The Commonwealth of Massachusetts 2010 Health Information Technology Strategic Plan

Presented by:

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1. Executive Summary

It is likely that at some point in each of our lives, we have visited a healthcare provider and seen opportunities for improvement. In some cases the opportunity could be straightforward, such as a prescription electronically delivered directly to the pharmacy rather than a hard-to-read, handwritten prescription we had to deliver ourselves. At other times we might have found ourselves wondering why it was so hard to get a copy of our medical records to take to a visit with a new doctor. At each step along our journey through the health care system, we have probably seen opportunities for insurance companies, physicians, clinicians, hospitals and long term care facilities to work together, collaboratively, to improve our health and our experience. Although each person's journey to better health is different, many of the challenges accessing quality, safe health care services are the same. The lack of coordinated, shared information creates inefficiencies, which contribute to reduced quality of care and to higher costs. Each year, these inefficiencies result in patients paying higher insurance premiums and the need to devote an ever greater portion of tax dollars towards funding our health care system.

As momentum increases across the nation to reform the health care system, Massachusetts is once again a leader in innovation. In 2006, Massachusetts began its efforts to achieve universal health insurance coverage for its citizens, and by 2009, nearly 97% of Massachusetts residents were insured. Along this path to health care reform, the Commonwealth recognized the critical role Health Information Technology (Health IT) can play in supporting healthcare reform initiatives. This recognition was confirmed with the state legislature's passage of Chapter 305 in 2008 and in the 2009 recommendations of the Health Care Quality and Cost Council.[1] Chapter 305 promotes cost containment, transparency and efficiency in the delivery of quality health care, and includes a goal to implement Electronic Health Records (EHR) in all provider settings by the end of 2014. In further support of advancing Health IT in Massachusetts, Chapter 305 also created the Massachusetts eHealth Institute (MeHI), a division of the Massachusetts Technology Collaborative, which is overseen by the Health Information Technology Council (the Council). MeHI is responsible for coordinating EHR initiatives and Health Information Exchange (HIE) technologies in the Commonwealth.

At the federal level, the Health Information Technology for Economic and Clinical Health (HITECH) Act was enacted in February 2009, as part of the American Recovery and Reinvestment Act (ARRA). The HITECH Act provides direct incentives to physicians, other prescribing clinicians and short-stay hospitals to implement EHRs (achieving "meaningful use"), and increases the privacy and security requirements associated with the management of electronically stored data.

The importance of Health IT in supporting safer, higher quality, more efficient health care is recognized by many, including national organizations, such as the Institute of Medicine.[2] Despite this general agreement that Health IT has the potential to become a critical enabler of improved health care quality and health reform, fewer than half of Massachusetts' physicians have implemented certified Health IT technologies in their offices. Even fewer of those have incorporated Health IT into their daily work, in such a way, as to reliably demonstrate improved health outcomes for their patients. For those who have implemented Health IT to improve care delivery, much of the potentially life-saving patient health information is still stored in silos, largely inaccessible to patients, as they travel along their journey to better health.

[1] Massachusetts Health Care Quality and Cost Council, "Roadmap to Cost Containment, Final Report", October 23, 2009.

[2] Committee on Quality of Health Care in America, Institute of Medicine, "Crossing the Quality Chasm: A New Health System for the 21st Century", Washington DC: National Academy Press; (2001).

The Commonwealth has set a vision for the development and implementation of Health IT-related programs in the state. This vision is encompassed in four overarching goals, which will be achieved through the implementation of a set of strategies. Key components of this strategic framework are summarized here, with additional detail in chapters 2 through 8 of this document.

1.1. Strategic Framework to Achieve Vision, Goals and Objectives

The Commonwealth has organized its Health IT strategic plan using the following strategic framework:

1. Vision of Health Information Technology
2. Health IT Strategic Plan Goals and Objectives
3. Strategies to Achieve Health IT-Related Goals and Objectives

1.2. The Vision of Health Information Technology

As a result of healthcare reform and statewide deployment and adoption of Health Information Technology (Health IT), the Commonwealth of Massachusetts will benefit from, and be recognized for, a significantly healthier population, with measurable improvements demonstrated in health care costs, quality, safety and efficiency. Every resident in the state will have access to the highest quality care and to providers, who are supported in their efforts to deliver safe, equitable, affordable, coordinated care. Widespread implementation and adoption of Health IT will give health care providers access to electronic medical records that are interoperable and to health information exchanges that allow them to share key information about their patients in a secure manner. This will also reduce medical errors and provide a platform for enhanced coordination of care.

Armed with information from multiple sources, patients will be in better control of their own health and health related services. They will have access to their protected health information through a secure web-based interface, and with the patient's permission, providers will be able to access real-time health information from all providers involved in their care.

Health IT will support an integrated system and promote improvements in health care quality and safety. To manage and maintain this system, a Health IT workforce that is skilled and knowledgeable in advancing all aspects of Health IT adoption and sophistication will be available to providers and employers.

Achieving this vision will require a shift in the way all participants in the health care system interact with each other. A Health IT enabled system will support virtual care – provider/patient interaction, wherever a patient might be – with information coming from disparate sources, such as home monitoring devices, registries, other clinicians and providers, and research trials. Health IT supported administrative transactions will decrease administrative burdens for the providers, patients and payers. Finally, information will be easily, securely and reliably available to better understand public heath needs and trends, to support public health interventions and programs, and be available to support research and emergency response efforts.

It is understood that payment reforms, greater accountability for the costs and quality of healthcare, privacy protection and more efficient technologies will also be necessary to achieve this vision. The intent of this strategic plan is to lay the Health IT foundation for these changes to occur.

1.3. Health IT Strategic Plan Goals and Objectives

Goal 1: Improve access to comprehensive, coordinated, person-focused health care through widespread provider adoption and meaningful use of certified EHRs.

Objectives

- Equitably increase the number of providers who can demonstrate meaningful use of interoperable EHRs across all service areas, including rural, suburban and urban areas where health disparities have been identified.
- Assure private and secure electronic access, use and portability of protected health information by all authorized individuals.
- Increase the number of patients whose care is coordinated across disparate delivery systems within the state and across state boundaries.

Goal 2: Demonstrably improve the quality and safety of health care across all providers, through Health IT that enables better coordinated care, provides useful evidence-based decision support applications, and can report data elements to support quality measurement.

Objectives

- Equitably increase the number of ambulatory primary care providers that have re-engineered their care processes, to better manage chronic conditions, through adoption of patient centered medical home processes and Health IT that supports evidence based care.
- Adopt and promulgate a common set of Health IT enabled quality and safety measures across all payers and providers.
- Adopt meaningful use measures, as defined by the federal government, for reporting purposes across all agencies.
- Leverage existing reporting infrastructure, when appropriate.
- Commit to the principles that hospitals and health care providers would report quality and safety measures one way, one time and to one place, to ensure they are collected consistently and with minimum administrative burden.
- Over time, track and improve quality and safety measures reported from EHRs.

Goal 3: Slow the growth of health care spending through efficiencies realized through the use of Health IT.

Objectives

- All payers in the Commonwealth will adopt a single set of Federal standards for eligibility and claims payment processes, which will be incorporated into certified EHRs.
- Over time, decrease standardized measures of administrative costs for both payers and providers.
- Patients report more timely, effective and appropriate care, both virtual and face to face.
- Decrease redundant testing.
- Document, track and minimize episodes of futile care.
- Engage patients to actively participate in managing their health information, their health and their care, and encourage providers to engage with and respond to their patients.

Goal 4: Improve the health of the Commonwealth's population through public health programs, research and quality improvement efforts, enabled through an efficient, accurate, reliable and secure health information exchange processes.

Objectives

- Efficiently track and demonstrate improvement in the Commonwealth's key public health initiatives to improve the health of its population, leveraging both local and state Departments of Public Health.
- Support health reform in the Commonwealth, by providing ready access to data and information that is necessary for identification and implementation of key reform policies and strategies, being meticulous about protecting patient information and carefully following the minimum necessary use of information standards.
- Develop and promote effective and accessible disease prevention, health and wellness programs.

1.4. Strategies to Achieve Goals and Objectives

The Commonwealth of Massachusetts understands that achieving these goals and objectives will require pursuit of a core set of strategies (Chapters 3 through 8), to ensure that all health care stakeholders move forward together in support of the Commonwealth's common vision. The following six strategies are critical to achieving Health IT related goals and objectives.

Strategy 1: Establish Multi-Stakeholder Governance. The Commonwealth's Health IT initiative will be governed through a public-private partnership that will foster close and effective collaboration between the public and private sectors. This governance model recognizes and builds on the many contributions the private sector has made to advance Health IT in Massachusetts. The governance model will further uphold the public's trust through transparent (publicly posted, easily understood and readily available) and effective use of public funds.

Strategy 2: Establish a Privacy Framework to Guide the Development of a Secure Health IT Environment. The Commonwealth will develop a privacy and security framework, such that consumers will understand who will use their health information and how, will have control over its use, and the information is always protected from unauthorized access and used only for authorized purposes. Sanctions and remedies for breaches of information will be incorporated into the framework to motivate everyone to participate responsibly.

Strategy 3: Implement Interoperable Health Records in all Clinical Settings and Assure they are used to Optimize Care. The Commonwealth will promote the adoption of EHRs in all clinical settings to improve access to health-information by patients and providers.

Strategy 4: Develop and Implement a Statewide Health Information Exchange (HIE) Infrastructure to Support Care Coordination, Patient Engagement and Population Health Improvement. The Commonwealth will work with the private sector to leverage current capabilities and develop an electronic reporting infrastructure, to support a future health care system capable of simultaneously improving the quality of care provided to all Commonwealth residents and reducing the cost of that care. The state's intent is to collaborate with the private sector, building on the efforts already underway.

Strategy 5: Create a Local Workforce to Support Health IT Related Initiatives. Implementation of Health IT on the scale required in the Commonwealth of Massachusetts will require people with skill sets that are in demand both inside and outside the state. The Commonwealth will help to advance and increase the number of training programs to deliver the number of graduates that will be required to support achievement of our Health IT vision.

Strategy 6: Monitor Success. While the governance of this initiative has been designed to maximize transparency and public/private collaboration, a comprehensive set of measures and monitoring programs will be required to ensure that residents of Massachusetts achieve the full benefits of Health IT.

1.5. Conclusion

Effective use of Health IT is widely believed to have the potential to improve the quality and coordination of healthcare and reduce costs. The Commonwealth's vision, goals and supporting strategies provide the foundation and structure needed to realize the full benefits of Health IT and ultimately improve quality of care, and increase safety and efficiency. As the Commonwealth executes the strategies and activities in this plan, MeHI will identify areas where Health IT is having a positive or negative effect, learn from those experiences, and create a health care system that continuously learns and improves over time.

Health IT will be critical for changing the way health care is delivered in the Commonwealth. As national health care reform continues to evolve, the Commonwealth will work hard to provide access to quality health care for all residents, and will leverage Health IT to the fullest extent possible, to ensure the system provides the greatest value to the Commonwealth's residents.

2. Introduction

The Commonwealth of Massachusetts strives to continually improve the health of its residents. This is evidenced by its continuous efforts to lead and develop innovative health care quality and reform initiatives. With the passage of Comprehensive Health Reform in 2006, Massachusetts pioneered the implementation of a reform to expand affordable health care to all its residents. In doing so, it became the first state in the country to acknowledge that "access to health care is a basic human right." However, health care costs continue to rise, and there is a critical need for significant improvements in the quality and cost of health care. Health Information Technology (Health IT) is a key enabler to improving the delivery of health care services. When incorporated into the broader health care process, Health IT systems can potentially enable reduction in health care costs, while improving its quality. The Institute of Medicine (IOM) has long supported the concept that the secure and interoperable exchange of health information is one of the few interventions that can accelerate and support improvements in the Institute of Medicine's six aims of quality (efficiency, safety of health care, effectiveness, timeliness, patient-centricity and equitability).[3]

Despite the growing national push toward adoption of Health IT, the Massachusetts eHealth Institute (MeHI) estimates that today in the Commonwealth of Massachusetts, only 40% of physicians are using EHRs in their offices or clinical settings[4]. In addition, MeHI found that most hospitals in the Commonwealth are not using Health IT to its full capacity, as defined by evolving federal guidelines[5] – only 48% are using CPOE. While some providers (physicians, dentists, and other clinicians who serve patients) are using Health Information Exchanges (HIE) to promote patient-centric care across organizations, most residents in Massachusetts are not currently able to benefit from this type of information sharing.

For the Commonwealth to continue to address inefficiencies in its health care system, health information technology needs to be further deployed and adopted by the state's providers, many of whom are still using paper medical records. A recent study published in the Archives of Internal Medicine indicates that hospitals using computerized notes and records have the potential to save 100,000 lives annually.[6] Other industries, such as banking, retail and travel have been quicker than health care to use information technology to increase flexibility and efficiency, and to improve consumer satisfaction. Reasons for this disparity are varied, but certainly the nature and complexity of the healthcare system and the sensitivity of the information it contains, are important. In addition, in the financial industry, there is a strong "framework of rules that limits access to data, punishes those who violate the laws, and compensates individuals who suffer financial harm because their information is inappropriately accessed.[7]

Health IT encompasses a broad set of technologies that securely manage, store and/or exchange standardized health information. These technologies improve the reliability and timeliness of sharing critical health information, within the health care delivery system, and alleviate the need to store much of

[3] Committee on Quality of Health Care in America, Institute of Medicine, 2001. *Crossing the Quality Chasm: A New Health System for the 21st Century*, Washington DC: National Academy Press.

[4] Simon et al., 2009, Physicians' Usage of Key Functions in Electronic Health Records from 2005-2007. Journal of the American Medical Informatics Association

[5]. Based on a recent MeHI study – Estimated Costs to Achieve Meaningful Use of Certified EHRs in Massachusetts Hospitals – Results from Spring 2009 Survey.

[6] Amarasingham, et al, January 2009. Clinical Information Technologies and Inpatient Outcomes: A multiple hospital study. Archives of Internal Medicine.

[7] Deven McGraw, Center for Democracy and Technology, January 2009. *Rethinking the Role of Consent in Protecting Health Information Privacy,* p.7.

that information in a paper format. The following two key Health IT terms are used throughout this document and are defined according to the National Alliance for Health Information Technology (NAHIT).

- **Electronic Health Record (EHR):** An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinicians, consumers and staff across more than one health care organization.
- **Health Information Exchange (HIE):** The electronic movement of health-related information among organizations according to nationally recognized standards for the purpose of improving the accuracy, efficiency, timeliness and breadth of public health and quality reporting. HIE, when used as a noun, often refers to the technical infrastructure supporting the exchange of health information across more than one health care organization.

Appendix A contains a full list of key Health IT terms and acronyms used throughout this document.

2.1. Chapter 305 and HITECH Act

Chapter 305: In August 2008, the Massachusetts legislature enacted and the Governor signed Chapter 305 of the Acts of 2008. The Act to "Promote Cost Containment, Transparency and Efficiency in the Delivery of Quality Health Care" recognized that deploying Health IT is imperative to supporting real health care reform in the Commonwealth. Chapter 305 of the Act addresses cost and quality issues, along with the implementation of Massachusetts's health care access reform by doing the following:

- Setting the goal of implementing EHR systems in all provider settings and integrating those systems through a robust HIE, by January 1, 2015
- Creating the Massachusetts eHealth Institute (MeHI), a division of the Massachusetts Technology Collaborative and overseen by the Health Information Technology Council (the "Council"), to coordinate public and private initiatives, in support of the statewide deployment of EHR and HIE technologies
- Using Implementation and Optimization Organizations (IOO) to support deployment of EHRs and establishment of state-wide HIE
- Specifying that consent for sharing information through statewide HIE be designed to protect patient privacy and information security, including the patient's choice to participate in sharing their information through HIE at any time
- Directing the implementation and dissemination of EHRs to include providers that care for underserved populations, including but not limited to, racial, ethnic and linguistic minorities, uninsured persons, and areas with a high proportion of public payer care.

HITECH Act: At the federal level, in February of 2009 President Obama signed the Health Information Technology for Economic and Clinical Health (HITECH) Act, part of the American Recovery and Reinvestment Act (ARRA). The HITECH Act provides direct incentives to physicians, other outpatient providers and short-stay hospitals to implement interoperable EHRs (achieving "meaningful use"). It also increases the privacy and security requirements associated with the management of data stored electronically in Health IT systems. The "meaningful use" criteria promote the use of certified EHRs that securely manage health-related information and have certain features that promise to improve the safety of care. The criteria also encourage providers to submit clinical quality measures and public health data electronically, enabling greater participation in HIE programs and quality reporting initiatives.

As a result of the centralized structure created by Chapter 305 (MeHI and Health IT Council), MeHI was designated by the Governor as the State agency to receive HITECH funding under the State Health

Information Exchange Cooperative Agreement Program and to serve as the single Regional Extension Center (REC) for the entire Commonwealth. These two programs are discussed in greater detail in Chapter 3.

2.2. Brief History of Health IT in the Commonwealth

Chapter 305 and the planned efforts of MeHI and the Health IT Council are designed to build upon Massachusetts' long history of initiatives in the quality improvement and Health IT arenas. One of the foundational pioneering efforts for Health IT was the creation of the Massachusetts Health Data Consortium (MHDC) in 1978, as a non-profit coalition of a wide range of public and private stakeholders that sought to address health information needs and improve health care in the Commonwealth. In its early years, it embarked on data sharing initiatives, released hospital surgical use and variation studies, and created an online inpatient database. It also announced efforts to create a virtual network for moving, storing and sharing patient information. Between 2006 and 2009, MHDC was designated by successive State Administrations as the convening and coordinating entity for the Federal government's Health Information Security and Privacy Collaboration (HISPC) project. Participation from well over 100 contributors across the entire stakeholder continuum made this State's HISPC project a success.

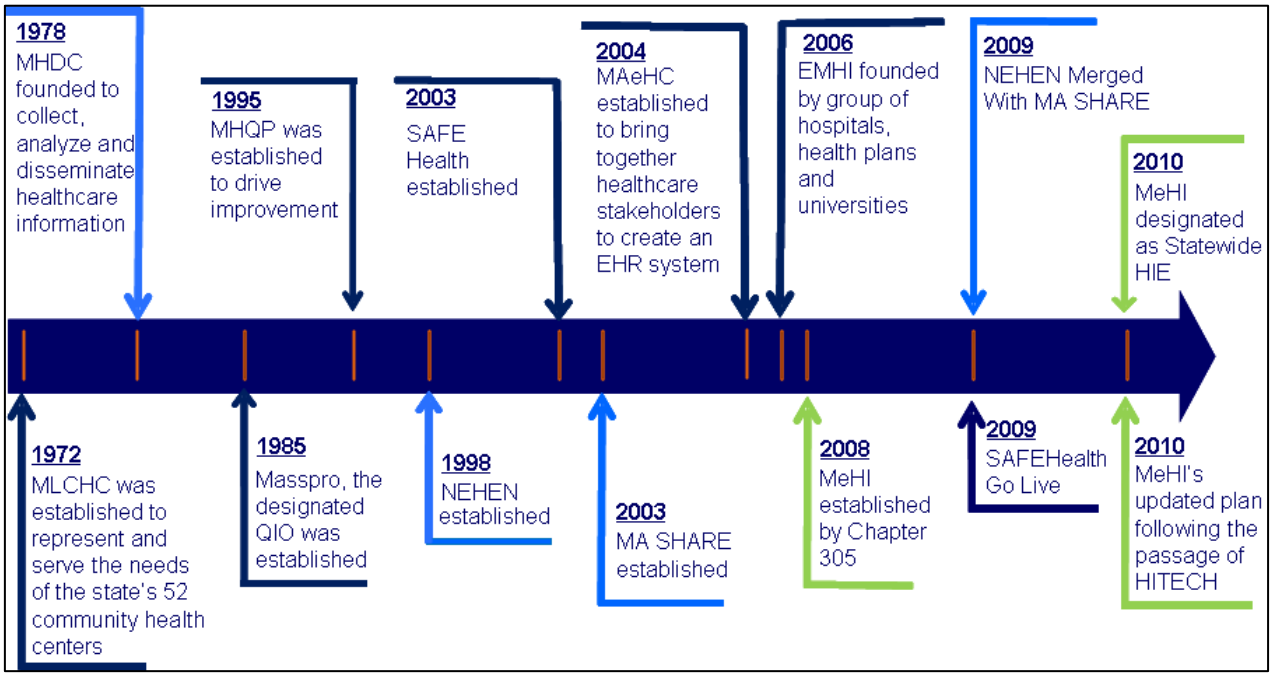

Figure 2.1: History of Health IT Timeline

Other eqully important efforts include the following:

1972 – The Massachusetts League of Community Health Centers (MLCHC) is established. MLCHC is a non-profit, statewide association that represents and serves the needs of the state's 52 community health centers. It serves as an information source on community-based health care to policymakers, opinion leaders and the media, and provides technical assistance for Health IT adoption to its members and communities. [8]

1985 – Masspro was established as the CMS designated Quality Improvement Organization in Massachusetts.

