



MiHIN

Michigan Health Information Network

Conduit to Care: Michigan's e-Health Initiative

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The Michigan Health Information Exchange (MiHIN) *Conduit to Care* project is proud to present this report to Governor Jennifer M. Granholm. The MiHIN *Conduit to Care* project thanks the Governor for this opportunity to build a plan that will improve the quality, safety and efficiency of health care delivery by accelerating adoption and use of health information technology and health information exchange. To successfully accomplish this major advance in the state's health care system requires a collaborative approach, from all stakeholders involved, including consumers, providers, payers, employers, policy makers, and the public whose health is at stake. The *Conduit to Care* is the product of a "180 day" partnership of a diverse set of Michigan's health care and business stakeholders. The MiHIN *Conduit to Care* project has been greatly enhanced by the many different voices and disparate viewpoints of over 200 Michigan stakeholders. The time, energy and expertise that each individual and organization contributed to this project should not be underestimated.

As the leaders of this project, we would like to extend our sincere thanks to everyone who contributed to this immense effort. Special thanks are warranted to the sponsors of the MiHIN *Conduit to Care* project – Michigan State University, Central Michigan University, Michigan State Medical Society, and the Michigan Health and Hospital Association. Further, we are grateful for the assistance and guidance from the Michigan Public Health Institute and the eHealth Initiative. Their knowledge, assistance, dedication, and teamwork were essential to the successful completion of this report.

This report is a starting point as there are significant tasks ahead of us to make our vision a reality. To delineate these tasks better the report has been structured as a consolidation of findings from all groups, not a listing of reports by each workgroup. Michigan has the potential to make significant progress in the widespread adoption of health information technology and the implementation of health information exchange. This report offers recommendations for Michigan to realize the benefits of health care information technology and health care information exchange.



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I. EXECUTIVE SUMMARY

In the Institute of Medicine's 2006 report, "Patient Safety: Achieving a New Standard for Care," a primary recommendation called for "all health care organizations to provide immediate access to complete patient information and decision support tools." The increasing number of calls locally and nationally to implement health information technology and health information exchange have, at their heart, the goal of putting current and comprehensive patient information in the hands of practitioners at the point of care.

Today, in Michigan, the goal of providing consolidated clinical information to health care practitioners is, as yet, unachieved. Despite progress in the adoption of health information technology *within* health care organizations, there are no operational health information exchanges providing consolidated clinical records between health care organizations. While Michigan shares many barriers and challenges with other states, it also has unique strengths and opportunities that can be leveraged to ensure success.

The transformation to the electronic exchange of health information across traditional organizational boundaries is inevitable and is driven by many compelling needs, however there are many challenges. First, the U.S. health care system is highly fragmented. Health care data is stored, often in paper form, in "silos", (e.g., hospitals, laboratories, physician offices, ambulatory treatment centers, and pharmacies). Second, public health agencies utilize phone, fax and mail to conduct public health surveillance, detection, management and emergency response. Third, physicians spend 20 – 30 percent of their time searching for information and very often do not find the health care information they need at the time when they need it the most, when with the patient.

In addition, health care professionals and clinical service providers need the capability to exchange health information in order to improve patient care by ensuring that accurate patient data (medications, allergies, chronic conditions, history, etc.) are available at the point of care. Health information exchange (HIE) is a way to electronically move personal health and medical information securely between various health care organizations and providers under current medical privacy and confidentiality standard procedures. The goal of HIE is to facilitate delivery and retrieval of clinical data to provide safe, timely, efficient, effective, and equitable patient-centered care.

Michigan Governor, Jennifer M. Granholm, has charged the Michigan Department of Community Health (MDCH) and the Michigan Department of Information Technology (MDIT) with bringing together Michigan's health care and business stakeholders to develop a vision and plan for the future of health information technology and exchange in Michigan. In Governor Granholm's 2006 State of the State Address, the goal of extending health information technology to every health care setting was highlighted:

"We will help our health care industry stop depending on your memory and their paper records as databanks. We are going to use technology to vastly improve the system. In the future, you will be able to give your pharmacist, your doctor, or the emergency room immediate access to your information, but you will control who sees it and what it is used for."

