network of information
resources.

Phase D: Empowering Pennsylvania Citizens

After the implementation of the previous two views, Pennsylvania will have the prerequisite infrastructure to export patient data to a personal health record (PHR) on an ongoing basis as the patient is engaged in health service activity such as ER visits, filling medications, obtaining laboratory tests, xrays or other healthcare services. PHR is an HIT-related software application which individuals can use to maintain and manage their health information in a private, secure and confidential environment. The PHR may be offered by an insurer, employer, or authorized care provider of the patient's choice. The individual consumer is the primary user of the PHR and authorizes access to their personal health information via the PHR. That consumer may allow access to all or part of the PHR to anyone – a doctor, family member, employer, summer camp, or insurance company. Other potential PHR users are "stakeholders" who, when the primary user of the PHR gives his or her permission, can make valuable use of the information being kept in the personal health record.¹

As patients begin to take a much more active role in healthcare treatment decisions, it becomes important to empower them with access to and control over their personal health information. This phase is very complex and the least widely implemented. Today, there still remains a lack of widespread awareness of PHR benefits, challenges, or requirements. In addition to the provision of clinical data to their PHR, the patient may chose to provide data to other clinical providers (e.g., disease management programs or the newly-formed chronic care coordination programs that have been developed under CMS's direction). Further, it is reported that home-based monitoring and health management assistance will be a growing component of the opportunities for patients to explore. These programs introduce a whole new level of patient information to accumulate and share with care givers.

¹ Markle Foundation, Connecting for Health: A Private-Public Foundation. "The Personal Health Working Group Final Report on Personal Health Records." July 1, 2003.
http://www.markle.org/downloadable_assets/final_phwg_report1.pdf

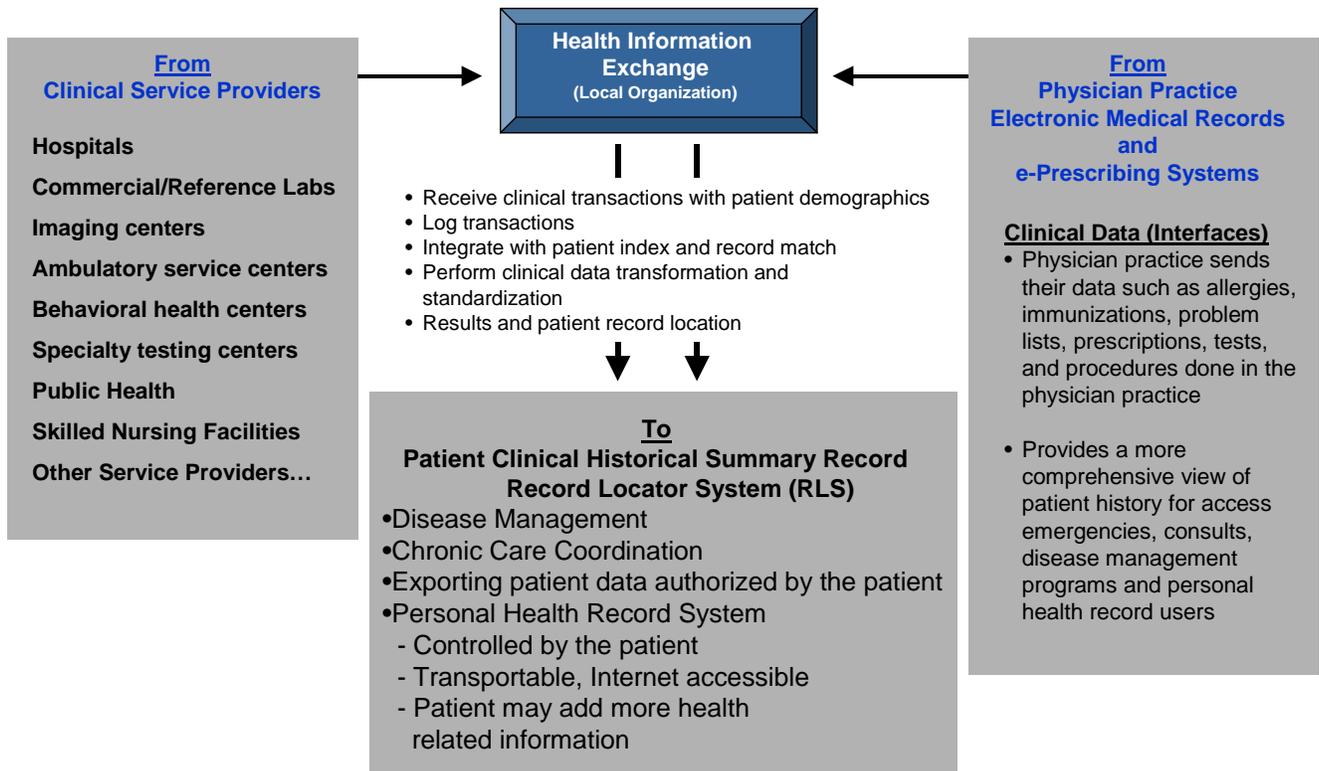
Today's Scenario

Tom is an insulin-dependent diabetic who is recording his diabetic information in a notebook. He has a visit with the diabetic nurse at the endocrinologist's office and brings along his notebook. The nurse takes the notebook and begins writing details from it into Tom's medical record.

Goal Scenario

Tom is documenting his diabetic information in an electronic personal health record. At his place of employment, he wants to enroll in a new health and wellness program being offered. As part of the program, they have a diabetic nurse and nutritionist coming in every other Wednesday. Tom gives the nurse authorization to view his diabetic information prior to his initial visit.

Diagram I: Phase D - Empowering Pennsylvania Citizens – *Connecting Pennsylvanians for Better Health*



Impact of Phase D – *Connecting Pennsylvanians for Better Health*

The following table displays the benefits of empowering Pennsylvania citizens and also demonstrates the beneficiaries. Some beneficiaries have stronger benefits than others due to the type of information being exchanged or the direction of the flow.

Beneficiaries	Benefits
Patients and Families	<ul style="list-style-type: none"> • Improves quality of care due to availability of all pertinent information at each point of care • Provides greater empowerment – each person controls his or her own PHR. Individuals decide which parts of their PHR can be accessed, by whom, and for how long • Allows patients to have the choice to include information from one’s entire lifetime and from all healthcare providers • Provides accessibility from any place at any time • Transparency—individuals can see who entered each piece of data, from where it was transferred and who has viewed it • Permits easy exchange of information with other health information systems and health professionals
Physicians	<ul style="list-style-type: none"> • Additional information is available for decision making and planning through a continuously updated personal record • Allows for electronic exchange of information with other health information systems and health professionals • Improves access to medical information
Health plans, Insurers, Employers, Government Health plans	<ul style="list-style-type: none"> • Lowers costs due to reduction of duplication of services (tests, procedures, etc.) • Improves integration of care, including programs such as disease and wellness management • Reduces lost work days • Assists in supporting a healthy workforce • Evaluates and rewards high-quality care by looking at aggregate data
Public Health	<ul style="list-style-type: none"> • Allows researchers and advocacy organizations to assess patterns of disease and treatment across the healthcare system • Provides ability to detect disease outbreaks
Government	<ul style="list-style-type: none"> • Gains in efficiency as more medical decisions are based on current and accurate information

Challenges of Phase D

The most critical legal, technical and financial challenges in empowering Pennsylvania citizens are detailed below. In order for a phase to succeed these challenges will need to be addressed.

Legal Challenges/Issues

- The HIE must carefully consider the nature and scope of its relationship with the patient (in Phases A and B, the relationship is between the patient and healthcare providers, not the patient and the HIE).
- Legal issues associated with an HIE exporting data directly to the patient vs. the patient having direct access to data within the repository must be examined. Legal and practical issues are likely to arise if the patient has direct access rights to information held by the HIE, especially if the patient is able to add or change data in any way.

- Determination of who has access rights and developing the process to ensure only authorized users can see patient data will need to be addressed. These include patient designees (e.g., designees under Powers of Attorney for Healthcare, additional clinicians, other third parties) and individuals who are legally authorized to act on patients' behalf (e.g., guardians, parents of minors).
- If the system is designed to allow patients to authorize and direct the HIE to release information for non-clinical uses, the complexity of the system and potential for errors are increased.