1995 – The Massachusetts Health Quality Partners (MHQP) was established by a group of Massachusetts health care leaders who identified the importance of valid, comparable measures to drive improvement. MHQP is a broad-based coalition of physicians, hospitals, health plans, purchasers, consumers, academics and government agencies working together to promote improvement in the quality of health care services in Massachusetts.[9]

1998 – A feasibility study for implementing an electronic data interchange (EDI) in 1997 led to the creation of the New England Healthcare EDI Network (NEHEN) in 1998. NEHEN provides an all-payer, all-provider solution to integrate administrative transactions, focused specifically on EDI, and also facilitates the sharing of development costs. The successful collaboration of stakeholders through MHDC fostered an effective operational and governance model in NEHEN.

2003 – MHDC facilitated the creation of MA-SHARE (Simplifying Healthcare among Regional Entities), to promote a healthcare data exchange, using information technology, standards and administrative simplification.

2003 – SAFE Health (Secure Architecture for Exchanging Health Information), a consent-enabled Health Information Exchange currently operational in central Massachusetts, was conceived by the leading healthcare organizations in Central Massachusetts, who have a history of partnerships and collaboration. With the consent of patients, clinical information follows the patient as they seek care from different healthcare providers.[10]

2004 – Funded by a grant of $50 million from Blue Cross Blue Shield of Massachusetts, a broad-based collaboration of key stakeholders - the Massachusetts eHealth Collaborative (MAeHC) - engaged physician practices and hospitals in the EHR adoption and HIE process in three communities: Newburyport, Brocton and North Adams. Physicians in these communities can now submit quality data via HL7 2.x messaging and web services transport into a quality warehouse operated by MAeHC and hosted at the Massachusetts Medical Society.

2005 –Masspro contributed to the development of CMS' Doctor Office Quality – IT (DOQ_IT) program and, to improve care over the course of three years, supported 450 MDs in the Commonwealth, through the adoption and effective use of Electronic Health Records.

2006 - The Eastern Massachusetts Healthcare Initiative (EMHI) was founded by a group of hospitals, health plans and universities to explore the possibility of working together to improve the performance of the region's healthcare system through health information exchange.

2008 – In support of advancing Health IT in Massachusetts, Chapter 305 created the Massachusetts eHealth Institute (MeHI), a division of the Massachusetts Technology Collaborative. MeHI is responsible

[8] Massachusetts League of Community Health Centers, http://www.massleague.org/About/MissionAndRole.php, 2010.
[9] Massachusetts Health Quality Partners, http://www.mhqp.org/aboutus/AboutUs.asp?nav=020000, 2010.
[10] Safe Health, http://safehealth.org, 2010.

for coordinating EHR initiatives and Health Information Exchange (HIE) technologies in the Commonwealth.

2009 – NEHEN and MA-SHARE merged into a single organization with the goal of providing HIE for both administrative and clinical data, as well as services to aggregate quality outcomes measures. The two organizations shared common architecture, infrastructure and support services; overlap in leadership and governance made collaboration natural.[11]

2.3. Benefits of Health IT

The full deployment and adoption of Health IT will provide critical infrastructure for advancing improvements in the quality, safety and efficiency of health care. In 2005, the RAND Corporation analyzed the potential benefits of nationwide Health IT adoption. Extrapolating the study's findings to Massachusetts, Health IT adoption could save $1.76 billion per year through medical and administrative savings.[12] Of equal importance to any cost savings are the benefits of Health IT to individuals in the health care system, including the following (see chapter 8 Monitoring Success, page 58, for more details):

- **Improved Quality of Care:** Through clinical decision support, better coordinated care, and improved and equitable patient access to their provider and to their own health-related information, Health IT has great potential to enable patients and providers to collaborate more effectively to better manage health, and acute and chronic diseases.
- **Increased Safety:** Health IT can reduce errors of patient care through decision support, legibility and timely access to health information, for the provider and patient alike.
- **Increased Efficiency:** As a result from automating manual processes, all health care stakeholders (patients, providers, payers, government, etc.) will benefit from decreased costs, and administrative simplification and streamlining.

2.4. Strategic Framework to Achieve the Commonwealth's Health IT-Related Vision, Goals and Objectives

The Commonwealth has organized its Health IT strategic plan using the following strategic framework:

1. Vision of Health Information Technology
2. Health IT Strategic Plan Goals and Objectives
3. Strategies to Achieve Health IT-Related Goals and Objectives

2.4.1. Vision of Health Information Technology

The year is 2015. As a result of healthcare reform and statewide deployment and adoption of Health IT, the Commonwealth of Massachusetts is benefiting from, and being recognized for, a significantly healthier population. It has also demonstrated measurable improvements in health care costs, quality, safety and efficiency. Widespread implementation and adoption of EHRs have provided added access to clinical information to providers at the point of care and to patients and consumers; reduced medical errors; and provided a platform for enhanced coordination of care.

[11] NEHN and MA-SHARE Electronic Health Record Interoperability and Health Information Exchange http://www.maehi.org/pdfs/mashare052709.pdf

[12] Summary of RAND research available at http://www.rand.org/pubs/research_briefs/RB9136/index1.html, Dec. 13, 2007.

Health care providers manage their patients' complete health care needs and electronically document the care they provide. For those patients who have authorized the sharing of their protected health information, providers are able to quickly, easily and securely access pertinent information recorded by themselves, other providers across the state, and patients themselves, which will assist in clinical decision-making. Providers share this information electronically with their patients, and patients with their providers, which further improves the patient-provider relationship, care coordination and quality outcomes.

Patients experience care in an environment that is focused on their specific needs. They are able, in a private manner, to quickly and securely access their own protected health information. In addition, they can use electronic communication to participate with their provider in their own care planning and quickly access/receive care electronically. Patients and consumers feel confident about the privacy and security policies and technology that protect and support their personal and protected health information.

Payers, including health plans, employers and public sector payers, experience a decrease in projected health care costs and utilization, due to the improved health of the population, reductions in costly medical errors, and increased efficiencies in the system.

A significant Health IT workforce throughout Massachusetts is skilled and knowledgeable in advancing all aspects of Health IT adoption and sophistication, including continued improvements in health care quality and safety, research, and Health IT analytics and development. This supports job creation in the areas of biotechnology, academia, research, technology and the healthcare delivery system, in a robust economy.

2.4.2. Health IT Strategic Plan Goals and Objectives

To achieve our vision of the future, the Commonwealth has set overarching goals, which will be shaped by the high-level objectives outlined on pages 16 and 17. These objectives will ensure that Health IT-related programs are working toward delivering the most effective health care to the residents of the Commonwealth. Health IT's goals and objectives should support the Commonwealth's goals for assuring access to care, improving quality of health care, containing the costs of care, and maximizing the health and wellness of all of the people in the Commonwealth.

Viewed as one of several means to achieving the Commonwealth's goals, the goals of the Health IT Strategic plan will ensure that providers will have and be able to meaningfully use EHRs and computerized order entry. In addition, they will be able to take full advantage of these tools to improve patient health, health care and health outcomes. Providers, patients and healthcare consumers will have the ability to share information with each other across health care systems, to ensure they provide/receive comprehensive, coordinated care in the most efficient way possible. Furthermore, the intelligent and appropriate use of Health IT will enable the state to be better informed about the health status of its residents and the quality of care that is delivered across all systems of care.

Massachusetts leads the nation in health care coverage because of it landmark 2006 health reform bill, but has among the highest healthcare costs in the nation.[13] Rising costs threaten the gains made in achieving near universal coverage, as personal health care expenditures remain a significant barrier to care. The shortage of primary care and other providers offering comprehensive care also threaten individuals' access to care. Massachusetts ranks among the best states in the nation in terms of health care quality[14], but the state ranks poorly on measures of quality that relate to coordination of care, such as preventable hospitalizations for chronic conditions and hospital readmissions. Despite recent attention

[13] MeHI Health Information Technology Plan: Final Recommendations, Deloitte, Oct. 14.2009.
[14] Ibid.

to the elimination of disparities, health care disparities among racial and ethnic groups and between the poor and non-poor exist and demand our continued attention.

The state is embarking on several bold initiatives to address these gaps, including the transformation of all primary care practices to patient-centered medical homes by 2015, reduction of preventable hospital admissions and readmissions, improvement of care transitions, and movement of the payment system away from a predominant fee-for-service system to one of global payments. In addition, the Health Care Quality Cost Council (HCQCC), also created under Chapter 305 of the Acts of 2008, adopted a goal for the state to decrease annual rising healthcare costs. The Health IT Strategic plan's goals must not only complement these other statewide goals, but equally important, must align with the federal goals.[15]

Goal 1: Improve access to comprehensive, coordinated, person-focused health care through widespread provider adoption and meaningful use of certified EHRs

Person-focused health care means that all relevant information about a given patient is available, at a given point in time, to whomever may be taking care of them, including family members. It also means that an individual's unique preferences, social situation and health risks are incorporated into their care plans and processes, and one can readily access their comprehensive health information.

Objectives

- Equitably increase the number of providers who can demonstrate meaningful use of interoperable EHRs across all service areas, including rural, suburban and urban areas where health disparities have been identified.
- Assure private and secure electronic access, use and portability of protected health information by all authorized individuals.
- Increase the number of patients whose care is coordinated across disparate delivery systems within the state and across state boundaries.

Goal 2: Demonstrably improve the quality and safety of health care across all providers through Health IT that enables better coordinated care, provides useful evidence-based decision support applications, and can report data elements to support quality measurement.

High quality care should be consistent and predictable. Use of secure auditable electronic systems that support care quality and safety should achieve these aims, while allowing data to be abstracted and used to identify areas that need improvement, at the provider level, as well as across systems of care and populations.

Objectives

- Equitably increase the number of ambulatory primary care providers that have re-engineered their care processes, to better manage chronic conditions, though adoption of patient centered medical home processes and Health IT that supports evidence based care.
- Adopt and promulgate a common set of Health IT enabled quality and safety measures across all payers and providers.
- Adopt meaningful use measures, as defined by the federal government, for reporting purposes across all agencies.
- Leverage existing reporting infrastructure, when appropriate.

[15] The Commonwealth of Massachusetts has aligned its goals to those goals outlined in the Strategic Plan released by the Office of the National Coordinator.

- Commit to the principles that hospitals and health care providers would report quality and safety measures one way, one time and to one place, to ensure they are collected consistently and with minimum administrative burden.
- Over time, track and improve quality and safety measures reported from EHRs.

Goal 3: Slow the growth of health care spending through efficiencies realized from the use of Health IT.

Well designed electronic health records, better communication between and among patients and their clinicians, and health information exchange among multiple stakeholders can bring efficiencies through administrative simplification, less redundancy in care, more timely care, and greater patient engagement with the health care system.

Objectives

- All payers in the Commonwealth will adopt a single set of Federal standards for eligibility and claims payment processes, which will be incorporated into certified EHRs.
- Over time, decrease standardized measures of administrative costs for both payers and providers.
- Patients report more timely, effective and appropriate care, both virtual and face to face.
- Decrease redundant testing.
- Document, track and minimize episodes of futile care.
- Engage patients to actively participate in managing their health information, their health and their care, and encourage providers to engage with and respond to their patients.

Goal 4: Improve the health of the Commonwealth's population through public health programs, research, and quality improvement efforts, enabled through an efficient, accurate, reliable and secure health information exchange processes.

Both demonstration of and actual improvements in the health of a population are dependent on efficient and timely access to secure and reliable information from multiple sources of data. This requires electronic health information exchange that is consistent with privacy policies, financially sustainable and driven by the state's health priorities.

Objectives

- Efficiently track and demonstrate improvement in the Commonwealth's key public health initiatives to improve the health of its population, leveraging both local and state Departments of Public Health.
- Support health reform in the Commonwealth, by providing ready access to data and information that is necessary for identification and implementation of key reform policies and strategies, while being meticulous in protecting patient information and carefully following the minimum necessary use of information standards
- Develop and promote effective and accessible disease prevention, health and wellness programs.

2.4.3. Strategies to Achieve the Commonwealth's Health IT-Related Goals and Objectives

The Commonwealth of Massachusetts must pursue a core set of strategies to achieve these goals and objectives (Chapters 3 through 8), and ensure that all health care stakeholders move forward together in support of the Commonwealth's common vision. The following six strategies are critical to achieving Health IT related goals and objectives.

Strategy 1: Establish Multi-Stakeholder Governance. Clearly defining the decision-making process around Health IT-related projects is critical to success. Experience with past Health IT projects has demonstrated the value of a public-private governance structure. Therefore, the Commonwealth's Health

IT initiative will be governed through a public-private partnership that will foster close and effective collaboration between the public and private sectors. The governance model will further uphold the public's trust, through transparent (publicly posted, easily understood and readily available) and effective use of public funds. The proposed governance structure acknowledges that while all Health IT organizations have their own governance, there must be a common structure that will facilitate and coordinate initiatives across the entire state.

- The Massachusetts Health IT Council consists of representatives from the public and private sectors. It will prioritize the use of public funds, in support of statewide Health IT-related projects, to ensure that those funds support the goals developed by the Health IT Council, health care reform initiatives, and the delivery of the highest value health care to Commonwealth residents.
- Ad Hoc Workgroups will be convened to ensure private sector participation and to provide direct input and recommendations to the Health IT Council, regarding priorities, alignment of public and private initiatives, and specific operational issues. Participation by the private sector, which includes consumers and advocates, is critical to the Commonwealth's success.
- MeHI will coordinate activities prioritized by the Health IT Council, including federally funded programs, such as the Regional Extension Center (REC), Health Information Exchange (HIE) implementation, and Workforce Development. MeHI is the REC and designated state-wide HIE for the Commonwealth and will support coordination of HIE activities across the Commonwealth.

Strategy 2: Establish a Privacy Framework to Guide the Development of a Secure Health IT Environment. Patients' confidence in how those involved in their care – and even more critical those NOT directly involved in their care (Markle Foundation Survey) – handle and access their protected health-related information is at the core of the patient's trust in the health care system. The Commonwealth will develop a privacy and security framework, such that consumers will understand who will use their health information and how they will use it, will have control over its use, and be confident the information is always protected from unauthorized access and used only for authorized purposes. Sanctions and remedies for breaches of information will be incorporated into the framework to motivate everyone to participate responsibly.

Patients will be able to designate how their health-related information is handled through a statewide HIE. The HIE will be designed to enhance their experience with the health care system, as well as support public health and quality reporting.

- MeHI will develop a certification program that will ensure that those authorized to provide information to or retrieve information from the statewide HIE have implemented appropriate processes to protect consumers' health-related information from unauthorized access. They will also ensure that information regarding this process is available, accessible and understandable to the public.
- The Health IT Council will leverage stakeholder input through an Ad Hoc Privacy and Security Workgroup to review, reconcile and strengthen, where appropriate, federal and state-specific laws and regulations in the development of policies and procedures governing the HIE.

Strategy 3: Implement Interoperable Health Records in all Clinical Settings and Assure They Are Used to Optimize Care. Today in the Commonwealth, only 40% of physicians use an EHR in their offices, 48% of hospitals use CPOE, and few patients have timely electronic access to their health-related information[16]. The Commonwealth will promote the adoption of EHRs in all clinical settings to improve access to, use of and interaction with health-information by patients and providers.

- The Commonwealth will provide assistance to priority primary care providers to promote implementation of EHRs through a federally funded program – the Regional Extension Center (REC). Priority primary providers include primary care providers in individual and small practices (ten or fewer professionals with prescriptive privileges) principally focused on primary care; public and critical access hospitals; community health centers and rural health clinics; and other settings that predominantly serve uninsured, underinsured and medically underserved populations.
- While serving to coordinate REC-related activities, MeHI will also support direct onsite services to priority providers, through incentive contracts with Implementation and Optimization Organizations (IOO), who will provide a variety of Health IT services. MeHI will also develop implementation programs to assist all providers in the Commonwealth, which will include outreach and education, local workforce support programs, and best practice tools, guides and methodologies.
- The Commonwealth will align with federal initiatives, to maximize Massachusetts providers' benefits from federal resources, such as HITECH incentives.

Strategy 4: Develop and Implement a Statewide Health Information Exchange (HIE) Infrastructure to Support Care Coordination, Patient Engagement and Population Health. The Commonwealth has found that electronic reporting and monitoring of information required for public health or quality reporting can dramatically improve the accuracy of that information, while decreasing the resources required to support current manual processes. While the use of electronic reporting is very limited today, it is key in supporting a future health care system capable of simultaneously improving the quality of care provided to all Commonwealth residents and reducing the costs of that care. Stakeholders in the Commonwealth have already invested a significant amount of time, effort and capital creating several community and provider-based HIEs in Massachusetts. Knowledge from those implementations will be used to develop a statewide HIE.

- While aligning with Federal HIE efforts (priority services), the Commonwealth (public and private sectors) will initially focus on services, such as administrative simplification, e-prescribing, electronic laboratory ordering, electronic public health reporting, quality reporting, prescription fill status, personal health record development and coordination of care/clinical summary exchange. The Commonwealth, with recommendations from the Ad Hoc Workgroups, is considering additional services to be provided by the HIE, as well. The final determination of services to be provided for the HIE will be based on the outcome of the planned HIE Operational Planning effort, which will be completed by August 31, 2010, and the subsequent competitive bidding process, which will result in a statewide HIE solution.
- MeHI will build a state-wide system, based on a "federated" model and will only store data in a centralized repository, when absolutely necessary, to support specific uses, such as public health, quality reporting, and overall population management.
- The Health IT Council will seek guidance on the sustainability of the Massachusetts HIE, by convening an Ad Hoc Health Information Exchange (HIE) Workgroup. This workgroup will provide input into the development of an HIE Operational Plan, including a business model for sustaining the

[16]Simon et al., 2009, Physicians' Usage of Key Functions in Electronic Health Records from 2005-2007. Journal of the American Medical Informatics Association.

statewide HIE. As noted in the introductory chapter, there are multiple, sustainable HIEs in the Commonwealth of Massachusetts, including NEHEN, which has been operational since 1998 and uses a subscription based funding model. The expectation going forward is that enough value will be derived by all HIE stakeholders to ensure a sustainable HIE in the Commonwealth. Once a final decision is made relative to the statewide HIE solution, a separate entity will be created incorporating a new public/private governance structure. The state-wide HIE will operate in a fashion similar to that of a public utility, where public and private funds collaboratively govern and sustain the HIE. A key component of the sustainability model will be the inclusion of MassHealth (Medicaid), which can be leveraged to provide federal matching funds and some technical infrastructure.