To support this goal, the Michigan legislature passed legislation (P.A.137-2006) to create Michigan's first Health Information Technology Commission and appropriated \$9.5 million to fund regional health information exchange projects in FY 2007. Moving forward with the Governor's charge, the Michigan Health Information Network (MiHIN) *Conduit to Care* project was created to convene Michigan's key stakeholders to define the roles the state can and should play to improve the quality and affordability of health care by advancing the adoption of health information technology and promoting regional HIE. In this report, the statewide plan is referred to as the "*Conduit to Care*."

Conduit to Care Methodology

To accomplish the *Conduit to Care*, a statewide Steering Committee and six workgroups – clinical, financial, governance, legal, regional and technical were established to address specific issues, foster statewide involvement and provide recommendations. Overall, 200 health care leaders and experts representing major health care organizations, public health agencies and public and mental health providers, government, providers, health care consumers and payers, information technology, academia, and others contributed their time and expertise to developing this report. Project management and oversight of all the workgroups was provided by a team comprised of Michigan Department of Community Health, Michigan Department of Information Technology, Michigan Public Health Institute, Health Network Services Group and eHealth Initiative. The project team and workgroup leaders met in early April 2006. The workgroups were initiated in May 2006 and conducted research over 180 days with each workgroup meeting for over sixteen hours formally in addition to countless hours of work completed independently or in small groups outside the formal meetings.

Health Information Technology and Health Information Exchange

The *Conduit to Care* makes a distinction between health information technology (HIT) and health information exchange (HIE). The definitions below state how these two components compliment each other.

HIT is the use of computer software and hardware to process health care information electronically within a health care organization, thereby enabling the storage, retrieval and use of data, information and knowledge for communication and decision making related to patient care delivery. Examples of organizations where HIT is applied include physician offices, commercial laboratories, hospitals and integrated delivery systems. Electronic medical record (EMR) systems, administrative systems (e.g., registration) and clinical information systems (e.g., clinical documentation and computerized physician order entry) are examples of HIT systems.

HIE, within the context of this report, is a technological infrastructure and a set of agreed upon business processes to enable movement of health care information electronically among and between organizations for patient care, with primary emphasis in a region or community and ultimately, across the State of Michigan and the nation. HIE provides the capability to electronically move clinical information between disparate health care information systems (e.g., hospitals, laboratories, physician offices, ambulatory treatment centers, and pharmacies) while maintaining the integrity and meaning of the information being exchanged. The goal of HIE is to facilitate delivery, access and retrieval of clinical data to provide safe, timely, efficient, effective, equitable, patient-centered care. HIE services are built once

and used multiple times by many throughout the evolution of an HIE. The focal point for the organization and delivery of the services is a regional HIE. A central website, provider index, standardized health care terminology translation tools, Master Patient Index (MPI), authentication and authorization infrastructure, data sharing agreements and applications to aggregate information from multiple sources are examples of HIE resources.

Although this report emphasizes the promotion and development of regionally governed and operated HIEs, there are a few crucial parallel efforts that need to be successfully coordinated and implemented in order to support the continuous evolution of the patient record and ultimately, the transformation into safety, quality and efficiency goals. The HIE increases information availability for health professionals and patients, and creates an infrastructure to support other health technologies. Nevertheless, two “last-mile” end-user applications, electronic medical records and electronic prescribing (e-prescribing), are critical to transform improved data availability into improved health outcomes. These two applications play an essential role in making available crucial patient-specific clinical data needed in Phase B and Phase C of the HIE evolution. Therefore, it is essential that the HIE and HIT-related (EMR and e-prescribing) incentives be planned and supported together. The *Conduit to Care* focuses on HIE because it requires community-wide implementation and support, while most HIT is typically implemented and supported by individual organizations. Additionally, HIE emphasizes changes in business processes and behaviors related to the sharing of information. HIT focuses on tools that are necessary, but not sufficient, by themselves to achieve the goals described. Care must be taken, however, to assure that HIE and HIT are compatible and interoperable and that incentives are aligned for the adoption of such technologies.

MiHIN *Conduit to Care* Guiding Principles

To aid in the *Conduit to Care* development process, specific guiding principles were endorsed and provided the foundation for a long-term strategy:

Guiding Principle 1: Consumer privacy, security and confidentiality are paramount.

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

Guiding Principle 2: Clinical data will only be utilized for the clinical care process.

Health care information disclosed for one purpose may not be used for another purpose without informed consent, unless otherwise permitted by law. Patients understand their personal health data is being used for diagnosis, treatment, and operational activities as defined in the Health Insurance Portability and Accountability Act (HIPAA) regulations. This specific Guiding Principle will facilitate the early adoption of HIE and build trust. Clinical data must only be utilized for clinical care processes during the formative stages of HIE development in MI. As HIE in the State of Michigan evolves, this decision and Guiding Principle may be revisited.