Technical Challenges/Issues

Technical challenges and issues include:

- Will require creating large-scale authentication schemes and mechanisms for patient authentication (no current solutions/models exist)
- Currently there is not a consistent framework for presenting and codifying information
- There will be a need to build and support HIT infrastructure and systems that are scalable
- There will be a need to plan for and manage systems with infrastructure significantly more robust and widespread than in Phases A and B
- A process for managing, reviewing and annotating data will be required
- Standards for de-identifying patient data for appropriate use will need to be agreed upon, adopted and implemented
- There are currently no published standards for data elements required to adequately populate a PHR

Financial Challenges/Issues

- Lack of proven financing strategy or demonstrated return-on-investment for implementation of PHR
- Limited understanding of or experience addressing patient and consumer information needs
- Lack of general consensus about a PHR business model discourages allocation of funding

Role of PAeHI

In recent years there has been a significant increase in the amount of activity at the national, state and local levels to create a more interconnected, electronic healthcare system. Increasingly, decisions regarding the scope and the direction of HIT and HIE initiatives will be made at the local level where healthcare is delivered. However, state-level coordination is required and should be focused on those functions that add clear value when performed at the state level. PAeHI has identified the following roles it will serve to connect Pennsylvanians for better health:

1. Identify opportunities for Pennsylvanians to use HIT and HIE to improve healthcare.
2. Educate the public providers and policy makers regarding the benefits and challenges of HIT and HIE.
3. Assist in the coordination of health IT efforts among Pennsylvania healthcare stakeholders.
4. Identify opportunities to coordinate with and benefit from federal initiatives

5. Develop statewide consensus on established and emerging standards (e.g., data, communication and reporting).
6. Work with providers, payers, policy makers to define business cases for HIT and HIE.

Recommended functions that can be implemented at the state level to support the PAeHI mission and Pennsylvania's local HIE initiatives include the following:

Legal Interpretation and Consensus

- Reduce legal and regulatory barriers for the sharing of electronic health data
- Establish or strengthen state laws to protect consumers against privacy and security breaches
- Facilitate statewide consensus of legal opinion

Standard Setting and Technical Support

- Advocate for the use of national standards (e.g., for technical and semantic interoperability)
- Provide a forum for local input to national standard setting bodies
- Promote the development of statewide master patient and provider indices and a record locator service (RLS)
- Identify and develop HIT and HIE solutions for medically underserved areas, technology challenged areas or areas falling between naturally occurring local HIEs

Statewide Coordination

- Increase collaboration with PAeHI
- Leverage PAeHI governance and committee structure for HIE and HIT advisory needs
- Provide resources to PAeHI
- Encourage local HIEs to move toward the exchange and interoperability of clinical data
- Conduct statewide medical trading area analysis

Fundraising and Administration of Statewide Funding

- Set criteria and align incentives for HIE recognition, support, and funding

Education and Marketing

- Encourage collaboration and communication amongst stakeholders regarding *Connecting Pennsylvanians for Better Health*

The Commonwealth, along with foundational local efforts, can play an important role in transforming the way that healthcare is delivered to patients in Pennsylvania. It is important to note that *Connecting Pennsylvanians for Better Health* provides a blueprint and a set of recommended strategies to foster HIE. For the goals outlined to be achieved, however, leadership at all levels is required in order to continue this dialogue and facilitate the activities needed in Pennsylvania to create an interconnected healthcare system.

Role of State Government

To maximize the benefits of continued support, funding and advocacy of local initiatives throughout Pennsylvania, it is vitally important to seek the most economical and easily deployable means to realize the benefits of secure and available HIE. In collaboration with PAeHI, the main role of the Commonwealth of Pennsylvania government is as a statewide convener and collaborator. Thirty-eight states across the country are taking the lead and promoting and encouraging dialog, convening stakeholders and providing guidance to health information exchange. Governor Rendell, through his Prescription for Pennsylvania, the Pennsylvania Department of Health, the Pennsylvania Department of Public Welfare, the Department of Community and Economic Development, and the Pennsylvania eHealth Initiative, is taking a leadership role in offering support and guidance to Pennsylvania's fledgling local health exchanges and are taking steps through this project to integrate the activities of Pennsylvania's local efforts. Though most decisions regarding the scope and the direction of HIT and HIE initiatives will, and must be made at the local level where healthcare is delivered, the following recommendations should be implemented at the state level to support the *Connecting Pennsylvanians for Better Health* vision and Pennsylvania's HIE initiatives:

Legal Interpretation and Consensus

1. Improve Legal and Regulatory Framework for Appropriately Sharing Electronic Health Data

To accomplish the goal of efficient HIE, the state will need to modify certain laws to remove legal and regulatory barriers to the electronic exchange of health information, while ensuring consumer protection of privacy and security of health information. Development of medical trading areas and an infrastructure which is flexible and empowered is essential, as is the ability of physicians and clinical service providers to cooperate in the development of HIE. As such, modifications will be needed in current state and federal legislation that continue to hinder HIE development (e.g., Stark, Anti-kickback). In addition, new state privacy and security regulations should be consistent with federal requirements and should not unduly hinder or prohibit the necessary flow of healthcare data. Due to rapid changes that occur in today's technology market, legislation and related regulations should be flexible and focus on the end rather than the means, to permit prompt accommodation of advances in technology.

Consideration should be given to revising laws relating to medical records and the disclosure of health information for consistency with specific applicability to HIT and HIE. Current laws were developed for paper records and processes. The requirements for medical records are scattered throughout Pennsylvania statutes and regulations. Requirements for health information and medical records are defined by provider type or type of health information, and lack consistency in requirements such as confidentiality, consent, and required contents of medical records. Standards for breach and sanctions also vary. Additionally, consideration should be given to developing a single uniform statute to replace the myriad of statutes that regulate medical records and the use and disclosure of specific types of healthcare information with consistent definitions and terminology.

2. Facilitate Statewide Consensus of Legal Opinion

Today there are federal and state laws that are in conflict. This adds to the complexity of implementing HIE and HIT. In order to encourage participation in local initiatives by potential HIE participants regarding the possible violation of federal and state law, the state needs to facilitate consensus of legal opinion statewide. For example, the federal Stark Law limits the investment options to provide physicians with HIT subsidies. A clear process should be created for obtaining either one or more advisory opinions from the federal government on behalf of all Pennsylvania local initiatives about Stark Law compliance. This would permit reliable guidance and address concerns for consistency across all local initiatives. Additionally, rules should be promulgated to incorporate revisions to the federal Stark law so that federal and state Stark prohibitions and exceptions are the same. Similar consensus of opinion regarding security and privacy issues will also be needed.

Standard Setting/Technical Support

1. Advocate for the Use of National Standards

As national standards for interoperability and data exchange are developed and adopted, the state should advocate, promote, align with state standards and foster adoption of the use of national standards by all Pennsylvania HIEs. The use of such standards will provide organizations with the interoperability necessary to electronically move clinical information between disparate provider organizations.

2. Provide a Forum for Local Input to National Standard Setting Bodies

National standard setting bodies will need input from those organizations and people working on the day-to-day activities of health information exchange. In order to create a statewide voice and efficiently and effectively communicate this information on a national level, there should be a state-supported forum for gathering and communicating this information.

3. Promote the Development of a Statewide Master Patient Index and Record Locator Service

The statewide master patient index (MPI) and record locator service can leverage economies of scale due to the need for all local HIEs to use MPIs and record locator services to accurately exchange patient data from disparate system and providers.

4. Identify and Develop HIT and HIE Solutions for Medically Underserved Areas, Technology

Develop HIE and HIT strategies and plans to ensure underserved areas and those that fall between naturally occurring local HIE efforts have adequate healthcare information available for citizens in those areas.

Statewide Coordination

1. Collaborate with and support PAeHI

With respect to operations, the Pennsylvania eHealth Initiative (PAeHI) should be recognized as the statewide HIE coordinating body and should be funded to provide day-to-day governance, guidance, direction and coordination to the design and implementation of local HIEs and statewide exchanges. The role of PAeHI is to assist the local HIE efforts across the state, focusing daily on operations such as resource staffing and communications in order to increase the adoption rate and successful implementation of local HIEs across Pennsylvania. PAeHI should have full-time staff that will coordinate tasks and deliverables to the local HIEs and the Commonwealth of Pennsylvania. PAeHI would be responsible for working with national resources (eHealth Initiative, Markle Foundation, etc.). As discussed previously, healthcare is local and, as such, the exchange of healthcare information occurs primarily within medical trading areas. However, there are many areas that local HIEs will need assistance with including, but not limited to: interpreting legal statutes, representation at state and national levels, identification and promotion of standard policies, procedures for HIE operation, governance, and financing as well as for technological infrastructures and education and awareness about national initiatives and standards.