Strategy 5: Create a Local Workforce to Support Health IT Related Initiatives. The Healthcare Information and Management Systems Society (HIMSS) recently reported that over half the country's hospitals believe there is a lack of skilled workers available to support their Health IT-related projects.[17] The Bureau of Labor and Statistics also found an 18-37% gap between the number of experienced professionals required to implement all Health IT-related projects nationwide and those available to perform the work today.[18] Implementation of Health IT, on the scale required in the Commonwealth of Massachusetts, will require people with skill sets that are in demand both inside and outside the state. The Commonwealth will help to advance and increase training programs to deliver the number of graduates that will be required to support the achievement of our Health IT vision.

Strategy 6: Monitor Success. As with most large initiatives, a program to monitor and report progress against a specific set of measures is essential in keeping the Commonwealth 'on track' towards achieving its Health IT goals and objectives. While the governance of this initiative has been designed to maximize transparency and public/private collaboration, a comprehensive set of measures and monitoring programs will be required to ensure that residents of Massachusetts achieve the full benefits of Health IT.

- Implementation and process measures will focus on successful EHR implementation and adoption of Health IT by providers and consumers, and will provide feedback on how use of Health IT in the community has changed over time.
- Utilization and outcome measures will focus on improving levels of quality, safety, patient engagement and efficiency, as a result of Health IT-related initiatives.

2.5. Communication and Outreach Plan

Effective communication to both our public and private stakeholders regarding the Commonwealth's Health IT goals is a critical element of our statewide plan. Through the Project Management Office, a variety of messages will be created to explain our vision, mission and objectives. Our messages will reflect transparency, inclusiveness and the strength of our public/private partnerships. Multiple venues, including but not limited to town halls, web applications, social networking applications, print media and other appropriate forums will be used to reach out to all our health care stakeholders. A particular focus will be the formation of an ad hoc workgroup for consumer engagement, which will advise on how to measure issues related to privacy, security, portability and usefulness. Transparency will be clearly reflected in the balanced view of the information disseminated, clearly explaining benefits and risks. Additionally, the Commonwealth will leverage educational tools provided by other states and the Federal government. Close collaboration with MassHealth (Medicaid) will be an important element of our communication strategy, as we work to assist Medicaid eligible providers in achieving meaningful use and

[17] Vantage Point, *The Healthcare IT Workforce*, http://www.himss.org/content/files/vantagepoint/pdf/VantagePoint_200909.pdf, Sept. 2009.

[18] Bureau of Labor Statistics - Occupational Outlook Handbook 2008.

qualifying for HITECH incentive payments. Additionally, resources provided by the Regional Extension Centers will support our outreach to providers.

2.6. Current State vs. Future State

The table below highlights some of the key differences that exist between our current fragmented, provider oriented state of health care and one where widespread adoption of Health IT would allow care to be centered around the needs of both an individual patient and a larger community. While there are some patients who are cared for in large integrated systems that are fully electronic, such as the Veterans Administration, or have access to physicians who e-prescribe now, the vast majority of the Massachusetts population is still cared for in a delivery system that is supported by a combination of paper records and electronic transactions. Even among providers who currently use an EHR system, they have not maximized the system's potential. It is important to move these providers to the next level.

Activity	Current Process	Future State
Accessing care in physician office	Patient calls provider to make office appointment, which usually requires a call back. Resulting appointment might not be at the most convenient time for the patient.	Patient makes an online query about a particular problem. Clinician provides online guidance or answers to questions, or, if conversation would be more productive, provides a same day call-in appointment. If face to face encounter is necessary, appointment is made online for a time that is convenient for patient.
Administering Benefits	Multiple calls are made between provider and insurance company, between patient and insurance company, and patient and provider to assure that coverage is available for necessary services. Physicians spend 30 minutes of this administrative time for every 60 minutes of direct patient care.	Providers and patients can easily access online, clearly defined, up to date eligibility status, benefits and covered providers.
Preparing for visit	Patient completes several pages of standard information, while spending time in waiting room. The information is contained in the EHR, but it is not easily accessed by the provider or patient, or the provider is not incorporated into practice design.	All "clipboard" information is available online, including a list of current medications. Patients need only to acknowledge and record any updated clinical information and make note of problems or errors.
Documentation of clinical information	Most documentation of clinical problems, diagnosis and treatment is currently on paper, of varying degrees of legibility, and sequestered in multiple records among multiple providers of care – all of which make access to information by patients difficult. Documentation is contained in EHR but is not accessible to providers and patients, in a meaningful way.	Use of certified EHRs allows for digital documentation of both text and structured data, such as vital signs and lab results. Patients have electronic access to the clinical information generated by the provider within a matter days, if not immediately.
Tests to prevent or screen for various problems	Immunizations, mammography, other screening tests and routine screening specific to various conditions, such as blood tests for diabetes are dependent on the patient or provider remembering and being able to look up the timing of previous tests and order new ones.	Automated systems send prompts to patients and their clinicians regarding the need for routine screenings. Patients schedule the tests online at a time that is convenient for them, while simultaneously notifying their clinician they have done so. Should they miss an appointment, both are notified and the test is rescheduled.

Activity	Current Process	Future State
Coordinating Care among multiple providers	A patient who sees a primary care physician and other specialists frequently discovers that information is not shared among them, leading to duplications in prescriptions, testing, and confusion about diagnoses and treatments.	The electronic health record used by any one clinician in any setting captures pertinent information from all other providers of care and the patients themselves, so they are fully informed about the patients' status at the time of contact: in an office, in an emergency room, or virtually.
Referrals	Seeing a specialist at the request of another physician requires administratively burdensome paperwork, to assure coverage. It also requires extensive copying/faxing of paper records.	A referral to another physician is made and scheduled immediately, since automated benefit checking is part of the process. The new physician has access to all online information through a health information exchange process and the patient can review the referrals from a secure portal or personal health record.
Prescriptions and refills	Prescription is handwritten and given to patient to bring to the pharmacy. It may be illegible, requiring a call to physician; a duplicate of another medication; or not covered by insurance. Electronically generated prescription is printed and handed to or sent to patient to deliver to pharmacy.	E-Prescribing allows clinician to order the appropriate medication that is covered by the insurer and patient to access and review this information. E-Prescribing also checks for allergies, drug-drug interactions, appropriate dosing and allows for easy online refills. Should a patient not obtain medication as prescribed, clinician is notified and can follow up with the patient.
Test results	Patients frequently make calls to office or wait for a letter to arrive in mail regarding test results. They are often told to assume that all is well, if they do not hear anything. Providers await paper results, review them at end of day, paste in chart, and notify patients as above.	Test results are available electronically to patients, as soon as possible following their entry into electronic health record of ordering provider. They are also available to other providers as designated by the patient.
Access to research and targeted public health opportunities	Most patients are not aware of research projects that may affect their specific condition. If they are on a research protocol, both the physician and patient must fill out special forms that capture research data in a specified way.	Patients may authorize submission of their names and status to secure registries, which allow them to be notified of research programs and public health interventions specific to them. Examples include priority access to specific flu vaccines for asthmatics in the event of an epidemic, or notification of research on a new, non invasive approach to administering insulin.
Sharing information with other family members/loved ones	Providers must have written documentation from a patient before sharing any information with their loved ones. This documentation needs to reside in as many places as a patient receives care, and may be difficult to obtain under certain circumstances.	Through health information exchange mechanisms, patient authorization about who can access their protected health information, including the type of health information, are clearly defined and available to any of their health care providers.

3. Strategy 1: Establish Multi-Stakeholder Governance

In a statewide initiative of this scale, complexity and cost must be governed in a way that upholds the public's trust through transparent decision processes and cost effective use of public funds. The governance structure that will be in place is designed based on the following principles:

- Support and leverage the use of existing public and private sector technologies, where appropriate.
- Leverage the wealth of knowledge residing in the Commonwealth.
- Ensure that appropriate conflict of interest controls are in place to protect both public and private stakeholders, without stifling innovation.
- Promote transparency and the efficient use of funds to support prioritized programs.
- Promote collaboration across the public and private sectors, by eliciting and encouraging public conversation and input.
- Demonstrate flexibility in making adjustments to proposed governance structure, as required, to ensure effective public/private partnership.
- Ensure sustainability and measurable positive outcomes over time.
- Ensure appropriate accountability to achieve the goals of the plan.

Key Points

- The governance structure for the Commonwealth is a public/private partnership collaboration overseen by a Health IT Council of private and public sector members. The Commonwealth will demonstrate flexibility in making adjustments to a proposed governance structure, as required, to ensure an effective public/private partnership.
- Multiple Ad Hoc working groups allow for broader participation from the private sector.
- MeHI will act as the Project Management Office (PMO) responsible for oversight of Health IT strategies and coordination with the Office of the National Coordinator (ONC) on federal programs.

Building upon the legislative framework contained in Chapter 305 of the Acts of 2008 (the "Act"), the Commonwealth will employ a governance model based on a public-private collaboration that will assure substantial input from the private sector (including consumers and consumer advocates), into the formulation of HIE policy, while retaining accountability, oversight and decision-making authority in governmental agencies, specifically the Health Information Technology Council (the "Health IT Council"); the Secretary of the Executive Office of Health and Human Services (EOHHS), who chairs the Health IT Council (the "Secretary"); and the Massachusetts Technology Collaborative (MTC), of which MeHI is a division. Private sector representation will be secured, in part, through a majority of the appointees to the Health IT Council and through Ad Hoc Workgroups, who will provide advice to the Health IT Council.

This structure, which has mechanisms for private and public participation and levels of public oversight and accountability, will foster effective communications among representatives of the private sector and those agencies of the Commonwealth who will design, develop and implement a state-wide interoperable health information exchange (HIE). The structure gives the Secretary, who is accountable directly to the Governor, the key role in developing policy associated with formulating and implementing the state-wide plan for creation and maintenance of the Network, and for updating that plan on a regular basis (the plan and its updates is referred to as the "Health IT Strategic Plan"). At the same time the structure assures significant and substantive input from non-governmental sources.

3.1. The Health IT Council

The Health IT Council, as described in Chapter 305, consists of nine members, including four representatives of governmental agencies and five representatives from the private sector. The four agencies are the Executive Office of Health and Human Services, the Executive Office for Administration and Finance, the Health Care Quality and Cost Council and the Medicaid Office. The five private sector members are appointed by the Governor. Of the five, one is to be an expert in health information technology, one an expert in law and health policy and one an expert in health information privacy and security. The Health IT Council is chaired by the Secretary, who also chairs the Health Care Quality and Cost Council and oversees the Medicaid Office. Because of these various roles, the Secretary, in partnership with the private sector, will define the governance structure, which will be established to implement a statewide HIE in the Commonwealth. The new governance structure will ensure that various agencies of the Commonwealth and private sector organizations are coordinated.

3.1.1. Responsibilities

The Health IT Council is responsible for the following:

- Along with MTC, approval of the State Health IT plans and budgets associated with its implementation
- Approval of contracts between MTC and Implementing and Optimization Organizations (IOOs)
- Along with MTC, approval of the use of funds within the eHealth Institute Fund (the "Fund")
- Implementation of the Health IT Strategic Plan

In addition, the Health IT Council is to be consulted on the issuance of requests for qualifications to IOOs, prior to IOOs being certified, and on the mechanisms that MeHI proposes to use to fund Health IT activities in the Commonwealth.

3.2. Massachusetts Technology Collaborative (MTC)

MTC is an independent, non-partisan development agency chartered by the Commonwealth to promote new economic opportunity and foster a more favorable environment for the formation, retention and expansion of technology-related enterprise in Massachusetts. MTC serves as a catalyst for growing the knowledge and technology-based industries that comprise the Commonwealth's Innovation Economy. As one of its activities, MTC works with major healthcare organizations to implement e-health solutions that are intended to improve the quality and continuity of patient care and reduce costs. MTC operates at the intersection of government, industry and academia. It brings together leaders and stakeholders to advance technology-based solutions that lead to economic growth and improved healthcare. MTC energizes emerging markets by filling gaps in the marketplace, connecting key stakeholders, conducting critical economic analyses, and providing access to intellectual and financial capital. MTC operates four programmatic divisions that support economic growth and innovation and attempt to generate public benefits for Massachusetts citizens: (1) John Adams Innovation Institute; (2) Massachusetts e-Health Institute; (3) The Massachusetts Broadband Institute; and (4) Healthcare and Life Sciences Unit.

MTC functions as the legal contracting entity, acting on behalf of its MeHI division. Therefore, MTC is the legal entity that will contract with the IOOs who will provide services to support implementation of the state Health IT Strategic Plan; certify IOOs to work with providers to adopt certified EHR systems and connect with the statewide HIE; contract with providers to supply program management support to promote EHR dissemination; and provide staff support to the Health IT Council.

3.3. Massachusetts eHealth Institute (MeHI)

Chapter 305 of the Acts of 2008 (Chapter 305), enacted in August 2008, created MeHI as a non-divisible component of the MTC. It also created the Health Information Technology Council (Health IT Council), chaired by the Secretary of Health and Human Services, to oversee MeHI's activities. MTC, acting through MeHI and the Council collectively, constitutes the single State entity responsible, in accordance with Chapter 305, for coordinating and facilitating the dissemination of EHR systems throughout the Commonwealth, in all provider settings, networked through an interoperable statewide health information exchange (HIE). MeHI, working with the Council, was tasked with developing and implementing a statewide plan to carry out this objective. Chapter 305 also contains a mandate that the Massachusetts Department of Public Health (MDPH) and the Board of Registration in Medicine (BORIM) adopt regulations requiring the use of EHR systems, as a condition of licensure for hospitals, community health centers and physicians. MeHI is collaborating with the BORIM, MassHealth (Medicaid) and MDPH to ensure a consistent approach for meeting the needs of both Chapter 305 and the Meaningful Use requirements of the HITECH Act.

MeHI's Director is appointed by MTC's Executive Director, and is charged, under the Act, with preparing the state Health IT Strategic Plan and budgets for implementing the Plan. The Plan and budgets are both subject to the approval of the Health IT Council and MTC's Board. In addition, the MeHI director is the state's Health IT coordinator responsible for aligning the state's Health IT activities.

With consultation from the Health IT Council, MeHI also develops the various mechanisms for funding Health IT through use of the Fund. Grants awarded from the Fund are based on recommendations of the MeHI Director and are subject to the approval of MTC's Board and the Health IT Council. In close consultation and collaboration with the Medicaid Office (MassHealth), the Act also charges MeHI to maximize federal Medicaid matching funds that may be available.

To coordinate the Commonwealth's HIE implementation strategies, MeHI will develop a Project Management Office (PMO) consisting of a centralized team with experience in managing large and complex technology projects. To ensure the integrity of the statewide Health IT system, the PMO will drive multiple simultaneous activities all focused on implementing the Network in a manner that is consistent with the Act, federal and state laws, and among providers. The PMO will be in an excellent position to understand cross-project dependencies and implications, resource allocation requirements and overall risks associated with implementing the HIE network. The PMO staff, working directly with IOOs, providers and other organizations in both the public and private sectors, will implement standard processes and best-practice project management techniques to monitor implementation, in accordance with agreed-upon timelines. Additionally, the PMO will be responsible for managing operational activities, such as specific reporting necessary for compliance with federally funded programs. Tools provided by the Office of the National Coordinator in support of the federal grants, will be leveraged when possible, to support the activities of the PMO.

3.4. Ad Hoc Workgroups

Given the breadth of expertise in the Health IT area possessed by residents of the Commonwealth and the importance of including substantial private sector input into the planning process for HIE development and maintenance, the Secretary of the Executive Office of Health and Human Services, as chair of the Health IT Council and using MeHI to coordinate, has established six Ad Hoc Workgroups. The Workgroups will serve as the primary source for obtaining advice and recommendations, when needed, from private sector participants, in addition to those who formally serve on the Health IT Council. The Workgroups are expected to be instrumental in maximizing public/private collaboration, facilitating communication and helping to assure that strategic alignment exists between the work of the Health IT Council and national Health IT activities.

The Workgroups, through their role in providing advice and guidance to the Health IT Council, are expected to make invaluable contributions to the shape and successful implementation of the state Health IT Strategic Plan. However, because of the application of certain provisions of Massachusetts law, the Workgroups will not have direct executive or oversight functions, and will be convened only when the Health IT Council has a particular issue to address that can benefit from private sector comment or discussion. Where possible, the Ad Hoc Workgroup will also be leveraged to support multiple Health IT initiatives in the Commonwealth.

3.4.1. Six Ad Hoc Workgroups

Clinical Quality and Public Health Workgroup

Primary Focus: Make recommendations for prioritizing the capabilities supported by the HIE and the harmonization of public health and quality reporting across federal, state and private entities.

- Advise on public health reporting priorities and reporting technologies.
- Work along with the other reporting initiatives, including the Expert Panel on Performance Measures, to ensure the standardization of quality and outcome reporting measures and technologies across the Commonwealth.

Consumer Engagement Workgroup

Primary Focus: Make recommendations on consumer and other public education.

- Make recommendations on consumer education, outreach services and participation.
- Elicit consumers' input on how to use Health IT to improve their health and healthcare experience.
- Advise on patient engagement and participation in health and health care information initiatives.
- Advise on public and media relations, with targeted messages to consumers, providers, policymakers and other stakeholders, as appropriate.
- Make recommendation about targeting Health IT to different population sectors to address disparities in use and access of healthcare resources.

Privacy and Security Workgroup

Primary Focus: Advise on privacy and security policies for HIE and participating systems, both within Massachusetts and between states.

- Make recommendations on privacy and security framework, using existing frameworks (e.g., Markle Foundation, ONC) and adapting them to Massachusetts needs and requirements.
- Make recommendations on common consent and authorization policies for the statewide HIE and between states, making sure to carefully consider "sensitive health information" issues.
- Make recommendations on minimum privacy requirements that participating entities must meet to participate in HIE (intrastate and interstate).

Regional Extension Center (REC)/Electronic Health Records (EHR) Workgroup

Primary Focus: Advise on the activities and performance of the Regional Extension Center, as well as provider Electronic Health Records adoption across the state.

- Acting as the REC, receive, review, respond to and make public periodic reports from MeHI.
- Provide input into the statewide deployment of EHRs, in all provider settings.
- Provide guidance on common tools or approaches to meet the goals of the REC.
- Provide guidance on sustainable business model (REC).

Health Information Exchange (HIE) Workgroup

Primary Focus: In the context of development of the HIE Operational Plan, advise on how to develop and maintain functional and technical requirements for the HIE (intra and inter-state).

- Receive, review, respond to and make public periodic Project Management Office (PMO) reports.
- Provide recommendations on a common privacy and security framework or certification program.
- Advise on maintaining the IOO's approach to implementing nationally recognized interoperability and terminology requirements and standards.
- Advise on the technical architecture, including the architecture for the proposed National Health Information Network (NHIN).
- Advise on options for long-term sustainability.
- Provide recommendations on how to address long-term financial sustainability of HIE and REC services.
- Interpret national and Commonwealth legislation, as it relates to operation of the HIE, and provide recommendations.
- Advise on activities of the Implementation and Optimization Organization (IOO) related to the secondary use of data flowing through HIE.
- Make recommendations on the types and sequence of capabilities to support adoption of HIE by all stakeholders, including providers and patients.