Guiding Principle 3: The delivery of health care is local; therefore, health information initiatives at the regional level are critical.

By adopting this view of the health care system it is a natural extension that data be shared amongst a naturally occurring and commerce-defined community of providers. Patients seek services on a regionalized basis therefore the model of greatest economical efficiency is one where a patient's data is available throughout the region to participating entities.

Guiding Principle 4: Multi-stakeholder collaboration is needed to implement achievable and measurable initiatives in order to show early progress and value.

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

Why a Regional Focus?

The trend of statewide efforts to create an interconnected, electronic health care system has been driven by needed improvements in health care quality and effectiveness and the need to reduce the cost of health care. Today, state leaders are recognizing that HIT and HIE can address many health care challenges. However, the development of HIE has been, for the most part, driven by local and grassroots efforts since health care services and patient health care experiences are primarily local or regional.

Physicians, clinical service providers and patients live with the realities of highly fragmented, inaccessible and expensive patient-specific clinical information delivery and retrieval every day. Since the early application of information systems in health care (some 40 years ago), where the hospital was the primary repository for most clinical information, much has changed. Now the vast majority of clinical information and patient encounter data reside outside the hospital in fragmented silos based on where health care delivery occurs, such as the physician office.

Patients tend to seek care locally, or at most, regionally. Therefore, a regional focus is needed. Solving the problems inherent in the transition to interoperable interconnected electronic health information requires the development of ever increasing trust and further collaboration in order to move through the stages of the electronic medical record and HIE evolution. Thus, the focus of the *Conduit to Care* was the development of a plan to encourage, facilitate, incent and organize regional health information exchanges to:

- Free clinical data from their silos, transform it and deliver it securely, rapidly and reliably to the patient's caregiver;
- Aggregate and organize clinical data to inform physicians and other caregivers about the patient's complete history and treatment, thereby enhancing quality and patient safety; and
- Empower patients to manage their health care data through personal health records for quality improvement and care management.

Conduit to Care Recommendations

The Steering Committee and workgroups determined various recommendations that have regional and statewide impact. The *Conduit to Care* discusses these recommendations in the following two sections:

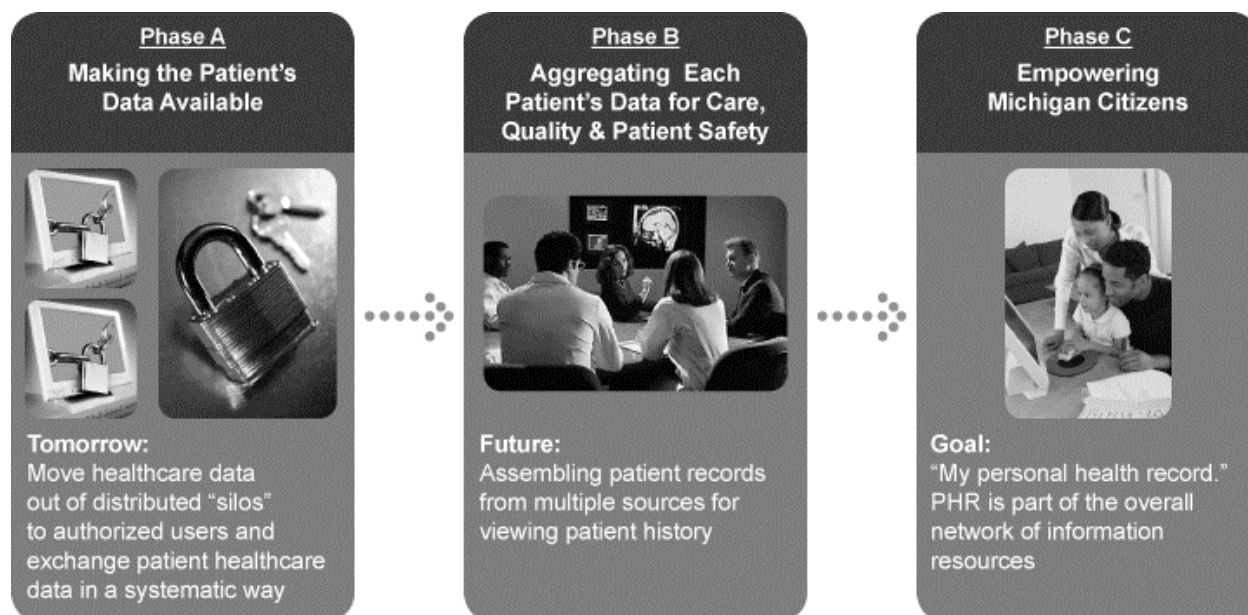
1. Evolution of the patient health record
2. Role of the State of Michigan government