Several specific recommendations have been made regarding the activities of PAeHI:

A. Serve as a Center of Excellence or Resource Center for HIEs

Promote and guide the local HIEs regarding national standards and serve as the primary resource for HIE information and the dissemination of the PAeHI resource material. It will develop guidelines that will align with national standards, assist in the removal of common obstacles across the local HIEs, and resolve conflicts between local HIEs to facilitate equitable and appropriate data sharing for the benefit of patients. It will also provide guidance regarding the interpretation of applicable laws and regulations, and when appropriate, seek definitive interpretations from state and federal regulators.

B. Utilize Committees in an Advisory Role

Using a modified version of the 2006 PAeHI committee structure would allow the Initiative to take advantage of the work and knowledge of members who have already been involved in this process. All committees would be responsible for conducting appropriate research and engaging in meaningful dialogue regarding topics of interest to the PAeHI.

C. Manage Committees and Ad Hoc Advocacy Groups

Direct, manage and integrate input from the committees and various advocacy constituents (e.g., consumers, public health, etc). This would include selecting appropriate representatives and setting objectives and work plans. These advocacy groups will provide input and feedback to the PAeHI and serve as a resource to the committees and Board.

D. Develop and Implement an Ongoing Statewide Education and Communication Plan

Develop and deliver an education plan to inform the key stakeholders, including consumers, employers, payers and providers about HIE and its benefits. It should also monitor federal developments regarding HIT and HIE and ensure that local stakeholders are aware of these developments. This includes representing the Commonwealth of Pennsylvania in national initiatives and standards development.

E. Develop a Reference Guide for Local HIE efforts

A reference guide should be developed in order to provide guidance to those individuals and organizations undertaking the formation of a local HIE. The use of the reference guide in the Commonwealth of Pennsylvania can also ensure consistency among start-up efforts. This guide should be a suggested step-by-step process for the initial phase of local health information exchange efforts, and includes numerous references to other sources of information as well as sample documents. The development of this reference guide should continue under the direction of PAeHI and be made available through PAeHI and the Commonwealth.

2. Leverage Existing PAeHI Committee Structure

Building on the existing PAeHI committee structure will allow the Initiative to take advantage of the work and knowledge of members already represented in the those committees and subcommittees. All committees will be responsible for conducting appropriate research and engaging in meaningful dialogue regarding topics of interest to the Governor's Health IT Commission and PAeHI. The committees would also provide recommendations to the Health IT Commission and PAeHI Board regarding various aspects of HIE development.

3. Provide Resources to Governor's Health IT Commission

Provide the Health IT Commission with appropriate staff, administrative support and other resources to meet its responsibilities.

4. Encourage Local HIEs to Move Toward the Exchange and Interoperability of Clinical Data

Encourage adoption of systems that can facilitate electronic access to patient clinical data across the continuum of care (e.g., wellness programs, ambulatory, primary, care, chronic care, long-term care and disease management) from a variety of healthcare sources. Access to the continuum of care data will enable providers to make better-informed decisions and ultimately improve healthcare quality and safety. This includes leveraging existing statewide data sources (e.g., Medical Assistance) and encouraging the development and use of electronic medical records (EMRs). Encourage providers to work with patient safety organizations to facilitate ways that HIT and HIEs can increase evidence-based medical care. Advocate for the use of practical and incremental steps that will gain value and begin to be self-sustaining. These steps include sharing data that is already in electronic form and delivering clinical results electronically (e.g., lab, medications and radiology results).

5. Conduct Statewide Medical Trading Area (MTA) Analysis

A medical trading area is defined as an area where a population receives the majority of their healthcare. The area typically includes groups of physicians, hospitals, laboratories, mental health providers and other healthcare providers that offer healthcare services.

To assist local HIE initiatives in their planning, it is recommended that a medical trading area analysis be performed and made available to any local HIE initiative. Specifically, this analysis is crucial to local efforts in order to:

- Identify key stakeholders
- Provide a framework for understanding services in the area
- Understand the critical mass mostly likely needed for sustainability

This information is even more critical now than it was 40 years ago during the early application of information systems in healthcare, since the vast majority of clinical information and patient encounter data now are generated and reside outside the hospital based on where healthcare delivery occurs (namely, physician offices) or where patient data are gathered and analyzed (e.g., laboratories).

PAeHI defined recommended building blocks to be used in getting regions started and these building blocks should be used as criteria when issuing state funding. The building blocks/minimums listed below were selected based upon many other general assumptions. These items, as well as further details and an example of a MTA analysis can be found in **Appendix G**.

Fundraising and Administration of Statewide Funding

1. Set Criteria and Align Incentives for HIE Recognition, Support and Funding

Financial incentives should be aligned with funding for HIE initiatives. Such funding will be critical to facilitating the growth of HIEs throughout Pennsylvania. The Administration should advocate for continued state and federal funding while encouraging participation and funding from other stakeholders (e.g., employers and payers). Inadequate funding for the early stages of health information exchange initiatives can be a barrier to entry.

Specific criteria should be developed and eligibility determined for the awarding of funds and to ensure that funding is aligned with the goals of the *Connecting Pennsylvanians for Better Health*. The following goals, objectives and eligibility criteria are recommended to be used by the Commonwealth as it addresses distributing funds appropriated for health information exchange projects across Pennsylvania.

A. Goals for Funding

- i) Projects will be designed specifically to develop community-wide healthcare information sharing, by developing local health information exchange projects.
- ii) To design and develop health information exchange projects that, while maintaining integrity of local health information and its sources, will follow standards (as defined by state and national bodies) and policies that will establish and maintain optimal health information exchange on the state level.

B. Objectives

- i) To prove that there is a return on investment associated with the implementation of a health information exchange
- ii) To ensure the development of infrastructure and processes to facilitate, over time, the interconnection of health information across the Commonwealth of Pennsylvania
- iii) To allow for the Health IT Commission to quantify the value of such activities
- iv) To ensure that Pennsylvania begins to gather “best practices” as they relate to health information exchange
- v) To ensure that the infrastructure that is adopted is available to all constituents throughout Pennsylvania

The following details are recommended goals and eligibility criteria by category. Two categories, planning and implementation have been defined based on the stages of local initiatives within Pennsylvania. It is recommended that these details be utilized to draft the actual proposal process for distributing funds.

A. Planning Category – Support for planning projects

- i. Goal Statement: To develop a feasible plan for the implementation of a health information exchange that will follow adopted standards and show how they plan to improve the quality of healthcare in Pennsylvania.
- ii. Eligibility Criteria: Organizations representing local initiatives competing for awards under the program must meet the following eligibility criteria:
 - a. Planning a formal organization
 - b. Planning to use state and national adopted standards (based on availability)
 - c. The Applicant must provide a Letter of Intent including names and signatures of stakeholders for the following reasons:
 1. Multiple and diverse stakeholders are critical to the success of a region or community effort in the decision-making processes related to the project. Such stakeholders may include but are not limited to practicing clinicians, health plans, hospitals, laboratories, public health, patient groups, purchasers, and the state, in some capacity.
 2. The applicant must plan to engage the commitment of purchasers and/or payers representing, in total, a critical mass (approximately 60%) of the covered lives in the area covered by the health information exchange project.

3. The applicant must plan to engage the commitment of a significant percentage of practicing clinicians to utilize the health information exchange capabilities included in the project
- d. Demonstrate the plan for consumer engagement and education
- e. Demonstrate how the HIE will interact in public health reporting
- f. Must provide proof of matching funds (specifics to be determined)
- g. Review Medical Trading Area analysis and statistics to determine:
 1. Medicaid population served
 2. Sixty percent of services (as defined by the HIE) are provided within community of stakeholders (e.g., the region)
- h. Willingness to document outcome measures including steps taken during funding period, successes achieved, obstacles encountered, next steps and associated time lines for anticipated future activities.
- i. Health information exchange is open to the entire community
 1. Definition of a model that is open to all parties (Payers, Providers, Employers), including all technology vendors able to operate within a set of interoperability standards
 2. Established under the premise of being an independent third party. This will facilitate the participation of normally competing organizations.