Workforce Development Workgroup

Primary Focus: Advise and assist with the coordination of the Health IT workforce development activities across the state.

- Identify specific needs and skill sets required for EHR deployment, while leveraging curricula/capabilities that are provided from federal grant awards.
- Advise on strategies for Health IT job creation.
- Coordinate activities with other state agencies, private employers and educational institutions.
- Advise on Health IT workforce development efforts to support public health, research and biotechnology.
- Advise on workforce development efforts, as related to consumer outreach.

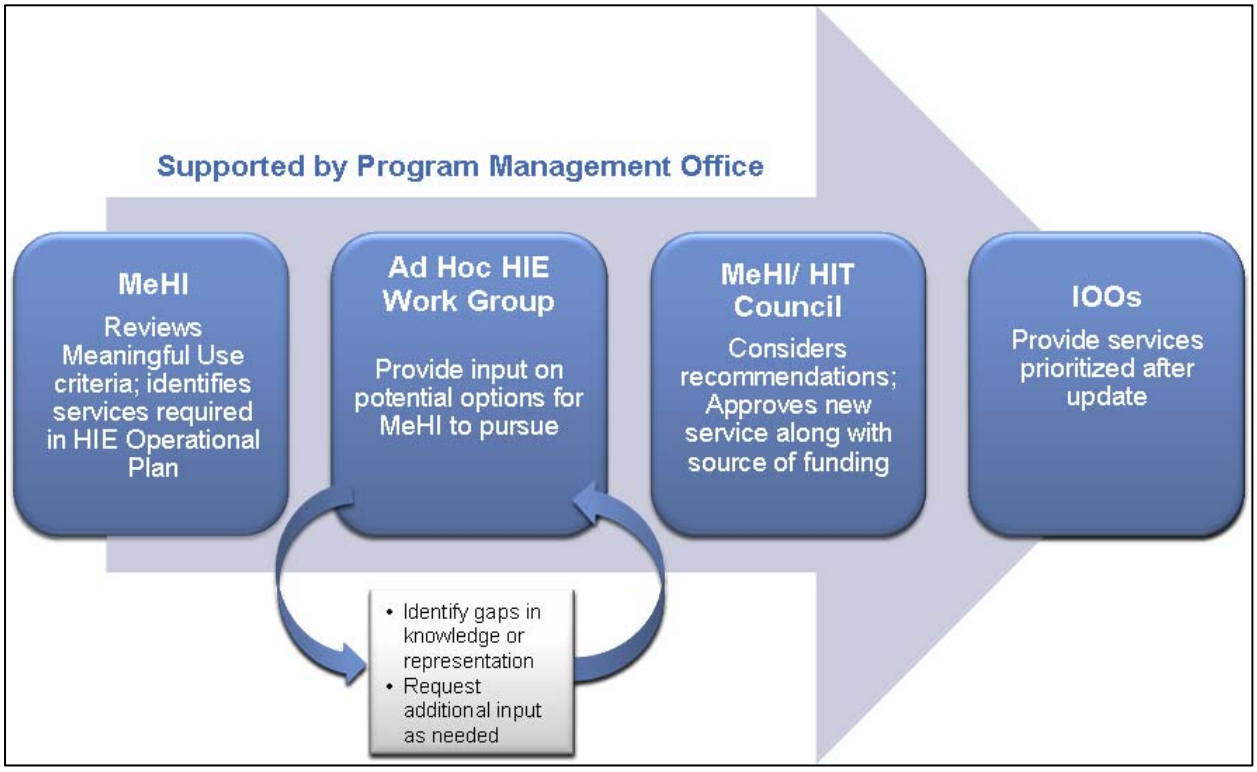

Figure 3.1: Example of how Ad Hoc Workgroups participate in the decision making process

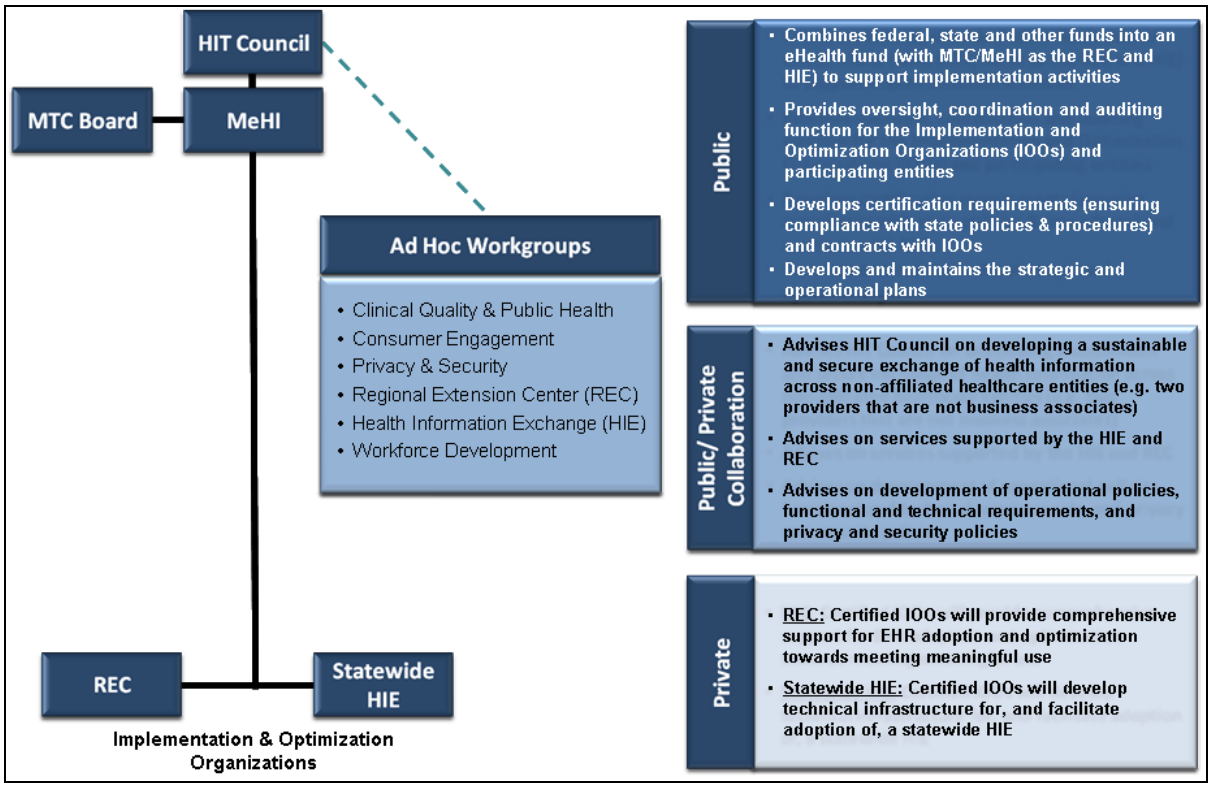

Figure 3.2: Schematic of governance structure and elements of public/private collaboration for Network implementation.

3.5. Next Steps

1. The Massachusetts Health IT Council, consisting of representatives from both the public and private sectors, will 1) prioritize the use of public funds that support the statewide Health IT-related projects; and 2) consult on the issuance of requests for qualifications to IOOs.
2. The Massachusetts Technology Collaborative (MTC), acting on behalf of its MeHI division, will 1) contract with the IOOs who will provide services to support implementation of the Health IT Strategic Plan; 2) certify IOOs; 3) provide program management support to contracted providers; and 4) provide staff support to the Health IT Council
3. The Massachusetts eHealth Institute (MeHI) will 1) implement the Health IT Strategic Plan; 2) develop various mechanisms for funding Health IT through the use of the Fund; and 3) develop a project management office (PMO).
4. Establish and convene the proposed six ad hoc groups to ensure the public and private sector's recommendations regarding priorities, alignment of public and private initiatives, and operational issues are considered, and that a broad representation of interests and ideas will be elicited and incorporated into Health IT effort going forward.

4. Strategy 2: Establish Privacy Framework

A patient's confidence in the way their health-related information is used, accessed and disclosed is at the core of their trust in the health care system. Therefore, privacy and security are essential elements of this plan. All health information must be stored, transmitted, viewed and disposed, in a manner that balances the need to protect individual privacy with the need to allow health information to be shared with authorized participants, for improved quality of care. The Commonwealth and federal government both understand that development of and adherence to a consistent and coordinated approach to privacy and security is critical in achieving a high level of trust among consumers, health care providers, and other health care organizations participating in an electronic health information exchange.[19]

Conceptually, privacy and security are often used interchangeably. While they are interrelated, they are not synonymous. Security primarily includes the information technology related processes and components that are implemented to achieve acceptable levels of privacy. Privacy refers to the policies and procedures governing authorized access to a patient's health-related information.

In 1996, Congress passed the Health Insurance Portability and Accountability Act, commonly known as HIPAA, to establish standards for electronic health transactions and national identifiers for providers, health plans and employers. HIPAA also includes explicit rules regarding the privacy and security of health data. Extending these guidelines, the Office of the National Coordinator (ONC) developed eight principles for a Nationwide Privacy and Security framework. MeHI will use these ONC principles, in addition to public and private input, to develop the Commonwealth's privacy and security approach. The following table provides a summary.

Key Points

- The Commonwealth's privacy and security framework will ensure that all information is well protected, that patients understand how and by whom their information is accessed and used, and have the ability to exercise control and choose how their health information is shared.
- The Commonwealth's privacy and security framework will comply with state and federal regulations.
- Collaboration across both the public and private sectors will be required to develop the common privacy and security framework.

[19] Office of the National Coordinator for Health Information Technology. October 2008. "Nationwide Privacy and Security Framework for Electronic Exchange of Individually Identifiable Health Information."

4.1. ONC Principles for a Nationwide Privacy and Security Framework[20]

Principle	Description
Individual Access	Individuals should be provided with a simple and timely means to access and obtain their individually identifiable health information, in a readable form and format.
Correction	Individuals should be provided with a timely means to dispute the accuracy or integrity of their individually identifiable health information, and to have erroneous information corrected or, if their requests are denied, to have a dispute documented.
Openness and Transparency	There should be openness and transparency about policies, procedures and technologies that directly affect individuals and/or their individually identifiable health information
Individual Choice	Individuals should be provided a reasonable opportunity and capability to make informed decisions about the collection, use and disclosure of their individually identifiable health information.
Collection, Use and Disclosure Limitation	Individually identifiable health information should be collected, used and/or disclosed only to the extent necessary to accomplish a specified purpose(s) and never to discriminate.
Data Quality and Integrity	Persons and entities should take reasonable steps to ensure that individually identifiable health information is complete, accurate and up-to-date, to the extent necessary for the person's or entity's intended purposes and has not been altered or destroyed in an unauthorized manner.
Safeguards	Individually identifiable health information should be protected with reasonable administrative, technical, and physical safeguards to ensure its confidentiality, integrity, and availability and to prevent unauthorized or inappropriate access, use, or disclosure.
Accountability	These principles should be implemented, and adherence assured, through appropriate monitoring and other means and methods should be in place to report and mitigate non-adherence and breaches.

4.2. The Commonwealth's Privacy and Security Framework

As mentioned in the Introduction, much of the sharing of current information across organizations is primarily supported by a paper process. It is mainly the patient's responsibility to ensure that copies of their primary care provider's medical records reach the specialist prior to their visit. In the future, the Commonwealth envisions that most residents will have the ability to share their medical records with their caregivers through Health Information Exchange (HIE) that will ensure that those authorized to provide information to or retrieve information from the statewide HIE have appropriate processes in place to protect consumers' health related information from unauthorized access. The Commonwealth's privacy and security framework will focus on the following key areas:

- Compliance with and development and coordination of policies and standards, using frameworks (e.g., ONC, Markle Foundation), that have been developed and vetted by a broad-based group of stakeholders
- How to respond to and mitigate breaches of information, quickly and transparently
- Secure Health Information Exchange Technology
- Process for Certification
- Consent Management

[20] Office of the National Coordinator for Health Information Technology U.S. Department of Health and Human Services, *Nationwide Privacy and Security Framework For Electronic Exchange of Individually Identifiable Health Information*, December 15, 2008

4.2.1. Compliance with Policies and Standards

As a prerequisite to developing consistent privacy and security controls within the HIE, policies and standards around information security, data protection, user access management and related areas must be developed and documented. These policies and standards will support the guiding principles and requirements for privacy and security within the HIE infrastructure.

Multiple federal and state laws and regulations govern privacy and security requirements for protected health information. The following table identifies a number of the key laws and regulations that will need to be incorporated into the Commonwealth's privacy and security framework. The Ad Hoc Privacy and Security Workgroup will provide advice and recommendations to the Health IT Council and MeHI, as needed, in the review of these federal and state-specific laws and regulations. The role of the Commonwealth will be to ensure that there is a set of privacy and security standards consistent and in line with Federal and State laws, so the community can continue to deploy EHRs and HIEs within a common framework. The role of the Commonwealth should be to define the standards and coordinate these activities. The mechanism for addressing this complex issue will be included in the subsequent HIE Operational Planning process, which will be completed by August 31, 2010. The implementation of the recommendations for the planned statewide HIE will be required of the vendor/s who will be selected, as a result of the competitive bidding process expected in the fall of 2010.

Federal and State Privacy and Security Regulations and Policies

Federal Regulations and Policies	Massachusetts Regulations and Policies
Health Insurance Portability and Accountability Act (HIPAA)	Chapter 305
Health Information Technology for Economic and Clinical Health (HITECH) Act	MA 201 CMR 17:00
Federal Information Security Management Act (FISMA)	Executive Order 504
Medicaid Information Technology Architecture (MITA)	
Health information technology Standards Panel (HITSP)	
National Institute of Standards and Technology (NIST) Special Publications 800 Series	
Privacy Act of 1974 Fair Information Practices	

4.2.2. Secure Health Information Exchange Technology

As the primary technologies that will be used to aid the provider and empower the patient, EHRs and HIE must be based on technical models that ensure protection of patients' health-related information. The technical requirements for achieving this goal will be specified in the HIE Operational Plan and will include security provisions that apply to interstate information exchange.

4.2.3. Process for Certification

When participating in a future statewide HIE, the Commonwealth will implement a process, by which compliance with common policies and procedures are validated through a certification program. As part of the program, MeHI will certify that all entities that connect to the statewide HIE meet or surpass pre-designated privacy and security thresholds. The approach for certifying HIE participants is still being defined.

When making recommendations to the Health IT Council and MeHI on the most appropriate path on which to move forward, the Ad Hoc Privacy and Security Workgroup will consider existing models, as well as the option of creating a custom model.

4.2.4. Consent Management

Consent management is about ensuring that consumers have the ability and understanding of how to exercise their right to control their data at specified levels of granularity. If a patient just wants information shared for research and direct care coordination with their physician, but does not want to be in a registry or called by an insurer's disease management program, they should be able to control that access. Once the process is defined, a comprehensive education and marketing campaign is planned for consumers, providers and non-clinical staff, to ensure they all understand their rights and obligations and what it means to consent to being part of a state-wide HIE.

The statewide HIE will require a process to inform patients about HIE. It will allow the patient to exercise control and choose how their health information is accessed, used and disclosed. The consent management approach will include education about how a patient's information will be specifically used for the purposes of patient care, public health reporting, disease management, registries, quality reporting, and other potential secondary uses. Under Chapter 305 there is an Opt In or Opt Out provision permitting patients to decide if and how their health information is accessed, used and disclosed. In addition, under the provisions of the HIE Cooperative Agreement with HHS, the Commonwealth must address the need for a common consent approach with adjoining states.

4.3. Next Steps

1. Develop and document Health Information Exchange policies and standards that reflect the Commonwealth's privacy and security framework and are consistent with Federal laws.
2. Specify primary technologies used for health information exchange, based on technical models that ensure protection of health related information.
3. Develop or adopt a certification program for entities that connect to the statewide HIE.
4. Define the consent management process, including the education and marketing of the process.
5. Solicit consumer input on issues of consent, privacy, breach, and defining and handling of "sensitive" health information.

5. Strategy 3: Implement Interoperable Electronic Health Records

The Massachusetts Health Care Quality and Cost Council (HCQCC) and Institute of Medicine have specifically recommended widespread adoption and use of interoperable Health IT by providers and patients, to improve efficiency of the health care system, while simultaneously improving the quality and safety of health care. Implementing interoperable Health IT in the clinical setting, such as a hospital, physician's office, at a patient's home, or anywhere clinical care is being delivered is required for the Commonwealth to achieve its Health IT vision. Ultimately, the use of these Health IT tools, including EHRs, will enhance the patient-provider interaction, by ensuring better communication, transparency in the interventions or test results, and better engagement of patients in the decision-making process.

Key Points

- EHRs can help clinicians improve safety, quality and efficiency of care in clinical settings.
- The Commonwealth has a set of goals for all providers to adopt certified EHRs by January 1, 2015.
- MeHI will support clinicians by coordinating the implementation of certain processes, such as automated public health reporting.
- MeHI, as a federally funded Regional Extension Center, will provide direct assistance through contracted IOOS to approximately 2,500 priority primary care physicians, as they adopt and meaningfully use certified IOOs.
- The Regional Extension Center will develop a suite of services.

The Commonwealth and federal government share a common set of priorities, in regards to certain objectives and measures that determine whether physicians and hospitals have adopted and 'meaningfully use' a certified EHR, when caring for every patient. Furthermore, the federal government, through new incentive payments starting in 2011, will start awarding bonuses to both hospitals and eligible clinicians with prescriptive privileges, to offset some of the cost required to acquire, implement and meaningfully use healthcare information technology. The federal government anticipates spending $36 - $45 billion, nationally, on these direct incentives as providers become meaningful users of certified EHRs[21]. Given that federal objectives and measures of 'meaningful use' align with those envisioned by the Commonwealth, the Commonwealth will adopt those requirements as part of its programs. Beyond providing financial assistance to help defray the cost of moving to a certified EHR, the 'meaningful use' requirements promote the concept that providers must go beyond merely installing technology, to incorporating the technology into their workflow and care delivery, such that it improves patient care and safety outcomes. The patient's providers will use interoperable EHRs to care for every patient in the clinical setting. Certain changes in the process, such as electronic transmission of prescriptions to the local pharmacy will become commonplace. Similarly, automated routing of lab results back to the provider will become the future standard of care.

[21] MeHI Health Information Technology Plan: Final Recommendations, Deloitte, Oct. 14.2009.

5.1. Achieving Meaningful Use of Electronic Health Records

Before proposing state coordinated tactics and methods to assist with increasing the Commonwealth's EHR adoption rate, analysis and studies were completed to estimate the current state of adoption of EHR's in three large categories:

1. Ambulatory Office Physicians

   While Massachusetts is considered a national leader in Health IT, the adoption rate of EHRs by physicians in this state is still limited. Overall, Massachusetts has more than 15,000 office-based physicians, and it is estimated that only 40% have implemented an EHR.[22] Most of these physicians are concentrated in the greater Boston area, where they are supported by a number of integrated delivery networks. EHR adoption is significantly lower in central and western Massachusetts where there are a higher proportion of smaller, independent practices and hospitals.