Evolution of the Patient Health Record

Advancement of the electronic patient health record is an incremental process that begins by making data available in a systematic way to reduce “silos” and evolve toward the aggregation of data specifically for patient quality and safety. The logical steps to accomplish this include assembling patient records from multiple sources for viewing more complete patient histories, and eventually empowering Michigan citizens through the creation of a portable Personal Health Record (PHR). This approach will take into special consideration the rural and underserved areas which will not necessarily have as many resources to acquire, support, or maintain health information technologies to enable participation in HIE efforts.

An essential characteristic of the recommendations from the MiHIN *Conduit to Care* project is the focus on the patient, their clinical data and its electronic transformation into ever improving completeness, communication, organization and presentation to serve the needs of the patient, their physician(s) and others involved in their care and health. The three phases (A, B and C) outlined below provide a schematic focal point of the *Conduit to Care* demonstrating the developmental building blocks/evolutionary phases comprising the foundation and development of Michigan’s health information exchange initiatives.

Diagram A: Evolution of the Electronic Patient Health Record



The phases present a logical sequence based on the current organization and availability of patient information as well as economic feasibility; however, this does not preclude regional HIEs from starting at any point within these phases. All three phases are described below.

Phase A: Making Patient Data Available

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

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

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

Phase C: Empowering Michigan Citizens

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

Privacy and Security

In any phase, one of the greatest potential barriers to the electronic sharing of clinical information is the difficulty in establishing privacy and security credibility with the public and participating stakeholders. Because of the sensitive nature of patient-related data, and the potentially devastating consequences of an inappropriate disclosure, security and privacy concerns must be met in order to achieve success. While there are detailed privacy and security recommendations from the workgroups, this report focuses on:

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

As HIE implementation grows across Michigan, the State of Michigan government will have a specific role in health information exchange. That role will continue to be defined as each of the initiatives delineates the specific process and products of their HIE, and more detailed legal issues need to be addressed. Additionally Michigan recently received federal funding to complete the Health Information Security and Privacy Collaboration (HISPC) work. The HISPC project’s main task is to identify barriers and solutions to security and privacy of health information exchange. These findings will be beneficial in supporting HIE efforts in Michigan as the recommendations are implemented.

Parallel to the HISPC work, the MiHIN initiative included a Legal Workgroup. This report summarizes the Legal Workgroup's initial discussions, which will require integration into the outcomes of the HISPC to ensure that laws are accurately and consistently interpreted throughout the process of planning and implementation. A variety of federal and state statutes and regulations affect the formation of any Health Information Exchange in Michigan. Implementation of the *Conduit to Care* requires that consistent and meticulous legal interpretation of laws that are applicable to HIT and HIE be performed to ensure long-term success. These can include federal and state laws on electronic medical record confidentiality and privacy, security, consumer rights, electronic medication prescribing, fraud, abuse, and antitrust. The resolution of many of the legal challenges will depend greatly on how a Health Information Exchange is structured, the types of health care information being exchanged, the types of participants in the exchange, and the purposes for which the exchange is accessed by the participants.

Role of State of Michigan Government

Over the last year there has been a significant increase in the amount of activity at the national, state and regional levels to create a more interconnected, electronic health care system. Increasingly, decisions regarding the scope and the direction of HIT and HIE initiatives will be made at the regional level where healthcare is delivered. However, state-level coordination is required and should be focused on those functions that add clear value when performed at the state level. Recommended functions that can be implemented at the state level to support the MiHIN vision and Michigan's regional HIE initiatives include the following:

Legal Interpretation and Consensus

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

Standard Setting and Technical Support

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

Statewide Coordination

- Establish the MiHIN Resource Center
- Leverage MiHIN Resource Center workgroup structure for HIE & HIT advisory needs
- Provide resources to Michigan's HIT Commission
- Encourage regional HIEs to move toward the exchange and interoperability of clinical data
- Conduct statewide medical trading area analysis

Fundraising and Administration of Statewide Funding

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

Education and Marketing

- Encourage collaboration and communication amongst stakeholders regarding *Conduit to Care*

The state, along with foundational regional efforts, can play an important role in transforming the way that health care is delivered to patients in Michigan. It is important to note that the *Conduit to Care* provides a blueprint and a set of recommended strategies to foster HIE. For the goals outlined to be achieved, however, leadership at all levels is required in order to continue this dialogue and facilitate the activities needed in Michigan to create an interconnected health care system.