B. Implementation Category – Support for implementation projects

- i. Goal Statement: To implement a health information exchange project that has a highly developed feasible plan for implementation that includes measurable outcomes and a high level of stakeholder involvement.
- ii. Eligibility Criteria: Organizations representing local initiatives competing for awards under the program must meet the following eligibility criteria:
 - a. The applicant must be a formal organization.
 - b. The applicant must have a business plan.
 - c. The applicant must have engaged multiple, diverse stakeholders in the region or community in decision-making processes related to the project, including but not limited to practicing clinicians, health plans, hospitals, mental health facilities, laboratories, public health, patient groups, purchasers, quality improvement organizations, and the state, in some capacity.
 - d. The health information exchange capability included in the project must use state and national technical standards within a reasonable time period of their becoming available.
 - e. At least two types of data must be initially planned for exchange by the health information exchange capability, such as laboratory data, medication data, outpatient or inpatient episodes, claims data, etc.
 - f. Planned data exchange must occur between at least three different stakeholder groups, who cannot be a part of the same legal entity.
 - g. The applicant must have engaged the commitment of purchasers and/or payers representing, in total, a critical mass (approximately 60%) of the covered lives in the area covered by the health information exchange project.

- h. The applicant must have engaged the commitment of a significant percentage of practicing clinicians to utilize the health information exchange capabilities included in the project
- i. The applicant must be willing to share resources and lessons learned in the process; sharing information is vital to producing a productive health information exchange.
- j. The applicant must plan and show the progress of their use of funds and have proof of sustainability.
- k. Applicants must plan to develop specific, quantifiable milestones and benchmarks to achieve substantial improvement in three areas
 - 1. Performance measures and public reporting
 - 2. Capacity to help physicians in the community improve the quality of ambulatory care
 - 3. Consumer engagement
- l. The applicant must show how it would contribute to the already established health information exchange efforts in Pennsylvania.
- m. The applicant should consider a marketing plan for communicating quality improvement efforts considering that:
 - 1. Providers need support to improve care
 - 2. Purchasers need to reward good care
 - 3. Community leaders need to be engaged (civic, business, healthcare)
 - 4. Patients and consumers need to understand what must be exchanged and that they are participants in that process
- n. Applicant must show they have considered the sustainability of the proposed effort relating to technical, clinical and financial aspects.

Education and Marketing

Encourage Additional Collaboration and Communication Among Stakeholders Regarding the PAeHI *Connecting Pennsylvanians for Better Health*

During the course of the last two-years, PAeHI stakeholders provided valuable insight into the state of healthcare in Pennsylvania and learned about Health Information Exchange and its role in providing increased quality of care and patient safety as well as decreasing healthcare costs. To this point, stakeholders from communities across Pennsylvania should be encouraged to provide feedback on the *Connecting Pennsylvanians for Better Health*. This could be accomplished through local forums or town hall meetings conducted in at least four regions across Pennsylvania to discuss the *Connecting Pennsylvanians for Better Health* recommendations. During this timeframe, input and guidance would be sought from the entire community. Such meetings would also provide an opportunity to further educate consumers and promote consumer/patient involvement and to discuss the next steps to be taken.

In order to clarify and refine the issues addressed in this report, and to gain understanding and support of the healthcare community in order to move these concepts into reality, it is important to reach out to clinicians across the state. This can be done using the partnerships with the medical societies, the hospital association, and other healthcare professional societies throughout

Pennsylvania. Consumer/patient understanding and support are also critical to the future success of HIE. As such, reaching out to the Pennsylvania public through mechanisms other than the forums previously discussed is also important. This can be done in collaboration with existing patient and consumer coalitions and through the educational efforts of state government.

VI. CLOSING

This report is a call to action for Pennsylvania to implement the aforementioned recommendations in order to improve healthcare quality and efficiency while controlling or reducing healthcare cost in Pennsylvania through health information exchange. While federal leadership is important, it must be integrated with efforts at the state and local level. State legislatures and local governments play a critical part of overall leadership in their roles as regulators, safety net providers, and payers to allow for the mobilization of healthcare information across organizations and across states as needed. Pennsylvania has local health information initiatives in operation or in the planning stages. The *Connecting Pennsylvanians for Better Health* includes recommendations for Pennsylvania to realize the benefits of healthcare information exchange – it is a long, complex journey, but this report advocates an incremental approach in Pennsylvania in order to build a strong foundation for continued Pennsylvania public/private leadership and the transformation of healthcare.

In order to maintain the momentum established over the past two years and to transition the *Connecting Pennsylvanians for Better Health*, there are immediate activities to be performed. First and foremost is the commitment of dedicated resources to staff PAeHI and to fund its statewide health IT and HIE coordination responsibilities:

1. Identify opportunities for Pennsylvanians to use health IT and HIE to improve healthcare.
2. Educate the public providers and policy makers regarding the benefits and challenges of health IT and HIE.
3. Assist in the coordination of health IT efforts among Pennsylvania healthcare stakeholders.
4. Identify opportunities to coordinate with and benefit from federal initiatives.
5. Develop statewide consensus on established and emerging standards (e.g., data, communication and reporting).
6. Work with providers, payers, policy makers to define business cases (including return on investment) for health IT and HIE.

Other immediate actions that can be performed by the PAeHI include:

- Development of a marketing and education plan for the *Connecting Pennsylvanians for Better Health*
- Creation of a consumer brochure providing information about *Connecting Pennsylvanians for Better Health* and HIE
- Development of resource guides and tools for local HIEs
- Form a task force to study existing Pennsylvania state laws (e.g., privacy, security, medical records, etc.) and make recommendations on needed changes to encourage the widespread adoption of EHRs.
- Coordination with the Commonwealth to develop a Request for Proposal process for local HIE funding

The *Connecting Pennsylvanians for Better Health* report provides the structure and tools to implement the recommendations and deliver success. Success can be defined many ways; however, it can be summarized as the long-term tangible improvements in healthcare quality, safety, and costs through focused, collaborative incremental efforts. Achieving success will be possible with the collaborative contributions and efforts of many PAeHI public and private partners, each with a sense of urgency and commitment to advance health information exchange.

VII. APPENDICES

APPENDIX A: 2006 PAeHI COMMITTEE CHARTERS

2006 PAeHI Business Analysis and Technology Committee Charter

Committee Leadership

Chair: F. Wilson Jackson, M.D., Board Member
Owner, Jackson Gastroenterology

Vice-Chair: Dan Jones, Board Member (Secretary)
Chief Operations Officer, Quality Insights of Pennsylvania

Committee Purpose (Goals)

1. Promote interconnections between healthcare stakeholders to make health information universally and securely available for the benefit of consumers and providers.
2. Endorse statewide interoperability standards consistent with national standards.
3. Develop the business case for electronic medical record (EMR) and health information exchange (HIE) adoption.
4. Identify and evaluate tools and techniques to assist physicians and other healthcare providers in the implementation of electronic medical records and health information exchange.
5. Identify and promote best practices for protecting the privacy of health information.

First-Year Objectives (Deliverables)

1. Inventory EMR and HEI efforts in Pennsylvania with the purpose of assessing stage of development, outcomes and needs for further development.
2. Identify and evaluate EMR and HIE standards for promotion in Pennsylvania.
3. Publish the business case for health information exchange to PAeHI website.
4. Identify and evaluate EMR- and HIE-related products and services that could be provided through, or facilitated by, the Initiative (i.e., secure email communication links for physicians).

Committee Membership

Open to individuals or representatives of organizations dedicated to the Mission and Purpose of the Pennsylvania eHealth Initiative.

2006 PAeHI Communication and Education Committee Charter

Committee Leadership

Chair: Donald F. Wilson, MD, Ex Officio Board Member
Medical Director, Quality Insights of Pennsylvania

Vice-Chair: James M. Walker, M.D., Board Member
Chief Medical Informatics Officer, Geisinger Health System

Committee Purpose (Goals)

1. Educate stakeholders about the benefits of utilizing healthcare information technology (HIT) (including but not limited to EMRs, EHRs, PHRs and registries) and electronic health information exchange (HIE) to provide safer, higher quality care.
2. Develop the capacity and recognition to be the statewide resource for objective, accurate information about HIT.
3. Facilitate broad awareness of locally sponsored initiatives with exchange of ideas leading to a common vision for statewide HIE.
4. Serve as a resource to PAeHI to develop and approve promotional materials and presentations to ensure appropriate quality and consistency.