   As discussed previously, what is important for realizing the benefits of Health IT in Massachusetts is not the number of physicians using an EHR, but the number that are using EHR in a way that enables improved access, increases quality and safety, and ultimately improves health outcomes for their patients. Although there are currently no statistics, the general consensus is that there is still a tremendous amount of work to be done to implement EHRs for those physicians who do not already have them and to move all physicians towards the meaningful use of the technology.

2. Community Health Centers and Federally Qualified Health Centers

   Community Health Centers (CHC) and Federally Qualified Health Centers (FQHC) are other examples of where there is an opportunity to increase EHR adoption. These centers deliver care to Massachusetts' underserved population. Forty-three of the state's CHCs are Federally Qualified Health Centers (FQHC), which receive federal funding. Together, these 43 CHCs employ more than 1,000 care providers; i.e., physicians, specialists, dentists, nurse practitioners, counselors, etc. Of this number, more than 500 are primary care physicians. While more than half of these CHCs have implemented an EHR, there are still many who have not and thus, have not yet started to work towards achieving meaningful use.

   As the state implements the Health IT Strategic plan and supports meaningful use of EHR's among ambulatory office physicians and community health centers, the state will track specific outcomes related to specific goals the state has adopted through the Massachusetts HCQCC, including the following;

   - Implement patient centered medical homes to promote the management of chronic care models, with an initial emphasis on diabetes.
   - Reduce avoidable hospitalizations and emergency department visits.
   - Reduce preventable hospital readmissions.
   - Reduce medical errors, especially as they relate to serious reportable events.
   - Improve care coordination, as patients transition from one clinical setting to another or to the community.
   - Improve end of life care.

[22] Simon et al., 2009, Physicians' Usage of Key Functions in Electronic Health Records from 2005-2007. Journal of the American Medical Informatics Association.

3. Acute Care Hospitals

   Implementing EHRs and Computerized Physician Order Entry (CPOE) in hospitals is much more complex than in the ambulatory settings. MeHI estimates that almost 48% of the Commonwealth's 72 acute care hospitals have partially implemented CPOE with clinical decision support.[23] Much of this success is related to MeHI's work on the Massachusetts Hospital CPOE initiative, a partnership with the New England Healthcare Institute (NEHI). Chapter 305 heightened the sense of urgency, by mandating that by October 1, 2012, CPOE implementation will be a condition of hospital licensure.

   As with individual physicians, if hospitals simply install Health IT, neither the hospital nor the Commonwealth will realize its benefits. Hospitals need to integrate the technology into their workflow and care delivery processes. So while many of the state's hospitals have adopted CPOE, most still have significant gaps in achieving the federal definition of "meaningful use", in both technology and care process. A recent study by MeHI suggests that the majority of hospitals in the Commonwealth are not using Health IT to its full capacity, as defined by evolving federal guidelines. The same study estimates that it will cost more than $438M to get all Commonwealth hospitals to achieve the stage 1 definition of meaningful use – more than half of that cost is related to training and implementation support.[24]

5.1.1. Meaningful Use Care Goals

As part of its alignment to the federal government definition of meaningful use, the Commonwealth envisions that all providers will achieve meaningful use by 2015. Although they will not be finalized earlier than summer 2010, the care goals for 'meaningful use', as included in the Notice of Proposed Rule Making, are listed below:

- Evidence based care orders, clinical protocols, alerts and reminders in support of care delivery
- Clinical decision support to reduce the number of medical errors that occur in the clinical setting; e.g. allergy checking, drug interaction checking, drug dose checking
- Automation of administrative claims and referrals processes in support of payment reform
- Enhanced care coordination through better access to information across large and small organizations, with the ability to link to an HIE to access information required for patient care that is generated from other organizations. This is in compliance with the privacy and security framework discussed previously.
- Easy and timely provision of electronic access to Protected Health Information (PHI) for patients
- Exchange of meaningful healthcare information among the healthcare team
- Automate communication with public health agencies
- Ensure there are well defined and effective privacy and security protections for protected health information
- Provide transparency of data sharing to patients
- Automated reporting of certain information through the HIE to the Department of Health, when required for purposes, such as creating a longitudinal immunization registry, disease registry, or other purposes as defined by the state; and to use comparative data to better inform providers about the quality of care

[23] Based on a recent MeHI study – Estimated Costs to Achieve Meaningful Use of Certified EHRs in Massachusetts Hospitals – Results from Spring 2009 Survey

[24] Based on a recent MeHI study– Estimated Costs to Achieve Meaningful Use of Certified EHRs in Massachusetts Hospitals – Results from Spring 2009 Survey

Given the tremendous value EHRs can bring to the health care system and confluence of new state and federal requirements and incentives, the Commonwealth is committed to accelerating EHR adoption in all settings. This can be achieved through the implementation of a federal and state funded Regional Extension Center (discussed on page 38), which will coordinate and oversee all services necessary to support providers through the adoption process. It will complement the face to face onsite services provided by the IOOs, by sharing leading tools and practices that will assist them with their clinical transformation efforts.

As the Commonwealth develops support for providers in the state, a first priority will be to develop an education, outreach and transition program for primary care physicians. The need to increase the capacity of the state's primary care physicians and to improve patients' access to care makes this provider group a logical priority within the state's plan, as well as a designated federal priority.

The hospitals in the Commonwealth have the potential to benefit significantly from the Medicare incentive program outlined in the HITECH. Therefore, MeHI is also focused on accelerating meaningful use of EHRs in the state's 72 acute care hospitals where the most critically ill patients receive care and which represent a significant portion of state health care expenditure.

5.2. Strategies for Increasing Adoption and Achieving Meaningful Use of EHRs

Aligning with the current state goals and priorities identified previously, the Commonwealth has proposed the following tactics to increase EHR adoption and meaningful use:

1. Adequate Funding
   - Promote a loan program through the Regional Extension Center
   - Endorse use of state funds, including Medicaid Funding and General Obligation Bonds
   - Provide support to providers to receive Medicare incentives
   - Expand loan program to include all types of providers
2. Build an effective Regional Extension Center (REC) Program for the Commonwealth, initially focusing on priority primary care providers.
3. Provide additional support for all other providers and provider types, by executing REC capability and capacity, for a fee.

5.2.1. Adequate Funding

Based on national studies, one of the major barriers to adopting and meaningfully using certified EHRs is the cost to acquire, implement and support an EHR[25]. To overcome that barrier, the Commonwealth and federal government are developing and/or implementing several programs to assist with some of the financial challenges associated with EHR adoption.

1. Promote a loan program

   Current research on EHR adoption nationwide suggests that upfront funding and a lack of capital are significant barriers to implementation by providers. These same barriers exist within the Commonwealth of Massachusetts. While the HITECH Act is a funding source for providers, generally speaking, the incentives are paid after the achievement of meaningful use. Therefore, MeHI will coordinate with public and private resources to establish a low interest loan program for physicians and possibly hospitals, to fund some of the upfront capital required to implement EHRs. MeHI

[25] MeHI Health Information Technology Plan: Final Recommendations, Deloitte, Oct. 14.2009.

envisions a program where the providers use the HITECH incentives to pay back the loan after they achieve meaningful use of the EHR.

2. Endorse use of State funds

   MeHI received initial funding of $15 million through Chapter 305. There is consensus however, that the initial funding will not be nearly enough to support the Commonwealth's Health IT vision. MeHI will coordinate meetings with employers, payers and others to discuss additional funding sources, one of which includes general obligation bonds. In addition, as part of the HITECH Act, significant money is being funneled through Medicaid to specifically provide additional financial assistance to physicians and hospitals that provide care for the Commonwealth's low-income population.

3. Provide support to providers to receive Medicaid incentives

   The Medicaid EHR incentive program of the HITECH Act will provide initial incentive payments to Eligible Providers (EP) and hospitals for efforts to adopt, implement or upgrade (i.e., meaningfully use) certified EHR technology. They will also provide incentive payments in subsequent years for continued meaningful use. Furthermore, the HITECH Act will provide substantial funding to States for planning activities, as they relate to administering the incentive payments to providers, auditing and monitoring of payments, and participating in statewide efforts to promote interoperability and meaningful use of EHR technology.

4. Expand Loan Program to Include all Types of Providers

   While specific provider types are not included in Chapter 305 and are not eligible for federal HITECH funding, their needs must be addressed. These providers include Behavioral Health, Home Health, Physical Therapists, Long-Term care providers, etc. While no funds are currently available, the Commonwealth will continue to work with these providers to ensure that a long-term plan is in place to assist them financially to implement the appropriate technology to support care delivery, care coordination and provide access to the planned statewide HIE.

5.2.2. Build an Effective Regional Extension Center (REC) Program for the Commonwealth

The HITECH act also provides funding to state or non-profit entities, who will assist and support providers in achieving meaningful use of interoperable EHRs. The implementation of EHRs is complex and requires a wide range of skills, including technical, clinical workflow, training and overall project management. Therefore the federal government is providing assistance to non-profit entities to support the creation of Regional Extension Centers (RECs) to provide direct assistance and best practices and tools, to assist priority providers' meaningful adoption of EHRs. RECs will initially focus on primary care physicians in the following high priority settings:

- Individual and small group practices (ten or fewer professionals with prescribing privileges) focused on primary care
- Public or not-for-profit hospitals and critical access hospitals
- FQHCs
- Entities in rural and other areas that serve predominantly uninsured, underinsured and medically underserved populations

While the REC's primary purpose is to provide federally subsidized direct support to the above priority primary care providers, all providers will ultimately be able to use the portfolio of services, best practices, and preferred vendor relations of the REC.

MeHI was notified on February 12, 2010, that is was awarded $13.4 million in funds for the first two years of an expected four year contract, to support 2,500 priority providers.

While only 2,500 priority providers will be eligible for the federally funded direct assistance services, all services delivered through the REC will subsequently be available to all providers in the Commonwealth for a modest fee. The planned fee will include both services delivered through the REC and certification from Board of Registration in Medicine (BORIM) and Medicaid to integrate with the statewide Health Information Exchange.

5.2.3. Core Services

Drawing from the work performed by MTC's CPOE initiative, the EHR deployment efforts in the private sector, the expertise leveraged through the REC/EHR Adoption Ad Hoc Workgroup and in collaboration with other Regional Extension Centers, MeHI will focus on the following core services:

- Provide orientation education: IOO 101, Electronic Health Record/Practice Management Systems 101, Health Information Exchange 101, definition of Regional Extension Center program and Health Information Exchange strategy.
- Present financing alternatives – loan program.
- Supply list of certified IOO, EHR/PMS and other vendors.
- Consolidate and aggregate practices by geography and timeframe.
- Require readiness criteria for provider pre-qualification.
- Provide standard contracts.
- Link with Massachusetts Broadband Institute (MBI) for broadband infrastructure for underserved areas.
- Create educational materials and tools for providers and consumers.
- Coordinate Community of Practice (CoP) and eLearning.
- Certify all Medicaid providers as Centers for Medicare and Medicaid Services (CMS) regulations

MeHI will enter into agreements with Implementation and Optimization Organizations (IOOs) to deliver Health IT services that will support adoption and meaningful use of certified EHRs within the physician offices. The Implementation Optimization Organizations (IOOs) will in turn contract with providers to offer a full range of adoption and meaningful use support services. MeHI believes this model provides unique benefits and efficiencies; it will permit the Commonwealth to harness the services of all of the highly experienced IOOs in the State simultaneously, thus accelerating the goal of statewide EHR adoption.

The proposed operating model enables MeHI to pursue an approach for the REC that strikes the appropriate balance between MeHI's roles and responsibilities and those of the IOOs that will be engaged at the physician practice level. MeHI Clinical Relationship Managers (CRM) will be responsible for facilitating collaboration between IOOs and the providers/hospitals, ensuring compliance with state and MeHI policies, making effective use of MeHI-appropriated funds, and monitoring provider adoption and satisfaction.

The overall provider experience will be one of choice and support. For example, the provider will receive orientation information from MeHI that enables them to select an IOO. The IOO will work with the practice to prepare for and choose an EHR vendor and support the procedural, clinical and technical requirements that will allow for meaningful use. MeHI will collaborate with the required federal agencies to obtain the funding supplement available to support the applicable services rendered to the provider.

5.3. Plans for IOO Certification and Qualification of EHR Implementations

A central certification process for IOOs is critical to the success of the Plan. As the statewide implementation PMO, MeHI will develop certification programs to assure that IOOs meet threshold criteria to offer services to providers. In addition, it is in the state's best interest to qualify EHR implementations as meeting baseline standards (e.g., privacy and security), prior to connecting to the statewide HIE. To that end, MeHI will develop the following certification/qualification programs:

- **Certification of IOOs:** MeHI will conduct a thorough review of IOOs to assess their technical and financial capabilities to perform all necessary EHR implementation and optimization services necessary to support providers in meeting meaningful use criteria. The Request for Qualification (RFQ) was issued in March 2010, and MeHI expects to finalize the list of Certified IOOs by April 2010.
- **Qualification of EHR Implementations:** Prior to HIE connectivity, MeHI will develop a program to ensure that each implementation is completed in a manner that meets or exceed the Commonwealth's standards.

Sustaining the REC is critical to the Commonwealth's strategy for accelerating Health IT implementation for all providers. Federal REC funding will begin phasing out after two years and will end after four years. As the REC becomes operational and increasingly robust, MeHI plans to supplement the projected federal subsidies with revenue from the certification/qualification programs. For example, as the HIE matures, MeHI will generate income from recertification, thus ensuring state of the art levels of privacy, security and interoperability as use of Health IT grows in the Commonwealth.

5.4. Adoption of Interoperable EHRs

All providers and provider organizations must eventually adopt interoperable and certified EHRs, so the Commonwealth can realize measurable improvements in quality, safety, efficiency and population health. However, like the federal government, the Commonwealth will first need to prioritize efforts and address specific types of providers. Once the majority of physicians and acute care hospitals have adopted EHRs, other types of health care settings or providers, such as dental, chiropractic, long term care, home health, behavioral health and pharmacy will be included in subsequent state efforts.

5.5. Overview of HITECH incentives for Achieving Meaningful Use

1. Physician/Other Eligible Professional Medicare Incentives

   Provides financial incentives for physicians and other eligible professionals beginning in January 2011. The incentives of approximately $44,000 paid over five years begin to decrease after 2012, if meaningful use is not achieved. By 2015, eligible providers that have not achieved meaningful use will be penalized through a decrease in Medicare reimbursements. Physicians and other eligible professionals cannot receive both Medicare and Medicaid incentives.

2. Physician/Other Eligible Professional Medicaid Incentives

   Provides up to $65,000 to support the purchase of an EHR and/or to partially cover the upfront costs of implementation, with some portion of that incentive potentially available to providers in advance of meaningful use. While these incentives are more generous than those provided through Medicare, they are available only to those providers serving a specified percentage of Medicaid patients (20-30% of their total patient population, depending on provider type). Physicians and other eligible professionals cannot receive both Medicare and Medicaid incentives.

3. Acute Care Hospital Incentives

   Provides financial incentives for acute and critical access hospitals, and are expected to begin in October 2010. Both Medicare and Medicaid incentives will be available, and unlike physicians, hospitals can receive both Medicare and Medicaid incentives. MeHI estimates that most hospitals in Massachusetts will be eligible for between $2 and $6 million in Medicare and Medicaid incentives, depending on their total discharge volume and payer composition. Hospitals that fail to achieve meaningful use by 2015 will be penalized through decreases in Medicare reimbursement. There are no penalties under Medicaid.

5.5.1. MeHI's Collaboration with Medicaid and Board of Registration in Medicine

MeHI is in the process of developing an Interagency Agreement with MassHealth (Medicaid), which will indicate that MeHI will provide certification services to Medicaid-eligible providers (EPs), beginning in 2011 and continuing through 2021. In addition, MeHI will be able to leverage federal matching funds to support the development of the processes and systems necessary to support the certifications.

As previously mentioned, MeHI will be the certification arm (including infrastructure and process), for all Medicaid incentives and HIE integration for the Commonwealth of Massachusetts. MeHI is in the process of developing an agreement with the Board of Registration in Medicine to provide certification services to all Massachusetts physicians, as required per Chapter 305. Details will be provided when the agreement is completed.

5.6. Next Steps

1. Continue to develop an effective Regional Extension Center (REC) program for the Commonwealth (MeHI), starting with an education and outreach program for primary care physicians and consumers.
2. Develop and/or implement several funding/loan programs to assist health care providers with some of the financial challenges associated with EHR adoption: loan program, state funds and Medicaid incentives.
3. Certification and criteria
   - Develop readiness criteria to pre-qualify providers for EHR adoption and implementation.
   - Develop certification program for IOOs and EHR/PMS vendors, and supply that list to providers.
   - Develop standard contracts to be used by vendors and providers.
   - Develop qualification criteria for EHR implementations.
   - Develop certification standards and process for all Medicaid providers.
4. Develop Interagency Agreement with MassHealth, stating MeHI will certify Medicaid-eligible providers as being eligible for meaningful use incentives, beginning in 2011 and continuing through 2021.
5. Share leading practices and tools with all providers in the state to assist them with their transformation to a certified EHR system and achieving meaningful use.
6. Accelerate meaningful use of EHRs in the state's 72 acute care hospitals.

6. Strategy 4: Statewide Health Information Exchange

While the Commonwealth believes in continually enhancing the patient-caregiver experience for each patient through the widespread adoption of EHRs, it recognizes that standalone EHRs will not lead to improving individual and population health outcomes. The critical element is the real-time exchange of health-related information through a Health Information Exchange (HIE) that supports improved care coordination, patient engagement and population health.

6.1. The Future of Health Information Exchange for Massachusetts

The Massachusetts Health Information Exchange (HIE) will offer a mechanism for patients, physicians, public health officials and researchers to access data and actionable information, to allow them to demonstrate measurable improvements in health care quality, safety, efficiency and population health. With reliable data delivered in real-time, caregivers will have an accurate view of the patient. The future of HIE for Massachusetts includes services, such as advanced patient-centric and population health-focused services that meet the broader needs of Massachusetts' citizens. The Commonwealth will be able to better identify reportable information and support quality reporting that identifies emerging health care trends. Based on the available resources, previous investments and health care stakeholder interest, Massachusetts is well positioned to make this vision a reality.

Key Points

- MeHI will coordinate the deployment of a statewide HIE to support enhancements in population health management.
- The statewide HIE will support the ability of patients to use and access their health information, and to give authorization for caregivers to access and use their health information, as well.
- The statewide HIE will facilitate the flow of health related information required for results delivery, public health, statewide disease registries and population quality reporting.

Today, the patient's care and referrals are supported by manual processes. Generating a longitudinal view of a patient's care across locations is very time-consuming and costly, and often the patient has to coordinate their own care, and make sure their health information is routed to the right care giver in a timely manner. Diagnostic tests are often repeated because each provider needs the information provided by those tests in a timelier manner than currently exists or does not have access to the patient's previous test results. Beyond the individual patient's struggles, providers and the Commonwealth struggle to develop quality reports that identify larger health care trends. With an HIE that enables and facilitates the exchange of clinical and administrative data, a patient's care will be better coordinated, and their providers and insurance company will be able to make better, more informed and faster decisions about care. Furthermore, the Commonwealth will be better equipped to identify emerging health care trends.

Building a statewide HIE, which will link the information currently captured in paper charts and unconnected EHRs, will help put the patient at the center of the health care delivery system. As the Commonwealth's health care reform initiatives move forward, a flexible HIE architecture will support models that require sharing of data across multiple sites. For example, HIE data sharing capabilities are central for a patient-centered medical home model. In the patient-centered medical home, a patient's care is delivered by teams of primary care providers, including physicians, nurses and other ancillary

providers. A fully-functioning HIE supports this model, by facilitating ready access to accurate health information.