Conclusion

There is an expansion of Michigan HIT and HIE initiatives currently in operation or in the planning stages. Now is the time to act to ensure these initiatives are coordinated across the state and do not develop into “islands of information.” This report has been designed to capture and provide an overall view of health information exchange in Michigan, focused primarily on the development of healthcare information exchange to create the basis for statewide connectivity. The *Conduit to Care* delivers a strategy for future development of HIEs and incorporates the discussions, recommendations and admonitions of the workgroups and participants. Additionally, this report initiates an incremental approach for building a strong foundation upon which leadership in the State of Michigan can transform health care.

In order to maintain the momentum established over the past several months and to transition the *Conduit to Care*, there are immediate activities to be performed. First and foremost is the establishment of the statewide coordinating structure (MiHIN Resource Center) and the need to orient the HIT Commission to the recommendations and the details provided in the *Conduit to Care*. Other immediate actions that can be performed by the MiHIN Resource Center include:

- Development of a marketing and education plan for the *Conduit to Care*
- Creation of a consumer brochure providing information about the *Conduit to Care* and HIE
- Continuation of the development of the Reference Guide and tools for regional HIEs
- Development of a Request for Proposal process for regional HIE funding

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

II. INTRODUCTION

Background

In early 2005, the State of Michigan government, through the leadership of Governor Jennifer M. Granholm and the Departments of Community Health (MDCH) and Information Technology (MDIT), placed a priority on using information technology to drive quality improvements and efficiency in the health care system. Leadership in State of Michigan government recognized that planning for advancing the use of health information technology in Michigan's health care system would involve the challenge of leveraging existing health IT investments throughout the state, as well as aligning HIEs with national initiatives.

In the spring of 2005, the Directors of MDCH, Janet Olszewski, and MDIT, Teri Takai, met with Dr. David Brailer, former Chief of the Office of the National Coordinator for Health Information Technology within the U.S. Department of Health and Human Services, to discuss a statewide Michigan Health Information Network (MiHIN) and to learn more about national health information technology activity.

In the summer of 2005, MDIT and MDCH convened seven stakeholder forums, facilitated by Public Sector Consultants, Lansing, Michigan, to hear the perspectives of key health care stakeholders on the role of state government in health information technology policy. Participants in the forums were representatives from automobile manufacturers, state agencies, unions, health systems, insurers/health plans, physicians, pharmacists, nurses, researchers and health care consumers. Throughout each of these seven forums two common threads emerged. First, all groups felt strongly that any innovation in the health care system must be driven by quality improvements and should be patient-centered as opposed to driven by efficiency or cost reduction. Second, each group found that the State of Michigan government was in the best position to convene stakeholders to facilitate and coordinate activity. It was recommended that MDCH and MDIT bring stakeholders together to develop a common vision and plan for advancing health information technology in Michigan.

From the stakeholder forum outcomes, in December 2005 Michigan held a MiHIN kick-off conference, sponsored by CyberMichigan. Over 300 stakeholders from across the state attended this event. The MiHIN kickoff began with presentations from local, regional and national experts on health information activities and initiatives that were currently underway or being planned. At this kick-off, volunteers were self-assigned to MiHIN workgroups. Following that event, on January 24, 2006, Governor Granholm announced the long-term direction of health information exchange and health information technology in Michigan during her 2006 State of the State Address.

On April 3, 2006, the MiHIN officially began the *Conduit to Care* 180-day project. This was created to convene Michigan's health care stakeholders to speed the adoption of health information technology and promote health information exchange in to improve access to clinical data to provide safe, efficient, effective, and equitable patient-centered care. As an output from the stakeholder forums held in the summer of 2005, the *Conduit to Care* approach was to utilize information technology with a clear focus on improving the delivery of high quality, safe health care.