First-Year Objectives (Deliverables)

1. Organize speakers bureau of qualified individuals willing to discuss benefits of EHR.
2. Prepare and maintain a catalog of power point presentations with talking points about benefits of HIT and role of PAeHI and its sponsored initiatives.
3. Define a process for approving PAeHI promotional materials and presentations.
4. Publish PAeHI newsletter at least quarterly (if budget/resources permit) with information and resources to support the activities of the PAeHI and HIT adoption and HIE in general. Partner with other stakeholders, including information about the PAeHI in their publications where appropriate.
5. Manage PAeHI website assuring useful up-to-date content. Consider online forums.
6. Partner with stakeholders to conduct regional educational seminars on HIT adoption, HIE and the status of RHIO development locally and nationally.
7. Publish a needs-and-readiness survey questionnaire and report to respondents and other stakeholders.
8. Provide a “Consumers Union” on EHR vendors on the PAeHI Website.
9. Create and disseminate press releases when appropriate.

Committee Membership

Open to individuals or representatives of organizations dedicated to the Mission and Purpose of the Pennsylvania eHealth Initiative.

2006 PAeHI Finance Committee Charter

Committee Leadership

Chair: Tom Tabor, Board Member (Treasurer)
Senior Vice President and Chief Information Officer, Highmark Inc.

Vice-Chair: Roger F. Mecum, Board Member
Executive Director, Pennsylvania Medical Society

Committee Purpose (Goals)

1. To provide strategic oversight and direction on issues related to the Initiative's fiscal matters.
2. Secure funding for the Initiative and its sponsored projects.
3. Oversee and review the results of financial audits.
4. Assist in preparation of the Initiative's budget.

First-Year Objectives (Deliverables)

1. Investigate alternatives for the Initiative's future banking requirements and make recommendations to Treasurer and the Board as to how best to address those needs.
2. Identify and investigate possible sources of financial and in-kind support for the Initiative and its sponsored projects.
3. Develop membership dues/financing structure for recommendation to the Board.
4. Coordinate with the Membership Committee on the development and implementation of a dues invoicing system.
5. Assist in the development of policies and procedures to ensure appropriate accounting controls within the Initiative.

Committee Membership

Open to individuals or representatives of organizations dedicated to the Mission and Purpose of the Pennsylvania eHealth Initiative.

2006 PAeHI Membership Committee Charter

Committee Leadership

Chair: Darlene M. Kauffman, Ex Officio Board Member
Associate Director, Payor Relations, Pennsylvania Medical Society

Vice-Chair: Mark Jacobs, Board Member (Vice Chairman)
Director, Information Technology, WellSpan Health

Committee Purpose (Goals)

To coordinate all membership functions including, but not limited to, recruitment, membership processing, member retention and dues collection.

First-Year Objectives (Deliverables)

1. Develop process for membership application and processing for recommendation to the Board.
2. Determine membership classification of prospective members or member organizations.
3. Design membership applications, brochures, and other membership materials.
4. Communicate membership information to initial members and other potential members.
5. Develop dues invoicing system.
6. Create and maintain a current membership e-mail directory as well as a separate directory of other external stakeholders.
7. Maintain membership and committee membership information.

Committee Membership

Open to individuals or representatives of organizations dedicated to the Mission and Purpose of the Pennsylvania eHealth Initiative.

Appendix B: PAeHI Strategic Planning Committee Members

Sharon Abayasekara, RPh, CPL, Holy Spirit Hospital

Patricia L. Bricker, Director of Member Services, PA Academy of Family Physicians & Foundation

Martin J. Ciccocioppo, Vice President, Research, The Hospital & Healthsystem Association of Pennsylvania

Kenneth D. Coburn MD, President, Chief Executive Officer & Medical Officer, Health Quality Partners

Krista Davis, Senior Communications Specialist, Quality Insights of Pennsylvania

Celwyn Evans, Senior Partner, Greencastle Associates Consulting, LLC

Steve Fox, Esquire, Pepper Hamilton LLP

William "Buddy" Gillespie, Vice President and Chief Information Officer, WellSpan Health System

F. Wilson Jackson III MD, Owner, Jackson Gastroenterology

Mark J. Jacobs, MHA, CPHIMS, Director, Information Technology, WellSpan Health

Dan Jones, Chief Operations Officer, Quality Insights of Pennsylvania

Darlene M. Kauffman, Associate Director, Payor Relations, Pennsylvania Medical Society

Patrick Keating, Chief Information Officer, Bureau of Information Technology, Pennsylvania Department of Health

Eric S. Kiehl, Public Affairs Director, Pennsylvania Homecare Association

JoAnn W. Klinedinst, CPHIMS, FHIMSS, PMP, Director, Healthcare Information Systems, Health Information Management Systems Society

Don Levick MD, Physician Liaison Information Services and President Medical Staff Lehigh Valley Hospital

Kelly Lewis, President & CEO, The Technology Council of Central Pennsylvania

Roger F. Mecum, Executive Director, Pennsylvania Medical Society

Rosa Morel, Deputy CIO, Health and Human Services, IT Community of Practice,
Commonwealth of Pennsylvania

Geri Sarfert, Executive Director, Senate Communication and Technology Committee

Carol Shaw, PMP, Health and Human Services Community of Practice, Governor's Office for
Information Technology

Teresa Shuchart, Chief Information Officer, Pennsylvania Department of Public Welfare

Jay Srini, Vice President, Emerging Technology, HIMSS, University of Pittsburgh Medical
Center

Tom Tabor, Senior Vice President and Chief Information Officer, Highmark Inc.

James M. Walker MD, Chief Medical Informatics Officer, Geisinger Health System

Anthony Wilson, Special Assistant to the Secretary of Health, Pennsylvania Department of
Health

Donald F. Wilson MD, Medical Director, Quality Insights of Pennsylvania

Novi Vinod, President, Vinova Health Solutions

APPENDIX C: PRESCRIPTION FOR PENNSYLVANIA

In helping foster HIE, Pennsylvania shares many barriers and challenges with other states but also has unique strengths and opportunities that can be built upon to help ensure success. These include: Vision, Leadership, Landmark Policy and Program Alignment. The state is providing a strong vision, leadership and direction on health information technology as demonstrated by Governor Rendell's appointment of two key technology and policy leaders within the Department of Public Welfare and the Department of Health to serve on the PAeHI Board of Directors. Pennsylvania state government has been a leader in implementing statewide electronic systems:

- Real Time Outbreak and Disease Surveillance (RODS) – Syndromic Surveillance
- PA National Electronic Disease Surveillance System (PA-NEDSS)
- Statewide Immunization Information System (SIIS) – Immunization Registry

Health information technology is an integral element for achieving Governor Rendell's "Prescription for Pennsylvania". By Executive Order, the Governor will establish a Health Technology Commission to complete the following by December 31, 2007:

1. Establish standards and specifications for personal health records and electronic medical records that ensure necessary interoperability;
2. Define components and terminology; and
3. Recommend financial and financing incentives for healthcare providers to purchase these systems.

By September 2008, each acute care facility will, as a condition of licensure, submit a plan, approved by the Department of Health, that sets forth how it will meet the standards and specifications established by the Health Technology Commission, by either adapting existing technology or installing new technology.

By September 2009, the Department of Health will require as a condition of licensure that all acute care facilities will have installed an electronic medical records system compatible with recognized interoperability standards and specifications established by the Health Technology Commission.

The Administration has submitted proposed legislation to the General Assembly to require all healthcare facilities to provide their employees with prescriptive authority easy and timely access to an e-prescribing system that will permit them to write prescriptions electronically and check for potentially harmful drug interactions.

The Administration has submitted proposed legislation to the General Assembly to require the State Board of Medicine to determine the date after which it will require every physician, as a condition of licensure, to use an e-prescribing system to write prescriptions electronically and check for potentially harmful drug interactions.

The Administration will advocate for medical malpractice insurance discounts to be granted to healthcare providers that adopt and use interoperable electronic medical record systems.