6.2. Health Information Exchange Guiding Principles

The Health IT Council has developed the following seven guiding principles to focus the development of an operating plan for the statewide HIE:

- **Patient-centric:** The HIE will enable better longitudinal, cross-organizational care for every individual in Massachusetts and provide access to and use of health information for those individuals.
- **Adoptability:** The HIE will conform to all applicable state and federal laws, standards, policies and regulations.
- **Adaptability:** The HIE will be able to be modified and expanded to integrate new components, services, interfaces and features, as needed to accommodate more users, systems or networks.
- **Maintainability:** The standards and requirements for participating in the HIE will be as simple as possible to allow greater participation throughout the community.
- **Systems Integration:** HIE adapters and connection mechanisms will be defined and developed for all HIE participants.
- **Extensibility and Scalability:** HIE functionality will be added or updated with minimum impact to existing functions and ensure that the infrastructure is scalable.
- **Data Aggregation:** Information will be collected, transmitted and aggregated in standard, secure formats.

6.3. Current Status of Health Information Exchange in Massachusetts

Massachusetts is fortunate to have a concentration of leading universities, research organizations and public and private enterprises already engaged in health care innovation and information technology. In fact, Massachusetts has historically been at the cutting edge of thought leadership in health care and Health IT innovation. Thus, it is no surprise that a significant amount of time, effort and capital has already been invested in building several community and provider-based HIEs in Massachusetts. MeHI will leverage lessons learned from these initiatives to create a statewide HIE, which will eventually connect to a national HIE, known as the Nationwide Health Information Network (NHIN). Current participants of NHIN include Social Security Administration (SSA), Department of Defense, Kaiser Permanents, Department of Veterans Affairs, Center for Decease Control; and future participants include Beacon Communities, SSA grantees and state HIEs.

6.4. Nationwide Health Information Network

Built upon a confederation of trusted entities that are bound by mission and governance, the National Health Information Network (NHIN) provides a set of internet-based policies, standards, specifications and services that define the technical framework around which the secure and meaningful exchange/transport of health information can occur. It is comprised of a group of networked entities that facilitate information exchange with a broad set of users, systems and communities.

To oversee and support the range of activities surrounding information exchange, governance is structured to enable valid, trusted entities to participate. These entities are required to sign a trust agreement that allocates responsibility and accountability. While the federal government has played an integral role in determining the common elements of this trust agreement, the aim is to minimize the government's role as these common elements expand over time to accommodate the evolving spectrum of information.

To maintain privacy and security as a first priority, information exchange will need to be broadened over time. The work being done in 2011 for state and enterprise level information exchange should not inhibit the possibility of more robust information exchange in 2013 and 2015. In other words, while existing and new exchanges will be fostered, support for increased interoperability will be expanded.

The future vision for NHIN has been officially endorsed by the Health IT Policy Committee, and ONC is developing a strategy to catalyze this vision by focusing the following:

1. Creating a light weight "on ramp" for providers and consumers to enable information exchanges and meaningful use
2. Gathering input on how to achieve this vision
3. Focusing on real needs and real value
4. Identifying next steps and partners to achieve this vision

6.5. Collaboration and Coordination within Massachusetts

The existing high level of collaboration and coordination among entities in Massachusetts will allow MeHI to build on the depth and breadth of HIE expertise in the Commonwealth. Examples of existing HIEs include the following:

Initiative	Description
Northern Berkshire eHealth Collaborative	Participated in a payer funded pilot program conducted by the MAeHC. It is sending some communicable disease data to the Massachusetts Department of Public Health (DPH) through a state intermediary that manages the data. Represents a community of small physician practices, all on one EHR, using a community level consent strategy. The HIE is hosted centrally at the community hospital.
Newburyport	Participated in a payer funded pilot program conducted by MAeHC. Challenges with HIE integration have been encountered. Represents a community of small physician practices with multiple EHRs, including but not limited to eClinicalWorks, NextGen and GE Centricity. The HIE is hosted centrally at the community hospital and uses an individual consent strategy.
SAFEHealth	HIE between Fallon Clinic and Health Alliance in a federated architecture.
Community Hospitals and Physician Practice Systems (CHAPS)	Clinical data exchange between the South Shore Hospital Meditech EMR and the Atrius Health System EpicCare. Represents a federated-decentralized model for data sharing.
New England Healthcare EDI Network (NEHEN)	Providers connected to payers through frame-relay, VPN or HTTPS. Sends and receives patient data in real-time or in batch through a distributed, peer-to-peer network.
Commonwealth of Massachusetts HHS Enterprise Service Bus	Connects several HHS agencies and provider organizations. Enterprise Service Bus uses service oriented architecture for real time, web services based health transaction exchange.

As previously noted, HIEs can occur at the community (including hospital networks), state, regional (across states) or national levels. The various types of HIEs provide the following capabilities and value:

- Community level primarily supports patient care and coordination.
- Statewide supports public health and quality reporting.
- Regional HIE supports patient care coordination, public health reporting and biosurveillance.
- National level supports secondary uses of data for public health and quality reporting.

As noted in the previous table, the majority of HIEs in the Commonwealth are at the community level. However, they will be leveraged to develop a statewide HIE. The primary focus of funding available in the Commonwealth of Massachusetts will be for development of the statewide Health Information Exchange.

On February 12, 2010, MeHI/MTC received a notification of grant award for $10.6 million, for both the development of an HIE Operational Plan and the implementation of a statewide HIE. While the $10.6 million reflects a significant level of funding for the deployment of a statewide HIE, it will not be sufficient over the long-term. Additional funding options are being considered and will be included in the HIE Operational Plan, due to be completed by August 31, 2010.

The development of the statewide HIE will include the following steps.

- Ensure MeHI has a full inventory of existing HIEs in the state and an understanding of their potential to contribute to an operational State HIE.
- Develop the HIE operational plan, expected to start in March 2010.
- Leverage Ad Hoc workgroups to support planning efforts.
- Issue RFI to HIE vendor/vendors to inform them of the planning process.
- Competitively procure vendor/vendors to develop and operate a statewide HIE.
- Evaluate options for long-term financial and operational sustainability.
- Establish appropriate governance structure.
- Coordinate with Privacy and Security workgroups to provide recommendations on a common privacy and security framework and certification.
- Create certification process for provider access to statewide HIE.
- Address a broad range of issues related to the HIE, including interstate information exchange and plans for connecting with the NHIN.

6.6. Health Information Exchange Meaningful Use Capabilities

The deployment of HIE services will be phased. While aligning with the federal meaningful use requirements, the Commonwealth has identified a number of capabilities the statewide HIE will provide. As the statewide HIE is built, MeHI will leverage the successes and lessons learned from the variety of ongoing efforts in the Commonwealth, to make necessary changes in prioritization of these services, as necessary. MeHI has prioritized a core set of services to be supported by the statewide HIE including (1) administrative simplification, (2) electronic prescribing and refill requests, (3) electronic clinical laboratory and results delivery, (4) electronic public health reporting, (5) quality reporting, (6) prescription fill status and/or medication fill history, and (7) care coordination/clinical summary exchange.

6.6.1. Priority Services for Statewide HIE

Capability	Description	Massachusetts Status
Administrative Simplification	HIEs provide an opportunity to simplify administrative functions and minimize their costs, such as eligibility inquiries, electronic claims submission, and consent information, such as authorizations.	Vendor-specific solutions and NEHEN support electronic eligibility transactions, claims submission transactions with multiple health plans, including Tufts, Blue Cross Blue Shield of MA, Boston Medical Center HealthNet Plan, Network Health, etc.
Electronic Prescribing and Refill Requests	Electronic transmission of a prescription from the physician's office to the pharmacy	For three consecutive years, Massachusetts has the highest national percentage of electronic prescriptions[26].
Electronic Clinical Laboratory Ordering and Results Delivery	Electronic transmission and request for clinical laboratory ordering and delivery of patient lab results, for use in clinical care	48% of hospitals have CPOE systems. Approximately 40% of physicians use ambulatory EHR[27].
Electronic Public Health Reporting	Automated data reporting to the Department of Health, to increase the completeness, accuracy and breadth of public health and chronic disease management reporting.	Twenty-five hospitals send infectious disease results to the Department of Health. Three reportable data detection and messaging pilots successfully transmitted data. Seventeen hospitals electronically report demographic and clinical data that are analyzed to detect possible outbreaks or clusters of illness[28].

[26] MeHI Health Information Technology Plan: Final Recommendations, Deloitte, Oct. 14.2009.
[27] Simon et al., 2009, Physicians' Usage of Key Functions in Electronic Health Records from 2005-2007. Journal of the American Medical Informatics Association.
[28] MeHI Health Information Technology Plan: Final Recommendations, Deloitte, Oct. 14.2009.

Capability	Description	Massachusetts Status
Quality Reporting	Set of services that leverage data through an HIE, and provide public and provider organizations with information for initiatives, such as pay for performance or trend reporting.	Masspro (State's Medicare Quality Improvement Organization) works with 92 providers in 17 provider organizations to improve quality reporting from their EHR systems. MassHealth (State's Medicaid program) administers the Primary Care Clinician Plan's quality improvement program, providing a Care Monitoring Registry, Reminder Reports. The Massachusetts Health Quality Partners (MHQP) 1) identifies the importance of comparable measures for better improvement, by supplying reliable information that helps physicians improve the quality of care they provide their patients and helps consumers take an active role in making informed decisions about their health care[29], and 2) reports quality measures for 150 ambulatory groups.
Prescription Fill Status and/or Medication Fill History	Providing historical information from the pharmacy directly to providers at the point of care, when requested.	SureScripts prescribing network linkage operational at many provider organizations, but not uniformly adopted by all providers using an EHR.
Care Coordination/Clinical Summary Exchange	Sharing of clinical summaries through a standard format called Continuity of Care Documents (CCD), to facilitate improved care coordination and care across organizations.	Pilot implementations, some of which are currently using the standardized CCD format.

While the above services will be implemented as a top priority for the Massachusetts HIE, there are several other services that must be considered during the infrastructure design process. These additional services are listed on page 48. Although they have yet to be developed, some are directly or implicitly mandated by requirements in Chapter 305 and the HITECH Act. While most have been identified as valuable services by MeHI and private sector focus groups, those not required will have to be studied in terms of the cost of implementation, as well as the potential impact on timeline.

[29] Massachusetts Health Quality Partners, http://www.mhqp.org/default.asp?nav=010000, 2010.

6.6.2. Additional Services Considered for the Statewide HIE

MeHI will consider the cost of adding the following valuable services when selecting an IOO to support the HIE:

Service	Description
Connection to a Nationwide Health Information Network (NHIN)	A set of services that allows stakeholders to connect to data seekers and data providers by connecting to a national "network of networks," thereby enabling health information exchange to occur at a national level.
Patient Identifier Services	A methodology and related services used to uniquely identify an individual person as distinct from other individuals and connect his or her clinical information across multiple providers.
Record Locator Services	A mechanism for identifying and matching multiple patient records together from different data sources.
Audit Trail Services	A mechanism for tracking when, where and what data was accessed and who accessed the data through an HIE entity (mandated).
Cross-Enterprise User Authentication Services	A mechanism for identifying and authenticating clinical system users to validate their right to access clinical information based upon privacy rules, patient consent and individual user and organizational roles.
Portal	A web-based service offered to participants for accessing, viewing and downloading data available from sources connected to an HIE (mandated).
Terminology Services	A service that ties together technology, nomenclature, data-element or coding-transactions standards across disparate systems, normalizing (among others) HIPAA-standard transaction sets including HL7 and ANSI, LOINC, SNOMED CT, RxNorm, ICD, NCPDP, HCPCS, CPT, and document terminology.
Patient Consent Management Services	A process for defining levels of patient consent and tracking those consents and authorizations to share protected health information through an HIE entity.
De-identification Services	A mechanism for removing demographic and other person-identifying data from protected health information and other health care data so that they can be used for public health reporting, quality improvement, research, benchmarking and other secondary uses (required).
Data Transformation Services	A mechanism for facilitating the intake of data in multiple formats in real time, through the use of an integration engine, which transforms the data into a useable format.
Advance Directives Management Services	A set of services that maintain and exchange a patient's legal documentation such as a living will, durable power of attorney for health care, etc.
Patient Registry Connectivity Services	A set of services that establish group purchasing or licensing agreements for, and assist with implementation of electronic health record applications for interested providers.
Clinical Decision Support Services	A mechanism for distributing standardized clinical rules that can be incorporated into electronic health record systems or e-Prescribing systems, in support of clinical decision making at the point of care.
Personal Health Record Exchange Services	A mechanism for facilitating the electronic delivery of protected health information to individual patients' personal health records, to leverage Decision Support Services.

6.7. Health Information Exchange Technical Architecture

To ensure that statewide HIE can deliver on the Health IT vision, MeHI has defined specific concepts that underlying technical architecture must support:

- **Principles of the Federal Privacy Framework:** Patient control of information on the HIE must be consistent with state and federal policy.
- **Public Health Reporting:** The HIE must integrate with a reportable data detection and messaging solution to drive improved completeness and accuracy for public health reporting.
- **Reporting for Quality and Other Initiatives:** The HIE must facilitate data routing to reporting tools and support future linkage to public health registries; e.g., immunization.
- **Bi-directional Data Exchange:** HIE participants, including patients, must be able to contribute, share and retrieve data (subject to consent).
- **Exchange of Standardized Clinical Data Summaries:** The HIE must adopt and support the standards needed to exchange and summarize data among various clinical settings.
- **Financial Sustainability:** The HIE must provide value to participants, such that they are willing to pay for the services provided.

6.7.1. Massachusetts HIE: A Hybrid Model

There are three potential technical models for the Massachusetts HIE: centralized, federated, and hybrid. MeHI selected a hybrid model, which uses both centralized and distributed data repositories, depending on the data. This model combines features from the centralized and federated models.

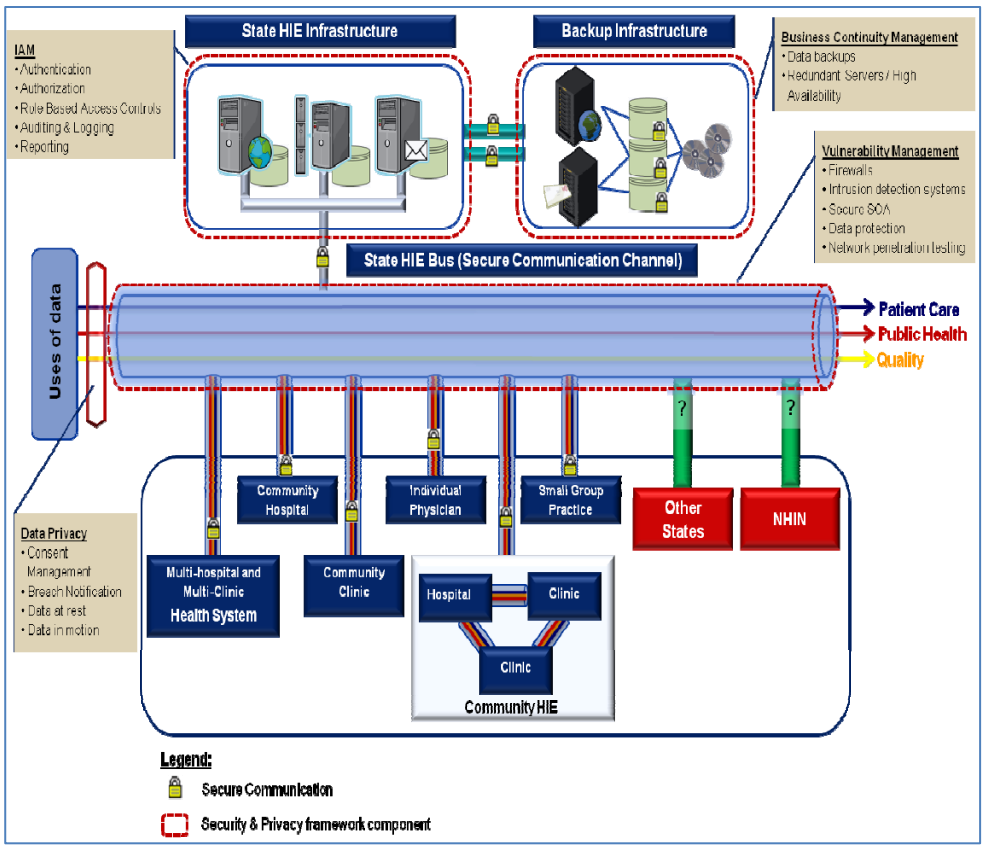

Figure 6.1 Hybrid Model

Under the hybrid model, most of the HIE will be federated, where the majority of data remains in the health care systems, where it was created. The HIE will centralize data only when necessary to support specific uses, such as public health and quality reporting, and overall population health tracking and management. For example, MeHI may decide to facilitate pharmacy transactions through a federated model but consolidate lab data into a centralized database. Providers in a hybrid architecture may decide to share patient data through the statewide HIE, or through a centralized data repository or with peer-to-peer tools. Depending on the specific configuration, a master patient index will be used to link patient records across the participant databases. In this way, data can be presented to users in an integrated, patient-centric manner, employing a common user interface, regardless of where the data actually reside.

6.8. Health Information Exchange Financing and Sustainability

As mentioned previously, sustaining the statewide Health Information Exchange (HIE) will require support from both the public and private sectors. In its role of coordinating the statewide HIE implementation, MeHI will also develop the sustainability plan, under the guidance of the Health IT Council, with strong support from the HIE Ad Hoc Workgroup. The Health IT Council will seek further recommendations from the other Ad Hoc Workgroups, as needed.

In 2008, in addition to funding received through the ONC, MeHI received initial funding of $15 million through Chapter 305. The public sector funding is intended to seed the initial development of a statewide HIE, so neither state nor federal funding should be viewed as a primary or ongoing source of funding. MeHI estimates that the full cost of implementing the statewide HIE over a four year period is approximately $45 million. The planned request for information (RFI) for the HIE implementation will bring greater clarity to this figure.

Ad Hoc Workgroups will provide advice on the sustainability, based on value that stakeholders derive from HIE. Decisions concerning the long term business model for Massachusetts HIE will be made according to the Governance model described in Chapter 2. In its role as the Health Information Organization and in collaboration with key stakeholders, MeHI will contract directly with the IOOs, to operate and govern the HIE. It is anticipated that sustainability will be assured through the investment of public and private funds, commensurate with the value that will accrue to these entities.

6.9. Engaging Patients and Consumers in Secure Health Information Exchange Environment

Engaging patients and consumers in a secure HIE environment is critical to the success of Health IT and to health care reform. For patients, engagement means using technology to actively participate in their health care and health care decision making, based on their own individual preferences and values. The benefits of Health IT use for patients and consumers include easy access to, and use, control and portability of their health information; increased efficiency; the avoidance of potential medical errors or complications; and increased partnering with their clinician to improve the their overall health and quality of care. A critical component is the patient's confidence that their information is private, secure and used only as specified. The Commonwealth's approach to securing the HIE begins with an "end to end" security framework linked to the various legal and regulatory requirements.

Each of these benefits is important to the individual, and each can benefit from the broader community, through lower aggregate illness burdens and medical costs. As technology continues to evolve, there will be more opportunities to engage the patient/consumer in their care, and to change and enhance the nature of communications between and among patients/consumers and clinicians.