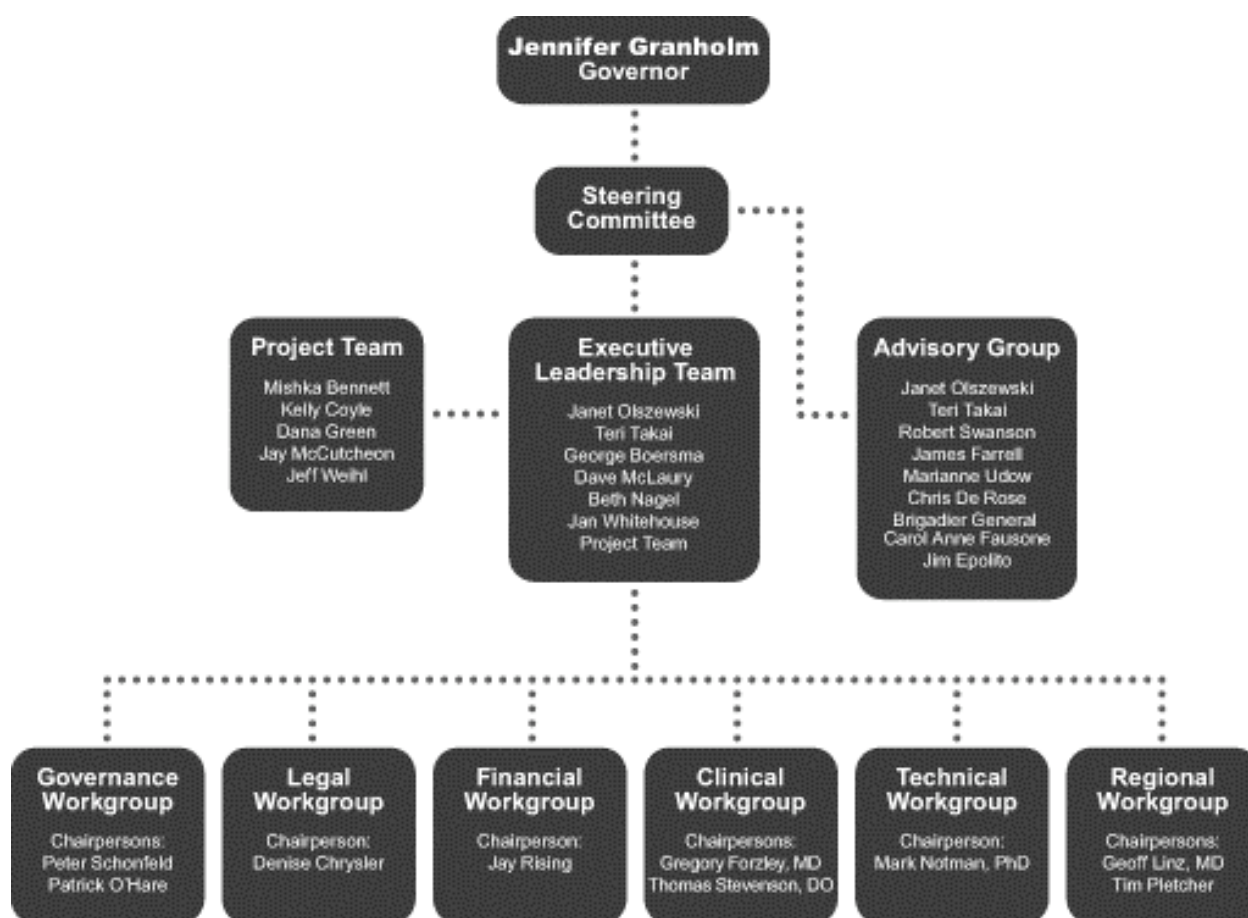
While the *Conduit to Care* Steering Committee and Workgroups met at least once a month, multiple other meetings with staff and leadership also aided in facilitating progress. Michigan continued to demonstrate leadership in May 2006, when Governor Granholm signed legislation introduced by Representative Gary Newell and passed by the Michigan legislature that created a Health Information Technology Commission within MDCH. This 13 member HIT Committee will use the MiHIN *Conduit to Care* to advise the State of Michigan in its ongoing efforts to promote and support the exchange of health information technology. The HIT Commission was appointed on August 7, 2006 and met for the first time in October, 2006.

Finally, in May 2006, Michigan was awarded a contract from the Research Triangle Institute and the National Governor's Association Center for Best Practices. Under this contract, Michigan will participate in the Health Information Security and Privacy Collaboration (HISPC), which will implement a process addressing organization-level business policies and state laws that affect privacy and security practices and may pose challenges to interoperable health information exchange. This contract will end in April, 2007 and will assist efforts in the privacy and security work of MiHIN.