***Connecting Pennsylvanians for Better Health* is built on Pennsylvania Strengths, Unique Needs and Experience**

Connecting Pennsylvanians for Better Health fully integrates Pennsylvania's state, regional and local HIE and HIT experiences and fully utilizes the best of breed of other state, local and national practices. The assessment and recommendations are intended as a value-added contribution not only to the Pennsylvania healthcare consumers, providers and payers in the state, but to other states and healthcare communities. This is possible because of: the reliable HIT precedents in Pennsylvania, the intensive two years of groundwork including establishing relations with other states, the National Governors Association (NGA) and at the federal level; the ability to use the experiences in states like Arizona, Indiana, Florida, Michigan and Texas; and the outstanding dedication and commitment by the PAeHI stakeholders. In particular, the unique strengths of the report particularly derive from:

- Catalyzing the stakeholders through a statewide public-private partnership, which is the Pennsylvania eHealth Initiative
- Reliance on dedicated volunteer and professionals who have nurtured the seed of statewide HIT collaboration into a vibrant growing young tree over the past two years
- Collaboration with the HIMSS RHIO Federation and the eHealth Initiative
- Grounding in an explicit framework for incrementally evolving HIE in Pennsylvania

APPENDIX D: HEALTH INFORMATION EXCHANGE PROJECTS IN PENNSYLVANIA

Partial Inventory Pennsylvania Health Information Exchange Activities

AHRQ RHIO Implementation Grant Project

Region Description: Central Pennsylvania

Mission: Exchange health information for common patients across three hospitals

Participants: Geisinger Medical Center, Shamokin Hospital and Bloomsburg Hospital

Funding: AHRQ initial planning grant followed by 3-year implementation grant

Primary Contact: Jim Walker, MD, Chief Medical Information Officer, Geisinger Health System, 570-271-6750, jmwalker@geisinger.edu

Central Pennsylvania Alliance Laboratory (CPAL)

Region Description: Adams, Berks, Dauphin, Lancaster and York counties

Mission: Regional reference laboratory located in York committed to working cooperatively to provide the highest quality and most effective laboratory services to the benefit of patients, providers, health care institutions, laboratories and communities.

Participants: Summit Health System- Chambersburg and Waynesboro Hospitals, Pinnacle Health, Wellspan Health –York and Gettysburg, Ephrata Community Hospital, Lancaster General and The Reading Hospital and Medical Center.

Funding: Hospital and health system operations.

Primary Contact: Lonnie L Ebersole-Administrative Director, 717-851-1426

Central Pennsylvania Health Information Collaborative

Region Description: Forty central Pennsylvania counties

Mission: Health information exchange facilitator

Participants: Six hospitals/health systems and one physician group practice signed MOU

Funding: Undetermined, but leveraging benefits of AHRQ Grant to Geisinger

Primary Contact: Jim Younkin, Epic Program Director, Regional Health Information Exchange, Geisinger Health System, 570-214-9767, jryounkin@geisinger.edu

DuBois Regional Health Information Organization

Region Description: West-Central Pennsylvania

Mission: Hospitals working together on much more than just a RHIO

Participants: DuBois Regional Medical Center, Clearfield Hospital, Brookville Hospital, Elk Regional Hospital, Punxsutawney Area Hospital

Funding: Hospital operations and HRSA grant

Primary Contact: Tom Johnson, MIS Manager, DuBois Regional Medical Center, 814-375-3076, thjohnson@drmc.org

Mercy Circle of Care Exchange Model

Region Description: Mercy Catholic Health System of Southeastern Pennsylvania

Mission: Link Mercy Circle of Care providers through an integrated on-line system

Participants: Mercy Fitzgerald Hospital, Mercy Hospital of Philadelphia, Mercy Home Health, Keystone Mercy Health Plan, Community Behavioral Health, Drexel School of Public Health, University Sciences in Philadelphia.

Funding: Health system operations

Primary Contact: William Bithoney, MD, Mercy Hospital of Philadelphia, 215-748-9789, info@mercyhealth.org

NEPA RHIO

Region Description: Northeast Pennsylvania

Mission: Encourage and assist in the establishment of a regional health data system

Participants: Allied Services, Wyoming Valley Health Care System, Geisinger Wyoming Valley, ES Enterprises Inc., Offset Paperback Mfrs., Northeast Radiation Oncology Center, BCNEPA, Moses Taylor Hospital, Greater Wilkes-Barre Chamber

Funding: Voluntary with in-kind and administrative support from ES Enterprises

Primary Contact: Sabatini Monatesti, Co-chair NEPA RHIO, ES Enterprises Inc., 570-752-8484, smonatesti@pa.metrocast.net

Pennsylvania eHealth Initiative

Region Description: Pennsylvania Statewide

Mission: Neutral, non-profit, educator, convener and collaborator

Participants: Broad Public-Private Coalition

Funding: Voluntary with in-kind and administrative support from QIP, PMS & HAP

Primary Contact: Martin Ciccocioppo, PAeHI Board Chair and Vice President, Research, The Hospital & Healthsystem Association of Pennsylvania, 717-561-5363, martinc@haponline.org

PA National Electronic Disease Surveillance System (PA-NEDSS)

Region Description: Pennsylvania (Statewide)

Mission: PA-NEDSS is the most comprehensive, electronic disease surveillance and case management system in the US. It has won 3 national IT awards.

Participants: PA-NEDSS has approximately 2,000 registered hospitals, labs and physician users and over 700 public health users who access the system on a regular basis. The system receives about 1,000 reports every day and the Department of Health is working on increasing the number of laboratory results reported to PA-NEDSS by interfacing with electronic lab reporting systems.

Funding: Pennsylvania Department of Health

Primary Contact: For more information, contact the Bureau of Health Statistics and Research at 717-783-2548

Philadelphia Health Information Exchange

Region Description: Philadelphia

Mission: Allow region's hospitals and clinics to exchange digital medical records

Participants: Hx Technologies, The Hospital of the University of Pennsylvania, Thomas Jefferson University Hospital, Children's Hospital of Philadelphia, Presbyterian Medical Center, Pennsylvania Hospital, UPHS Community Radiology, Philadelphia Department of Public Health

Funding: National Institutes of Health grant for Interoperability, Portability of EMRs

Primary Contact: Hx Technologies, 215-923-4984, info@hxti.com

Pittsburgh Health Information Network

Region Description: Southwestern Pennsylvania

Mission: Central repository for electronic data on diabetic and depressed patients

Participants: Pittsburgh Regional Healthcare Initiative, QIP, Highmark, Gateway Health Plan, Quest Diagnostics, LabCorp, Premier Medical Assoc., PA Departments of Health and Public Welfare.

Funding: Jewish Healthcare Foundation

Primary Contact: Tania Lyon, Chronic Care Coordinator, Pittsburgh Regional Healthcare Initiative, 412-586-6709, tlyon@prhi.org

Real Time Outbreak and Disease Surveillance (RODS)

Region Description: Pennsylvania Statewide

Mission: Syndromic surveillance system collects emergency department visit information (chief complaint) electronically from hospital emergency departments.

Participants: Approximately 72% of Pennsylvania's general acute care hospitals (approx 168). Over 1,100 stores in PA also send in over the counter pharmaceutical sales data to RODS.

Funding: Pennsylvania Department of Health

Primary Contact: For more information, contact the Bureau of Health Statistics and Research at 717-783-2548

Southern Allegheny Health Resource Alliance

Region Description: South-Central Pennsylvania

Mission: Rural health network to implement an electronic medical record

Participants: Tyrone Hospital, J.C. Blair Memorial Hospital, Nason Hospital, Altoona Hospital

Funding: Hospital operations and HRSA coordination grant

Primary Contact: Steve Gildea, Chief Information Officer, Tyrone Hospital, and Director of Management Information Services, JC Blair Memorial Hospital, 814-684-6399, sgildea@tyronehospital.org

Statewide Immunization Information System (SIIS) – Immunization Registry

Region Description: Pennsylvania Statewide

Mission: SIIS is a voluntary web based immunization registry, which is free of charge to participating providers and is operational 24/7 with technical support. SIIS is a population-based immunization tracking system that developed to aid in achieving complete and timely immunizations for all people, particularly the age group most at risk, birth through two years.

Participants: The registry was initially implemented in the public sector and is now being deployed in private sector. DOH partnered with Highmark to leverage its provider portal. Highmark helps DOH target large volume practices. Highmark recognizes SIIS as a best practice. Provider practices earn quality improvement points. As DOH achieves accelerated progress in Western PA, this becomes model for statewide deployment.

Funding: Pennsylvania Department of Health

Primary Contact: For more information, contact the Bureau of Health Statistics and Research at 717-783-2548

TCCP HL7 Interface Project

Region Description: Greater Harrisburg Area

Mission: Provide for standards-based exchange of clinical information among unrelated health care providers.

Participants: Holy Spirit Hospital, Penn State Hershey Medical Center, Pinnacle Health and Select Medical. Coordination provided by the Technology Council of Central Pennsylvania.

Funding: Unknown.