Engaging patients and consumers in Health IT, while protecting their privacy, requires giving patients the ability to add to and modify their own records, as well as meaningful control over who views or shares

their records. Leading researchers in the field of health informatics point to the fact that consumers are already managing their own bank accounts, investments and purchases online. Those same consumers will expect a similar level of control with their personal health records.[30]

While consumers should always look for opportunities to enhance communication with providers through interactions not involving technology, we should also recognize the potential value consumer-empowering technologies can bring. As the Commonwealth works to achieve its vision of a state "where, as a result of statewide deployment and adoption of Health IT, the Commonwealth of Massachusetts is thriving, as it demonstrates measurable improvements in health care quality, safety, efficiency and population health" patients and consumers also have important roles to play, as active, engaged participants in their own health care.

6.10. Coordination with Medicaid

In 2008, Chapter 305 was passed by the Massachusetts Legislature, creating both MeHI and the Health IT Council. The Health IT Council, as described in Chapter 305, should consist of nine members, which include the Secretary of EOHHS, who also serves as the chair of the council; the Director of the Office of Medicaid; Secretary of Administration/Finance; the Executive Director of Health Care Quality and Cost Council; and five Governor appointees. Since the creation of these two entities, the Office of Medicaid has been actively involved in MeHI's governance and health IT planning.

Primarily, Medicaid (MassHealth) provides comprehensive health coverage to nearly 1.24 million eligible low-income children, families, people with disabilities and seniors, throughout the Commonwealth. In addition, EOHSS is working with a broad group of stakeholders to establish a Patient Centered Medical Home (PCMH) delivery model of care across all payers, for which EOHSS has received initial funding from the Commonwealth. This delivery model would involve transforming Community Health Centers into patient-centered medical homes over a four-year period. A demonstration target group of Primary Care Providers, with approximately 50,000 plan members, is in development, with an implementation date set for some time in 2010. The goal is to expand the PCMH delivery model to all providers, statewide, over the next few years.

For both MeHI and MassHealth to be successful, there needs to be close coordination of activities, which will be beneficial to both, in a number of ways. Both entities will be able to optimize the available state and federal funding, by aligning the State and MassHealth IT strategies and planning, using MeHI, EOHHS/MassHealth staff and the relevant Ad Hoc Workgroups, as content experts. State Health IT assets and stakeholder involvement will be used efficiently across MeHI and EOHHS/MassHealth initiatives, including sharing of stakeholder contact lists, coordination of stakeholder communications, and coordination of Health IT Workgroups.

MeHI and Medicaid (MassHealth) are currently collaborating to ensure the objectives of each entity are in alignment, which includes the following:

- State Health IT Strategic Plan and Chapter 305 objectives are tightly aligned with CMS Medicaid Health IT incentives.
- Medicaid Health IT funding is put forth towards achieving the adoption and meaningful use goals of Chapter 305 and the HITECH.
- Advance the adoption and meaningful use of Health IT, which is critical for the support of the statewide, all payer PCMH initiative.

[30] Mandl, Kenneth D., Peter Szolovits, and Isaac S Kohane. "Public Standards and Patients' Control: How to Keep Electronic Medicaid Records Accessible but Private." *BMJ,* February 3, 2001.

- Align MeHI's focus of IOO support for Primary Care Providers, Nurse Practitioners and Community Health Centers with the Commonwealth's commitment to supporting and enhancing primary care, as MeHI IOO certification will be instrumental in encouraging rapid adoption of Health IT by MassHealth providers.

To solidify this collaboration, an Interagency Service Agreement (ISA) is being developed between MeHI and MassHealth for data sharing; planning and system design; EHR certification support for MassHealth providers; and IOO support for MassHealth primary care providers. Indications of this relationship have already been seen in the following ways:

- They both participate in regularly scheduled Health IT Council Meetings.
- They both participate in the MassHealth Health IT Steering Committee, focusing on developing and implementing ARRA-funded Medicaid Health IT Incentive Payments.
- Key Health IT documents and deliverables are developed and reviewed by each entity.

6.11. Next Steps

1. Develop and implement HIE Operational Plan
2. Procure HIE vendor(s) to develop and operate a statewide HIE.
3. Create certification process for provider access to statewide HIE.
4. Develop HIE sustainability plan.
5. Coordinate the statewide HIE implementation with new HIE governance structure.
6. Formalize integration of Health IT efforts with the state's Medicaid program.

7. Strategy 5: Create Local Workforce

The HITECH Act and Chapter 305 will motivate providers to move forward with unprecedented demand for Health IT products and services over the next several years. Greater availability of electronic health data through use of Electronic Health Records and Health Information Exchange should facilitate exponential growth in research opportunities, public health initiatives, and technologies that will translate this data into new groundbreaking approaches to healthcare; i.e., translating genomic information into individualized diagnostic and treatment plans.

Both the American Medical Informatics Association (AMIA) and the American Health Information Management Association have been actively researching, defining and advocating for a workforce that can meet all of these demands and opportunities. With a concerted effort to educate a Health IT workforce and include health informatics in the basic educational programs of all health related professionals, the promise of Health IT to improve the health of the nation while constraining costs could be realized.

Key Points

- There is an increased demand for skilled workers for Health IT implementations to help organizations train users and move their processes to the new technologies.
- There will be increasing demand for Health IT proficiency in the health related industries in the Commonwealth.
- Existing training programs do not meet the skill and competency needs for Health IT workers.
- MeHI will coordinate the use of existing state and federal initiatives to develop training programs targeted to meet the need for specific Health IT skills.

7.1. Workforce Demands and the Commonwealth

The health care industry is already the largest employer in Massachusetts, with 458,965 jobs in 2005 (14.5% of total state employment). The industry generates $29 billion in revenue through 19,158 establishments (teaching hospitals, regional hospitals, community clinics, ambulatory services, doctor and dentist offices, home health care, outpatient services and laboratories). It is estimated that through 2016, 64,630 new healthcare jobs will be created in the Commonwealth. Each of these jobs, from office receptionist, to home respiratory therapist, to neurosurgeon, to billing specialist will require some degree of expertise in the use of Health IT.

The Commonwealth of Massachusetts has a large and established biotechnology industry. At 18% of the state's GDP and approximately $65 billion in revenue, technology is the state's second largest industry. Roughly 10,300 firms directly employ 178,323 workers and support another 290,122 jobs in the state. Massachusetts also has the greatest number of institutions of higher learning per capita in the US, including several academic medical centers, creating demand for researchers and research assistants fluent in Health IT.

Investment in curricula and programs to educate and train both existing and new workers in the fields of healthcare, biotechnical development, research and public health will achieve the dual purpose of meeting workforce demand, while providing job opportunities for those who are currently unemployed, under employed, dislocated or displaced. Development of a local workforce to support Health IT related initiatives is a key strategy in meeting the overall goals and objectives of widespread adoption of health information technology.

7.2. Current Workforce State

Organizations throughout the healthcare industry are facing obstacles that must be addressed, if they are to meet the challenge of achieving meaningful use of EHR systems by 2015. Employers lack change management capabilities. They also face a high turnover rate in key staff areas, lowering their return on investment in workforce development, and are finding that the top talent is being heavily recruited by other organizations in the field. Educational institutions do not have faculty trained in this growing field, and are having problems recruiting students into the health IT field of study. Finally, both lack the funding to adequately train talent or hire qualified talent to meet workforce demands and are finding that a common language around EHR and health IT does not exist.

Today, the talent that is most in demand and hard to find in the health IT industry are those with healthcare awareness, clinical experience, communication skills and knowledge of information technologies. There is currently a large availability of workforce talent in the marketplace. However, this talent does not posses the training/knowledge to meet the needs of healthcare employment organizations – workers with combined skills in both information technology (IT) and healthcare. Specific areas of need include system implementation and integration support, project management, data specialists, systems training, education and outreach. The areas of greatest immediate need are implementation, project management, practice consultant and data management.

To grow their health IT teams to meet Chapter 305 and HITECH requirements, health IT employers are looking both internally and externally to fill positions. Additionally, if they are to fill these positions within a six month period, they may need to focus on individuals with proficiency in either IT or healthcare: the IT professional outside the healthcare industry looking for a career change or a healthcare professional outside IT looking for a career change. In both cases, employees will need to supplement their lack of experience with education and training.

7.3. Short Term Needs

To fulfill the ambitious goals of HITECH and Chapter 305, a range of health care and technology related skills will be needed in the near term. In addition to installing the technological infrastructure, a skilled workforce will be needed to integrate these tools into care delivery processes in the doctor's offices, hospitals and other settings. These workers will help health care organizations to modify their current processes, to incorporate the new technology and train providers and hospital staff to use the information that becomes available. This will improve the quality of care and improve efficiency, thereby, decreasing total costs.

Given the aggressive schedule for deployment of EHRs, the immediate need for qualified Health IT talent and the availability of ARRA funds to support Health IT training, MeHI will coordinate with key stakeholders to focus on developing competencies to support the mission of the Regional Extension Center program. Specific roles were defined by an ONC Workforce Technical Expert Workshop in August, 2008 and included a clinician consultant, implementation manager, implementation support specialist, practice workflow and information management redesign specialist, technical/software support and trainer. MeHI will immediately employ the following tactics to meet these short term needs.

- Coordinate with local community colleges and employers to ensure Health IT curricula are developed.
- Provide workforce development specialists who can train staff at community based or regional implementation support sites.
- Set up an online community of practice that can provide updates, tools and educational modules to be used by practice consultants and the clinicians they support.

- Set up an online patient/consumer community site that provides education and information about topics of importance to the group.

7.4. Medium Term Needs

As noted previously, the current health care workforce extends far beyond the professionals and staff in a physician's office. On the job training, continued education programs and certification programs in Health IT proficiency will need to be developed and offered by a wide range of university and community colleges. Current workers will need to be persuaded to acquire this knowledge and advance their careers. To further these approaches, MeHI will be working with a regional consortium that will be funded by the Office of the National Coordinator (ONC), to develop curricula and to train current and new workers in the basics of Health IT use.

To train the workforce that will fill the employment gap, the following Health IT-based training programs are being considered:

1. Health IT Community College Consortia – Rapidly create health IT education and training programs at the Community Colleges or expand existing programs. Community colleges funded under this initiative will establish intensive, non-degree training programs that can be completed in six months or less.
2. Program Assistance for University-Based Training – Rapidly increase the availability of individuals qualified to serve in specific health information technology professional roles requiring university-level training.
3. Competency Examinations – Provide $6 million in grants to an institution of higher learning to support the development and initial administration of a set of health IT competency examinations.
4. Curriculum Development Centers – Provide $10 million in grants to institutions of higher learning to support health IT curriculum development.
5. Employment/Training Administration Program – Provide grants for training and placement services for workers to pursue careers in health care and other high growth and emerging industries.

7.5. Long Term Needs

Ultimately, all professional educational programs leading to degrees, such as Registered Nurse, Bachelor of Science in Nursing, Doctor of Medicine or Osteopathy must include in their curricula, coursework in medical informatics and health information technology. Likewise, all programs leading to certification in some field of medicine, such as lab technician, radiology technician or licensed social worker will need to include education related to Health IT. Lastly, courses specific to medical informatics will be needed in both Bachelor's and Master's degree programs that prepare students for careers in public health, research and biotechnical development. Given the large number of academic institutions in the Commonwealth, there is significant opportunity to coordinate these efforts, so the needed educational content is available as soon as possible, and made widely available for incorporation into existing programs. To better understand the specific needs in health IT organizations, MeHI convened two Workforce Advisory Workgroups who met over a one-week period: one for employer organization and one for educational institutions. The following is a breakdown of the objectives and findings of each focus group.

7.5.1. Objectives

Employer Organizations	Educational Institutions
▪ Define the current and anticipated talent gaps. ▪ Identify competencies that are difficult to recruit. ▪ Gain an understanding of current internal training efforts and opportunities within the organizations.	▪ Gain an understanding of existing curricula and program capabilities. ▪ Identify qualities of successful graduates. ▪ Understand current challenges in managing and growing development programs.

7.5.2. Findings

Employer Organizations	Educational Institutions
Employers face three key issues, as they address the changing needs of health IT. **Timing** ▪ The need for skilled workers is immediate – trained and on the job within six months. ▪ Most of the workforce need is viewed as temporary – few are expected to remain after the implementation period. **Skill Gaps** Applicants for the most difficult roles to staff require a mix of the following three skills: ▪ Healthcare knowledge ▪ IT technical skills ▪ Change management experience **Economics** Organizations do not have funding to spend on training and have difficulty affording talent that is currently trained.	A number of certification and degree programs are currently preparing students in Massachusetts for a career in health IT. These Programs focus on meeting the key skill gaps in the industry, including healthcare, IT and change management. Some programs are built to address all three of these skill gaps, while others are focused on one or two skills. **Certifications/Degrees** Certifications available today include Associate's, BS, MS, PhD, and Certificate, among others. **Duration** 1-4 years – variance is due to the certificate versus degree programs. **Structure** Variety exists between blended online and in-person curriculum. Many have virtual e-learning and webinar opportunities. **Employer Partnerships** Apprenticeships; e.g., Labor, UMASS Lowell, Middlesex, Year Up

7.6. Federal Funding and Support

The Federal Government has recognized the need for investment in workforce development with respect to Health IT and has made available a number of grant opportunities through the ARRA.

- Health Information Technology Research Center will make curriculum and training available by August 2010 for 1500 Regional Extension Center staff.
- The Regional Extension Center has been directed to work with community colleges to develop curricula that train staff to meet the needs of an expanding REC program.
- Curriculum Development Centers will be funded to quickly and efficiently meet the needs of the Community College Consortia.
- Community College Consortia will be funded to provide six-month educational programs.

The availability of these federal funds and programs provides a unique opportunity for the Commonwealth, including the rapid development of a Health IT workforce that will meet the immediate need for Health IT deployment in the delivery system, while positioning the state to develop the necessary Health IT expertise for stable, high-paying employment in the future, commensurate with the needs of our healthcare and biotechnological development communities.

7.7. The Future

MeHI will continue to collaborate with employers and education and training organizations to ensure that the Commonwealth is developing the workforce needed to meet future demand for Health IT-experienced professionals. MeHI will also track the success of training and development programs at meeting the demand for qualified workers and assess other emerging skills and workforce needs that develop as circumstances change. The Workforce Development Ad Hoc Advisory Workgroup will serve as a forum to facilitate discussion and coordination among the many stakeholders who have need for a workforce proficient in Health IT.

7.8. Next Steps

1. Short-term
   - Contract with IOOs who currently have a professional workforce to support EHR adoption in physician offices while training additional staff through the Health Information Technology Resource Center (HITRC) program.
   - Coordinate with community colleges and employers to develop Health IT curricula leveraging the Workforce Development Workgroup.
   - Provide workforce development specialists who can train staff at community based or regional implementation support sites.
2. Medium term
   - Through the Health IT Community College Consortia, rapidly create health IT education and training programs at the Community Colleges or expand existing programs. Community colleges funded under this initiative will establish intensive, non-degree training programs that can be completed in six months or less.
   - Using program assistance for university-based training, rapidly increase the availability of individuals qualified to serve in specific health information technology professional roles requiring university-level training.
   - Consider providing grants for training and placement services for workers to pursue careers in health care and other high growth and emerging industries.
3. Long term – Include in the educational programs leading to Bachelor's and Master's degrees and certification programs, coursework in medical informatics and health information technology.
4. Ongoing – Continue to collaborate with employers and education and training organizations to ensure the Commonwealth is developing the workforce needed to meet future demands of Health IT-experienced professionals.

8. Strategy 6: Monitoring Success

As outlined in the previous chapters, Health IT will be an enabler to the Commonwealth's efforts to reform health care. Despite all the promises of Health IT, there are significant examples throughout the nation of other Health IT projects that are delayed, over-budget or fail altogether. As a result, the Commonwealth will develop a portfolio of measures and milestones, such that the progress against the Health IT Strategic plan can be understood and shared with all stakeholders, including the public. By measuring the progress, it will be possible to identify areas where Health IT is having an effect, learn from the experiences and variations in Health IT implementation and adoption, and create a health care system that will continually improve over time.

As part of MeHI's role as the PMO and coordinator of the State Health IT Strategic Plan (previously discussed in the chapter 3), it will be responsible for the management of collecting data, aggregating data from multiple sources, and periodically reporting the status of measures. While systematic measurement of the progress and results of a statewide Health IT Strategic Plan is recognized as important, no specific measures for the initiative have yet been finalized. To address the final measures, a specific Ad Hoc workgroup will be identified to advise the Health IT council and MeHI on the data to be included in a comprehensive performance measurement program. The Health IT Council will have final decision making authority over the final performance measurement program, which could potentially include the following components:

Key Points

- The key to achieving the Commonwealth's vision is the ability to measure the progress of the Health IT Strategic plan.
- Need to measure performance against the requirements of the REC and HIE Cooperative Agreements, and the Workforce Development Grant.
- Align with the existing outcomes and quality metrics already being defined as part of the HCQCC efforts, to understand Health IT impact on broader health reform.

1. Continuous periodic evaluation and reporting, which recognizes the success of the approach for the implementation of this Health IT Strategic Plan.
2. Reporting requirements that align with federal programs, such as the Regional Extension Center and HIE Cooperative Agreements.
3. Aligning with the existing outcomes and quality metrics already being defined, as part of the HCQCC efforts to understand Health IT's impact on broader health reform.

8.1. Health IT Strategic Plan Success Measurements

The Commonwealth will be developing performance measures that directly align with the State's Goals and Objectives identified in the introduction:

Goal 1: Improve access to person-focused health care.

Goal 2: Improve the quality of health care delivery across all providers.

Goal 3: Improve efficiencies in the health care system and slow the growth of health care spending.

Goal 4: Improve population health.

Goal 5: Improve focus on disease prevention and health promotion.

Goal 6: Improve patient engagement in their health, health care and health management.

Particularly important for an initiative, such as the State's Health IT Strategic 2010 Plan that is incremental and spans several years will be to set interim milestone targets. While the final measures will be determined by the Health IT Council, the responsibility for the management of the performance measurement program will fall under MeHI. MeHI will leverage tools, such as project and data management software, to track and monitor progress of key activities, status of Health IT adoption and other metrics. There will need to be multiple mechanisms to collect the data necessary to accurately track progress towards the state's vision and goals. MeHI fully expects it will also need to use patient and physician surveys to collect some of the metrics needed to report against the broad nature of the state's Health IT Objectives. Sections 8.2 through 8.4 are illustrative examples that could potentially be included in the final performance measurement program approved by the Health IT Council.

8.2. Grant Commitment Requirements

As part of its participation in federal funding opportunities, the Commonwealth will need to include specific reporting measure in its overall performance measurement program. The final list will be defined as part of the grant award process and the operational planning effort. Some examples are Financial Reports, Progress Reports, Audit Reports and HIE Domain Reporting, such as Governance, Finance, Technical Infrastructure, Business and Technical Operations, and Legal/Policy.