Primary Contact: Kelly Lewis, President, TCCP, 717-635-2113

Susquehanna Valley Rural Health Partnership

Region Description: North-Central Pennsylvania

Mission: Regional rural integrated electronic information system

Participants: Susquehanna Health System, Bucktail Medical Center, Jersey Shore Hospital, Laurel Health System, North Central AHEC and Lycoming County Medical Society

Funding: Hospital operations and various grants

Primary Contact: Tim Schoener, Administrative Director, Information Technology, Susquehanna Health System, 570-321-2963, tschoener@shscare.org

University of Pittsburgh Medical Center

Region Description: West-Central Pennsylvania

Mission: Electronic medical record and patient/physician portal

Participants: UPMC Health System hospitals

Funding: Hospital operations and various DOD contracts

Primary Contact: G. Daniel Martich, MD, Vice President, eRecord and Associate Chief Medical Officer, UPMC, 724-935-8123, martichdg@mxz.upmc.edu

APPENDIX E: PAeHI RHIO SURVEY SUMMARY

Pennsylvania eHealth Initiative RHIO Survey – Summer 2006

RESPONSE SUMMARY

Total Responses: 15

Are you a member of a RHIO?

9 Yes (60%)

6 No (40%)

When a RHIO Member

70% since 2005

When will your RHIO be implemented?

Most responses planned implementation in 18-24 Months – others have not defined or in process.

Who is in your network?

60% – Providers

40% - Other

What data is shared?

25% Demographics

37% Results

12% Medications

From the comments: 90% respondents were only sharing data within their individual provider information trading arrangement(s) and approximately 10% were working to share information openly with members.

Who is in your RHIO network?

20% Hospitals

20% Clinics & Hospitals

20% Hospitals/Clinics and Insurers

How was the RHIO system financed?

10% Internally

50% Federal Grants

30% State Grants

From the comments: Most respondents were funded or soon-to-be funded RHIOS, some just applied, seeking grants or grants have funded startup costs. Non-funded RHIOs were conducting business by in-kind volunteer efforts. Others did not consider themselves a RHIO.

Was your RHIO Successful?

70% Yes

30% No

Summary of Comments (Paraphrased)

Still in infancy, still evaluating options, where to start, with whom?

All evaluating where they fit and how they can use and share information.

If we participated noted that they:

- Need shared information for physician loyalty to hospital
- Observe and identify opportunities for us as they arise
- Want a complete picture of patient in HIE (Meds, History, Results)
- Create an environment for HIE to benefit our patients.

Community Providers (Hospitals) Responses interested/concerned with:

- Have concern over sharing information outside direct care enterprise
- Want a consumer-centric model
- Web-based - community platform
- Want something to Improve Community Health
- Share patient info between providers/hospitals

Respondents felt RHIOS needed to:

- Position the region for HIE
- Connect healthcare stakeholders in our region
- Patient Safety, Community Focused

Biggest Obstacles:

- Patient Identifier
- Architecture
- Limitation in EMR systems storing information it receives
- Sharing information with physicians on staff
- Cannot visualize a complete model or see this happening soon
- Geographic footprint
- Long-term Sustainable model

APPENDIX F: FINDINGS FROM PAeHI MEMBER PRIORITIES SURVEY

Pennsylvania eHealth Initiative Member Preference Survey Priorities Summary

Opportunity	Level of Importance Ranked 1-4 out of 13	Extremely or Very Important
Electronic Health Record	69%	91%
My Medication History	68%	89%
My Personal Health Record	61%	84%
E-Prescribing	58%	80%
Emergency Information Network	34%	69%
My Health Record Locator	31%	69%
Adverse Drug Event Reporting and Notification	21%	58%
Chronic Disease Monitoring	20%	70%
Quality Monitoring and Reporting	19%	61%
Childhood Immunization Record	19%	59%
My Registration Information	14%	69%
Biosurveillance and Pandemic Surveillance	8%	42%
Employee Empowerment Tool	7%	33%

Technology	Level of Importance	Level of Interest	PAeHI Role Outsourcing/		
	Ranked 1-4 out of 16	High	Advocate/ Facilitator	Tech Partner/ Negotiator	Operator
Interoperability (Context Sharing)	67%	68%	40%	41%	19%
Personal Health Record (PHR)	64%	64%	48%	36%	17%
Connectivity	45%	59%	42%	42%	16%
Patient Portal	44%	69%	52%	33%	15%
Master Person Index and National Provider Index	39%	55%	43%	38%	19%
Clinical Data Repository(s)	35%	65%	52%	31%	17%
Admissions / Discharge/ Transfer (ADT)	33%	38%	53%	34%	14%
Telemedicine	28%	41%	58%	32%	11%
Web Portal Service	24%	59%	46%	39%	16%
Ancillary Systems	20%	83%	47%	33%	19%
Access management (Security Services)	16%	55%	55%	40%	5%
Transaction (Data) Clearing House	16%	47%	44%	39%	18%
Document Imaging	15%	35%	35%	41%	24%
Data Center	4%	34%	34%	45%	21%
Server Platforms	2%	37%	35%	49%	16%
Data Storage	0%	49%	47%	39%	14%

Responses by PAeHI Member Class	Percent
Business	24%
Hospital	19%
Professional Association	15%
Clinician	10%
Quality	9%
Individual	7%
Insurance	6%
Supporting	6%
Government	4%
Consumer	0%

Methodology

Survey conducted via email solicitation of PAeHI Contact data base between January
 Survey responses were collected via the Internet using SurveyMonkey.

Total Responses = 70.

APPENDIX G: MEDICAL TRADING AREA ANALYSIS

Introduction to Medical Trading Area Analysis

This analysis can be started with simple charts, graphs and maps. Those from discharge analysis and other tools should be used, such as the information in the Dartmouth Atlas. Many of the areas would resemble the federal government's definition of metropolitan statistical areas but will go beyond those areas where there is an established pattern of healthcare services provided to patients outside the metro area or where there is a significant non-metro population grouping not yet defined as a metro area.

The following items are the recommended building blocks and minimums to help define regions and should be used as criteria when issuing state funding. The quantitative numbers that follow are not absolute, but are meant to be a guide when reviewing applications for funding. The building blocks/minimums listed below were selected based upon many other general assumptions.

Qualitative Building Blocks:

- Recommended Planning Elements:
 - There should be flexibility for inclusion in the Medical Trading Areas. They should be inclusive, not exclusive. Providers may need to be in more than one medical trading area.
 - The Medical Trading Areas must work for the providers to improve efficiency and quality.
 - What is best for the provider will ultimately be best for the patient.
 - The providers should drive the Medical Trading Areas and shape them.
 - Being involved in the Medical Trading Area should give organizations a competitive edge, but not create a competitive edge over another organization also involved.
 - There must be flexibility because different areas will have different approaches to healthcare based on culture.

- Recommended Implementation Elements of a Local Exchange:
 - The technical infrastructure for each area should include a central switch to send and receive data. There should be technical hardware, such as Internet access, facilities and infrastructure as well as a standard patient identification system and consistent data.
 - The “what” and “how” of this should be a state role, especially in setting standards, assuring transferability between Medical Trading Areas, and fitting in with federal standards that may emerge.
 - It must be treated as a unique entity with a sustainable business model.
 - Decisions on services to be offered should be based upon market and pricing/cost in that market.

Quantitative Building Blocks:

- **Planning Minimums:**
 - Average Minimum Population Size: 250,000 people
 - Minimum Percentage of Services: 3 or more separate organizations representing at least 60% of Hospital Discharges, 50% of lab work, and 50% of the data in at least 3 other categories listed above.

- **Implementation of a Local Exchange Minimums:**
 - Average Minimum Population Size: 500,000 people
 - Minimum Percentage of Services: 3 or more separate organizations representing 70% of the hospital discharges, 60% of lab results and 60% of 3 other categories from above.

APPENDIX H: GLOSSARY

Adapted from the Arizona Health-e Connection Roadmap, April 4, 2006 and Health Information Technology Glossary www.wcit2006.org/Healthcare/glossary.html

ANSI – American National Standards Institute - The U.S. standards organization that establishes procedures for the development and coordination of voluntary American National Standards.

ASTM International – American Society for Testing and Materials – was formed over a century ago, when a forward-thinking group of engineers and scientists got together to address frequent rail breaks in the burgeoning railroad industry. Standards developed at ASTM are the work of over 30,000 ASTM members. These technical experts represent producers, users, consumers, government and academia from over 100 countries. Participation in ASTM International is open to all with a material interest, anywhere in the world. www.astm.org

Application Service Provider (ASP) – A business that provides access to one or more software applications, typically from a hosted environment over a network to its customers.