Chapter 305 mandates that, by January 1, 2015, EHRs be implemented in all provider settings and integrated through a robust HIE. Process adoption measures can provide all constituents (state, federal, taxpayer, provider, consumers, payer, etc.) with timely information on the progress of that initiative. Initial process adoption measures could also include those that are required to demonstrate eligibility for federal or state funding. For example, the initial metrics could support the REC, which will be required to track the following information:

- Providers who have signed contracts with IOOs to assist with implementation of their EHRs
- Providers who have implemented an EHR
- Providers who have achieved meaningful use
- Patients who have accessed and used their health information electronically

Similarly, Federal HIE funding requires that the Commonwealth track the following information:

- Percent of providers participating in HIE services that are enabled by statewide directories or shared services
- Percent of pharmacies within the state that are actively supporting electronic prescribing and refill requests
- Percent of clinical laboratories within the state that are actively supporting electronic ordering and results reporting

8.3. Outcome and Quality Measures

The implementation of Health IT is only one of the enablers being pursued by the Commonwealth to decrease costs and increase safety and quality. To this end and to prevent confusion and challenges associated with multiple reporting requirements, it will be important for the Commonwealth to align and synchronize the collection and analysis of performance measures across initiatives. This is especially true for metrics focused on tracking the impact on utilization, outcomes and quality measures. For example, the HCQCC is charged with developing a state roadmap for cost containment. As part of that effort, they are formulating a strategy to monitor overall health care system performance, including measurement and evaluation of the impact of multiple policy changes on containing costs and improving quality. HCQCC's responsibilities include publishing a scorecard that will track aggregate measures of cost, quality and efficiency. Examples of metrics include changes/reductions in the following:

- Emergency room usage
- Hospital readmission rates
- Hospitalizations
- Hospital-acquired infections
- Serious reportable events
- Per person end-of-life spending
- The growth of Medicaid spending for nursing facility services
- Health indicators such as diabetes and asthma control

As MeHI defines the metrics it wishes to track related to utilization, outcomes and quality, it will work closely with HCQCC and other state initiatives, such as the Patient-Centered Medical Home Initiative and the Disparities Council, to align its metrics with others being collected. Furthermore, MeHI will consult with the Performance Measurement Alignment Expert Panel, convened by the Secretary of Health and Human Services, to ensure consistency in definitions and collection methods across programs and initiatives.

8.4. Performance Measures for Meaningful Use

The Office of the National Coordinator (ONC) has defined three types of requirements for meaningful use: (1) Use of certified EHR technology in a meaningful manner (for example, electronic prescribing); (2) that the certified EHR technology is connected in a manner that provides for the electronic exchange of health information to improve the quality of care; and (3) that, in using certified EHR technology, the provider submits to the Secretary information on clinical quality measures and such other measures selected by the Secretary[31]. While the final definition of Meaningful Use is still pending, the Health IT Meaningful Use workgroup, directed by the Health Information Technology Policy Committee (HITPC), will provide recommendations to ONC and Secretary of Health and Human Services for the initial definition of Meaningful Use, with subsequent revisions to the definition in 2013 and 2015. Once defined, providers will be required to achieve meaningful use and report to the CMS or the State's Medicaid agency, who will monitor their meaningful use. The following are specific examples of criteria for meaningful use:

1. Improve quality, safety, efficiency and reduction of health disparities.
    - Provide access to comprehensive patient health data, for patient's health care team.
    - Use evidence-based order sets and Computer Physician Order Entry (CPOE).

[31] Federal Register: January 13, 2010 (Volume 75, Number 8), p 1850 http://edocket.access.gpo.gov/2010/E9-31217.htm.

2. Engage patients and families in their health care, by providing patients and families with timely access to data, knowledge and tools to make informed decisions and to manage their health.
3. Improve care coordination, by exchanging meaningful clinical information among providers of the health care team and between providers and patients.
4. Improve population and public health through communication with public health agencies.
5. Ensure adequate privacy and security protections for protected health information
   - Ensure privacy and security protections for confidential information through operating policies, procedures and technologies, and compliance with applicable law.
   - Provide transparency of data sharing to patient.
6. Simplify administrative functions performed by staff, by eliminating duplicative and burdensome processes.
7. Engage patients in the care delivery process.

8.5. Next Steps

Note: The Health IT Council is responsible for the final definition of the performance measures.

1. Create Ad Hoc workgroup to advise the Health IT council and MeHI on the data to be included in a comprehensive performance measurement program.
2. Define core set of performance metrics.
3. Define mechanism to collect performance data.
4. Set interim milestones and targets.
5. Leverage tools to track and monitor progress of key activities and milestones, status of Health IT adoption and other metrics.

9. Path Forward

The Commonwealth of Massachusetts is a leader in health care reform and innovation. It has established a bold vision for a health care system enabled by health care technology, where patients can routinely expect to obtain care that is based on their own individual medical history, preferences and prior treatment, and by the best and most current scientific and clinical knowledge. Because information is available at every step of the care delivery process, and, with the patient's permission, information about that patient is securely shared with every provider who treats the patient, coordination, quality and outcomes of care will improve. As this happens, the general health of the population will improve, and costs, both administrative and clinical, will decline. In addition, the Commonwealth will be better able to identify and address public health needs, and track the results of their activities. Achieving this vision will require significant investments, participation and cooperation of all stakeholders.

The first steps in achieving the goals have been taken – through the hard work and investments in EHRs and HIEs already made by many individual providers and communities – but much work remains to be done. The Commonwealth of Massachusetts has developed this Plan to align all stakeholders' activities in a coordinated way, to drive the progress towards these goals and the state's overall Health IT vision.

9.1. Key Milestones

The changes required to achieve this Health IT-enabled future state are iterative and include many interdependencies. They will not occur simultaneously. Therefore, high level key milestones have been defined, by multiple stakeholders in the health and care of Massachusetts residents, to plan for funding, change management, and technology implications of EHR and Health IT adoption. Priorities and milestones with greater specificity will be defined and driven by existing state/federal regulation but managed in a coordinated manner, as operational plans are designed. The following table lists the high level key milestones.

9.1.1. Key Milestone Examples for Health IT Activities

Target Year	Key Milestone
2010	Develop Health IT Strategic plan Establish PMO Develop Governance structure with decision-making processes Convene Ad Hoc Workgroups Produce Program Communication Plan Initiate Vendor Management and contractual agreements Submit the HIE Operational Plan including Sustainability, Privacy and Security, etc. Develop Certification Program IOO Provider Funding Alternatives Oversee the REC Operational Plan Establish Medicaid Partnership Recruit 100% of the Priority Providers for REC Coordinate Workforce development activities
2011	Select HIE Vendor(s) Establish Patient Engagement Baseline Provide Certification Program statewide HIE Pilot Operational HIE (clinical) Ensure REC Priority Providers achieve stage 1 meaningful use Provide Initial Population Health Reporting (local) Begin certifying Medicaid providers

Target Year	Key Milestone
2012	Ensure Operational HIE completed with governance structure in place Provide Consumer Engagement survey Ensure the Integration of EHRs to operational HIE
2013	Ensure REC Priority Providers achieve stage 2 meaningful use Develop Expansive Population Health Reporting (local, state, national)
2014	Pilot Interstate HIE Interoperability Re-Certify IOOs Perform Privacy and Security Audit – report publicly and use to make corrections
2015	Meet Chapter 305 requirement of implementing EHR systems in all provider settings and integrating those systems through a robust HIE Interstate Complete HIE Interoperability REC Priority Providers achieve stage 3 meaningful use Provide Consumer Engagement Survey National Health Information Network (NHIN) pilot if available

Consumer-Facing Application milestones to be phased in over this time period include care summary; reminders; electronic access to lab results; shared decision-making tools; decision-support tools; prompts and key information for customized care; real-time electronic access to records with links to helpful information; secure messaging; personal health records; online scheduling; remote monitoring for chronic illness management; ability to upload and transmit information from home health monitors; incorporation of patient-generated data; tools to connect to community resources; and online patient coaching, all of which have the potential to enhance satisfaction and quality, and contain costs.

The Commonwealth looks forward to engaging in a collaborative process that includes input from stakeholders. MeHI and the Health IT Council will publish regular status updates on their progress against these tasks and the overall Health IT vision. To keep apprised of Health IT activities, stakeholders can check MeHI's website at: http://www.maehi.org.

The Commonwealth has established a bold vision of the future, and achieving this vision will not be without its challenges. However, the Commonwealth has invested significant time and resources in understanding and anticipating potential challenges and has developed a comprehensive plan that addresses and attempts to mitigate those challenges. In addition, it has created a flexible, multi-stakeholder, collaborative governance structure that will allow it to address and respond to the unanticipated challenges that will likely arise in the future. MeHI, in its coordination and oversight role, will work with all the key stakeholders to ensure that it has access to the various types of expertise that will be required to support the Commonwealth and MeHI, as they work toward making the Commonwealth's vision a reality.

One of the major challenges moving forward will be the adequacy of funding necessary to sustain the long-term vision of Health IT in the Commonwealth. Even with federal grant funds to the state and direct financial incentives to hospitals, community health centers and individual providers, a gap will still remain between our ability to meet the requirements of both state and federal mandates for Health IT and the financial resources to do so. Going forward, we will need to ensure that we have open and transparent processes in place for addressing these financial challenges.

Massachusetts's history of leadership and innovation in the health care and technology arenas are well documented. By achieving its Health IT vision, the Commonwealth will once more lead the nation in demonstrating the power of visionary thinking, technology innovation, scientific research and a commitment to improving the health and welfare of its citizens, to improve quality and safety, reduce costs and support the objective of providing health care to all.

10. Appendix A: Terms and Definitions

American Recovery and Reinvestment Act of 2009 (ARRA): a $787.2 billion stimulus measure, signed by President Obama on February 17, 2009, that provides aid to states and cities, funding for transportation and infrastructure projects, expansion of the Medicaid program to cover more unemployed workers, health IT funding, and personal and business tax breaks, among other provisions designed to "stimulate" the economy.

Centers for Medicare and Medicaid Services (CMS): a federal agency within the United States Department of Health and Human Services that administers the Medicare program and works in partnership with state governments to administer Medicaid, the State Children's Health Insurance Program (SCHIP), and health insurance portability standards.

Certification Commission for Health IT (CCHIT): a recognized certification body (RCB) for electronic health records and their networks. It is an independent, voluntary, private-sector initiative, established by the American Health Information Management Association (AHIMA), the Health care Information and Management Systems Society (HIMSS), and The National Alliance for Health Information Technology.

Clinical Relationship Manager (CRM): responsible for assisting Massachusetts eHealth Institute (MeHI) with developing relationships with providers and their practices in order to successfully implement Health Information Technology (Health IT) and meet the requirements of the Regional Extension Center (REC).

Community Health Centers (CHC): health centers spread across the United States that provides comprehensive primary care to 20 million Americans with limited financial resources. CHCs focus on meeting the basic health care needs of their respective communities, providing treatment regardless of an individual's income or insurance coverage.

Computerized Physician Order Entry (CPOE): a process of electronic entry of medical practitioner instructions for the treatment of patients under his or her care. These orders are communicated over a computer network to the medical staff or to the departments responsible for fulfilling the order.

Control Objectives for Information and related Technology (COBIT): a set of best practices for information technology management created by the Information Systems Audit and Control Association (ISACA), and the IT Governance Institute (ITGI) in 1996. COBIT provides a set of generally accepted measures, indicators, processes and best practices to assist in maximizing the benefits derived through the use of information technology and developing appropriate IT governance and control in a company.

Electronic Data Interchange: structured transmission of data between organizations by electronic means

Electronic Health Record (EHR): As defined in the ARRA, an Electronic Health Record (EHR) means an electronic record of health-related information on an individual that includes patient demographic and clinical health information, such as medical histories and problem lists; and has the capacity to provide clinical decision support; to support physician order entry; to capture and query information relevant to health care quality; and to exchange electronic health information with, and integrate such information from other sources.

Electronic Medical Record (EMR): An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards ant that can be created, managed, and consulted by authorized clinicians and staff across more than one health care organization.

Executive Office of Health and Human Services (EOHSS): is the Massachusetts state agency that offers assistance to the state's most needy and vulnerable citizens.

Federal Information Security Management Act of 2002 (FISMA): is a United States federal law enacted in 2002 as Title III of the E-Government Act of 2002. The act requires each federal agency to develop, document, and implement and agency-wide program to provide information security for the information and information systems that support the operations and assets of the agency, including those provide for or managed by another agency, contractor, or other source.

Federally Qualified Health Center (FQHC): safety**-**net providers such as community health centers, public housing centers, outpatient health programs funded by the Indian Health Service, and programs serving migrants and the homeless. FQHCs provide their services to all people regardless of ability to pay, and charge for services on a community board approved sliding-fee scale that is based on patients' family income and size. FQHCs are funded by the federal government under Section 330 of the Public Health Service Act.

Health Care Quality and Cost Council (HCQCC): is a public entity responsible for setting quality and cost targets for the Commonwealth of Massachusetts. Their mission is to develop and coordinate the implementation of health care quality improvement goals that are intended to lower or contain the growth in health care costs while improving the quality of care, including reductions in racial and ethnic health disparities.

Health Care Effectiveness Data and Information Set (HEDIS): is a widely used set of performance measures in the managed care industry, developed and maintained by the National Committee for Quality Assurance (NCQA). HEDIS was designed to allow consumers to compare health plan performance to other plans and to national or regional benchmarks.

Health Information Exchange (HIE): As defined by the Office of the National Coordinator and the National Alliance for Health Information Technology (NAHIT), Health Information Exchange refers to the electronic movement of health-related information among organizations according to nationally recognized standards.

Health Care Information and Management Systems Society (HIMSS): is a health care industry membership organization focused on the optimal use of health information technology and management systems.

Health Insurance Portability and Accountability Act (HIPAA): enacted by Congress in 1996. Title I of HIPAA protects health insurance coverage for workers and their families when they change or lose their jobs. Title II of HIPAA, known as the administrative simplification (AS) provisions, requires the establishment of national standards for electronic health care transactions and national identifiers for providers, health insurance plans, and employers. The AS provisions also address the security and privacy of health data. The standards are meant to improve the efficiency and effectiveness of the nation's health care system by encouraging the widespread use of electronic data interchange.

Health Information Security and Privacy Collaboration (HISPC): was partnership consisting of a multi-disciplinary team of experts and the National Governor's Association (NGA). The HISPC worked with approximately 40 states or territorial governments to assess and develop plans to address variations in organization-level business policies and state laws that affect privacy and security practices which may pose challenges to interoperable health information exchange. RTI International, a private, nonprofit corporation, oversaw HISPC and was selected as the HHS contract recipient.

Health Information Technology (Health IT): As defined in the ARRA, Health Information Technology means hardware, software, integrated technologies or related licenses, intellectual property, upgrades, or packaged solutions sold as services that are designed for or support the use by health care entities or patients for the electronic creation, maintenance, access, or exchange of health information.

Health Information for Economic and Clinical Health (HITECH) Act: collectively refers to the health information technology provisions included at Title XIII of Division A and Title IV of Division B of the ARRA.

Health Information Technology Standards Panel (HITSP): A multi-stakeholder coordinating body designed to provide the process within which stakeholders identify, select, and harmonize standards for communicating and encouraging broad deployment and exchange of health care information throughout the health care spectrum. The Panel's processes are business process and use-case driven, with decision making based on the needs of all NHIN stakeholders. The Panel's activities are led by the American National Standards Institute (ANSI), a not-for-profit organization that has been coordinating the U.S. voluntary standardization system since 1918.

Health Information Trust Alliance (HITRUST): established the Common Security Framework (CSF), a certifiable framework that can be used by any and all organizations that create, access, store or exchange personal health and financial information.

Identity Access Management (IAM): involves people, processes, and products to identify and manage the data used in an information system to authenticate users and grant or deny access rights to data and system resources. The goal of IAM is to provide appropriate access to enterprise resources.

Institute of Medicine (IOM): an independent, nonprofit organization that works outside of government to provide unbiased and authoritative advice to decision makers and the public.

Implementation Optimization Organizations (IOOs): is a group of organizations such as vendors, consultants, or other private organizations that are responsible for deploying EHRs and the statewide HIE.

Individually Identifiable Health information: information that is a subset of health information, including demographic information collected from an individual

Interagency Service Agreement (ISA): an agreement involving or representing two or more agencies, especially government agencies.

International Organization for Standardization (ISO): is an international-standard-setting body composed of representatives from various national standards organizations. The organization disseminates worldwide proprietary industrial and commercial standards.

Massachusetts eHealth Collaborative (MAeH): formed in 2004 as an initiative of the physician community to bring together the state's major health care stakeholders for the purpose of establishing an EHR system that would enhance the quality, efficiency and safety of care in Massachusetts.

Massachusetts Health Data Consortium (MHDC): non-profit coalition of a wide range of public and private stakeholders that seek to address health information needs and improve health care in the Commonwealth. MHDC was tasked to collect, analyze and disseminate health care information.

Massachusetts Health Quality Partners (MHQP): provides reliable information to help physicians improve the quality of care they provide their patients and helps consumers take an active role in making informed decisions about their health care.

Massachusetts eHealth Institute (MeHI): is a division of the Massachusetts Technology Collaborative, a quasi-public organization that has been designated as the single statewide entity responsible for the coordination and the dissemination on a statewide basis of electronic health records (EHR) in all provider settings networked through an interoperable health information exchange (HIE).

Massachusetts Technology Collaborative (MTC): is a public economic development agency established by the Massachusetts Legislature in 1982 to foster a more favorable environment for growth in the state's innovation-based economy. The agency is currently advancing economic development in health care technology, information technology, life sciences, marine sciences, nanotechnology, broadband deployment, and clean energy.

Medicaid Information Technology Architecture (MITA): is an IT initiative intended to stimulate an integrated business and IT transformation affecting the Medicaid enterprise in all States. The MITA initiative's intention is to improve Medicaid program administration by establishing national guidelines for technologies and processes.

National Institute of Standards and Technology (NIST): the non-regulatory federal agency within the United States Department of Commerce whose mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology. NIST oversees the NIST Laboratories, the Baldrige National Quality Program, the Hollings Manufacturing Extension Partnership, and the Technology Innovation Program.

New England Healthcare EDI Network (NEHEN): collaborative of providers and payers in eastern Massachusetts that created, manages and operates a shared insurance EDI infrastructure.

Office of the National Coordinator (ONC): serves as principal advisor to the Secretary of HHS on the development, application, and use of health information technology; coordinates HHS's health information technology policies and programs internally and with other relevant executive branch agencies; develops, maintains, and directs the implementation of HHS' strategic plan to guide the nationwide implementation of interoperable health information technology in both the public and private health care sectors, to the extent permitted by law; and provides comments and advice at the request of OMB regarding specific Federal health information technology programs. ONC was established within the Office of the Secretary of HHS in 2004 by Executive Order 13335.

Patient Centered Medical Home: Patient care is delivered by teams of primary care providers, including physicians, nurses and other ancillary providers.

Patient Portal: healthcare-related online applications that allow patients to interact and communicate with their healthcare providers

Patient Health Record (PHR): systematic documentation of a patient's medical history and care, particularly for patient use.

Payment Card Industry Data Security Standard (PCI DSS): was created by American Express, Discover Financial Services, JCB, MasterCard Worldwide, and Visa International. It represents a set of fundamental security requirements, industry tools, and measurements that address the handling of sensitive cardholder information.

Protected Health Information (PHI): any information relating to an individual's medical records, health plan beneficiary information, physical or mental health information, or provided health services or any information collected during health service.

Personally Identifying Information (PII): is information that can be used to uniquely identify, contact, or locate a single person or can be used with other sources to uniquely identify a single individual.

Regional Extension Center (REC): as set out in the ARRA, Regional Extension Centers will be created by ONC to provide technical assistance and disseminate best practices and other information learned from the Health Information Technology Research Center to aid health care providers with the adoption of health information technology.

Primary Care Provider (PCP): a physician, such as a general practioner or internist, chosen by an individual to serve as his or her health-care professional and capable of handling a variety of health-related problems, of keeping a medical history and medical records on the individual, and of referring the person to specialists as needed.