Broadband – The ability of a user to view content across the Internet to include large files, such as video, audio and three-dimensional. A user's broadband capability is typically governed by the connection between the Internet service provider (ISP) and the user.

Certification Commission for Healthcare Information Technology (CCHIT) – An organization dedicated to accelerating the adoption of interoperable health information technology throughout the US healthcare system by certifying HIT products.

Clinical Document Architecture (CDA) – Provides an exchange model for clinical documents and brings the industry closer to the realization of an electronic medical record. The CDA was expected to be published by the end of 2006 as a nationally accepted standard.

Computerized Provider Order Entry (CPOE) – A computer application that allows a physician's orders for diagnostic and treatment services, such as medications, laboratory, and other tests, to be entered electronically instead of being recorded on order sheets or prescription pads. The computer compares the order against standards for dosing, checks for allergies or interactions with other medications, and warns the physician about potential problems.

Consolidated Health Informatics Initiative (CHI) – One of the 24 Presidential eGovernment initiatives with the goal of adopting vocabulary and messaging standards to facilitate communication of clinical information across the federal health enterprise.

Continuity of Care Record (CCR) – A standard specification being developed jointly by ASTM International, the Massachusetts Medical Society (MMS), the Health Information Management and Systems Society (HIMSS), the American Academy of Family Physicians (AAFP), and the American Academy of Pediatrics. It is intended to foster and improve continuity of patient care, to reduce medical errors, and to assure at least a minimum standard of health information transportability when a patient is referred or transferred to, or is otherwise

seen by, another provider. The origins of the CCR stem from a Massachusetts Department of Public Health, three-page, NCR paper-based Patient Care Referral Form that has been in widespread use for many years in Massachusetts, and from other minimal data sets both electronic and paper-based. The CCR is being developed and enhanced in response to the need to organize a set of basic patient information consisting of the most relevant and timely facts about a patient's condition. Briefly, these include diagnoses, recent procedures, allergies, medications, recent care provided, as well as recommendations for future care (care plan) and the reason for referral or transfer. The CCR will be created by a healthcare provider/clinician at the end of an encounter, or at the end of an episode of care, such as a hospital or rehabilitation stay.

www.massmed.org/pages/ccrfaq.asp

Decision-Support System (DSS) – Computer tools or applications to assist physicians in clinical decisions by providing evidence-based knowledge in the context of patient-specific data. Examples include drug interaction alerts at the time medication is prescribed and reminders for specific guideline-based interventions during the care of patients with chronic disease. Information should be presented in a patient-centric view of individual care and also in a population or aggregate view to support population management and quality improvement.

Document Consumer – The vendor, who receives information, views the document; imports and stores the document for later viewing and imports specific patient information, such as test results or medication lists (senders are dubbed "Document Sources").

eHealth Initiative (eHI) – The eHealth Initiative and the Foundation for eHealth Initiative are independent, non-profit affiliated organizations whose missions are the same: to drive improvement in the quality, safety, and efficiency of healthcare through information and information technology.

Electronic Health Record (EHR) – A real-time patient health record with decision support capabilities that can be used to aid clinical decision-making. The EHR can also support the collection of data for uses other than clinical care, to include billing, quality management, outcome reporting and public health surveillance and reporting.

Electronic Medical Record (EMR) – An EMR is an electronic record containing information about a patient with the ability to communicate with other applications within a health enterprise (hospital, clinic, physician practice). An EMR belongs to and is owned by the hospital/practice/clinic that provides the patient with medical care.

Enterprise Architecture – A strategic resource that aligns business and technology, leverages shared assets, builds internal and external partnerships, and optimizes the value of information technology services.

e-Prescribing – Computer technology in which physicians use handheld or personal computer devices to review drug and formulary coverage and transmit prescriptions to a printer, EMR or pharmacy. e-Prescribing software can be integrated with existing clinical information systems to allow access to patient-specific information to screen for drug interactions and allergies.

Federal Health Architecture (FHA) – A collaborative body composed of several Federal departments and agencies, including the Department of Health and Human Services (HHS), the Department of Homeland Security (DHS), the Department of Veterans Affairs (VA), the Environmental Protection Agency (EPA), the United States Department of Agriculture (USDA), the Department of Defense (DOD), and the Department of Energy (DOE). FHA provides a framework for linking health business processes to technology solutions and standards, and for demonstrating how these solutions achieve improved health performance outcomes.

Health Information Exchange (HIE) – The movement of healthcare information electronically across organizations within a region or community. HIE provides the capability to electronically move clinical information between disparate healthcare information systems while maintaining the meaning of the information being exchanged. The goal of HIE is to facilitate access to and retrieval of clinical data to provide safe, timely, efficient, effective, equitable, patient-centered care.

Health Information Technology (HIT) – The use of computer software and hardware to process healthcare information electronically, thereby allowing for the storage, retrieval, sharing and use of the information, data and knowledge for communication and decision-making related to patient care delivery.

Health Insurance Portability and Accountability Act (HIPAA) – A law enacted in 1996 to first protect health insurance coverage for workers and their families when they change or lose their jobs and secondly requires the establishment of national standards for electronic healthcare transactions and national identifiers for providers, health insurance plans and employers.

Health Level Seven (HL7) – One of several accredited standards (specifications or protocols) established by the American National Standards Institute (ANSI) for clinical and administrative data. Systems which are HL7 ‘compliant’ improve the ability for interoperability and exchange of electronic data.

Informatics or Information Science – The study of information. It is often, though not exclusively, studied as a branch of Computer Science and Information Technology (IT) and is related to database, ontology and software engineering. Informatics is primarily concerned with the structure, creation, management, storage, retrieval, dissemination and transfer of information. Informatics also includes studying the application of information in organizations, on its usage and the interaction between people, organizations and information systems.

Interoperability – The ability of a system or a product to work with other systems or products without special effort on the part of the customer.

Local Health Information Infrastructure (LHII) – A term used synonymously with RHIO. LHII was originally termed by the Office of the National Coordinator of Health Information Technology (ONCHIT) to describe the local efforts that will eventually be linked together to form NHII (National Health Information Infrastructure).

Master Patient Index (MPI) – A software database program that collects a patient's identification numbers (from lab, radiology, admitting, etc.) and keeps them under a single, enterprise-wide identification number.

Medical Trading Area (MTA) – A geographically-defined area where a population receives medical services. The area typically includes groups of physicians, hospitals, laboratories, and other providers offering healthcare services.

National Health Information Network (NHIN) – describes the technologies, standards, laws, policies, programs and practices that enable health information to be shared among health decision makers, including consumers and patients, to promote improvements in health and healthcare. The development of a vision for the NHIN began more than a decade ago with publication of an Institute of Medicine report, "The Computer-Based Patient Record." The path to a national network of healthcare information is through the successful establishment of RHIO.

National Health Information Infrastructure (NHII) – is often used synonymously with NHIN. NHII came before NHIN and is an acronym that encompasses all of the necessary components needed to make EHRs interoperable. NHIN, as the name suggests, refers to both the physical and national network needed for interoperability to occur.

Normalization – The process of redefining clinical data based on predefined rules. The values are redefined based on a specific formula or technique.

Office of the National Coordinator for Health Information Technology (ONC) – The US Department of Health and Human Services office, established in 2004, to provide leadership for the development and nationwide implementation of an interoperable health information infrastructure.

Patient Record Locator – The electronic means by which patient files are located to assist patients and clinicians find test results, medical history, prescription data and other health information. A record locator would act as a secure health information search tool.

Personal Health Information Technology (PHIT) – Enables the documentation of an individual's complete, lifelong health and medical history into a private, secure and standardized format that he or she owns and controls, but yet is accessible to legitimate providers day or night from any location.

Personal Health Record (PHR) – A software application which individuals can use to maintain and manage their health information (and that of others if authorized) in a private, secure and confidential environment.

Practice Management System (PMR) – That portion of the medical office record which contains financial, demographic and non-medical information about patients.

Results Delivery Service – A service which delivers clinical results from labs to the ordering clinician in the formats they require. Examples of results include blood tests, pathology reports, radiology results and reports.

Regional Health Information Organization (RHIO) – A multi-stakeholder organization responsible for motivating and causing integration and information exchange. Overall, RHIOs intend to improve the safety, quality and efficiency of healthcare as well as access to healthcare as a result of health information technology.