Project Structure

As Diagram B illustrates, the MiHIN *Conduit to Care* operated through a Steering Committee and six workgroups to efficiently produce a plan exploring methods that mobilize information in support of patient care and focusing on the creation of an interconnected, electronic health system. An Executive Leadership Team, Workgroup Leadership Team, Advisory Group and a Project Management team supported this process. A listing of all *Conduit to Care* participants is available in Appendix A.

Diagram B: MiHIN *Conduit to Care* Organization Chart



The Steering Committee was charged with comprehensively reviewing issues surrounding the creation of an e-health infrastructure in Michigan and to develop guidance for the users of such infrastructure. There were 22 members seated on the Steering Committee including two Co-Chairs – Janet Olszewski, Director of the Michigan Department of Community Health and Teri Takai, Director of the Michigan Department of Information Technology. The Steering Committee included membership from a diverse and comprehensive representation of Michigan health care stakeholders. See Appendix A for the listing of organizations and stakeholder groups represented on the Steering Committee.

Workgroups were created to assist the Steering Committee and to provide specific recommendations for Steering Committee consideration. The six Workgroups established were clinical, financial, governance, legal, regional, and technical. All Workgroups were formed on a voluntary basis and all meetings were open to the public. This open and inclusive makeup of Workgroup membership provided a channel for all interested individuals and organizations to be represented and heard. There were approximately 200 people who volunteered their time to participate in the *Conduit to Care* workgroups. See Appendix A for the listing of Workgroup Chairpersons and volunteers.

Each Workgroup was led by at least one Chairperson, who also participated in the Steering Committee meetings. Also, nationally-based subject matter experts were assigned to some of the Workgroups through the assistance of the eHealth Initiative (www.ehealthinitiative.org). Health Network Services (HNS) also contributed to the overall coordination of the project. Further, several Workgroups were assigned staff members to assist with activities through sponsorship agreements with the following associations: Michigan State Medical Society (Clinical Workgroup), Michigan Hospital Association (Governance Workgroup), Michigan State University (Technical Workgroup) and Central Michigan University (Regional Workgroup). See Appendix B for a detailed description of each Workgroup. From April to September 2006, key activities were achieved to develop the MiHIN *Conduit to Care*:

- Workgroups made recommendations.
- Steering Committee reviewed recommendations.
- Executive Leadership and Project Management Teams synthesized recommendations into a cohesive document.
- Draft report was presented to the Steering Committee and Advisory Group for review and approval.
- Once approved, the final report will be received by the Governor.
- Upon the Governor's approval, the plan will be implemented in a phased approach.

The sections in this report are structured around concepts and recommendations, not around the specific recommendations from each of the Workgroups. This structure helps to present the cohesive and interrelated nature of the process and output of the Workgroups. Many of the recommendations discussed in the following pages were echoed in more than one Workgroup.

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

Health Information Technology and Health Information Exchange

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

Health information exchange (HIE) is an infrastructure to enable movement of health care information electronically across organizations within a region or community. It must also have agreed-upon business relationships and processes to facilitate information sharing across organizational boundaries. HIE provides the capability to electronically move clinical information between disparate health care information systems while maintaining the meaning of the information being exchanged. The goal of HIE is to facilitate access to and retrieval of clinical data to provide safe, timely, efficient, effective, equitable, patient-centered care. HIE services facilitate a one to many connection between clinical service providers and clinicians/patients instead of the many to many connection existing today. A central website, health care terminology translation tools, a Master Patient Index (MPI), authentication and authorization infrastructure, and applications to aggregate information from multiple sources are examples of HIE resources.

The Difference Between HIE and HIT

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

1. Electronic Medical Records (EMRs)
2. Electronic Prescribing (e-Prescribing)

Electronic Medical Records

Electronic medical records (EMRs) are an important part of the overall vision of the *Conduit to Care*. An EMR is an electronic record containing information about a patient with the ability to communicate with other applications within a health enterprise (hospital, clinic, physician practice). EMRs are very important to health care as they can provide cost savings as well as improve the efficiency and safety of health care. Health care technology can provide alerts and reminders to the clinician warning of possible injury or missed opportunities for prevention. They can also enable continuous 24/7 access to records as

well as simultaneous access to a single record by multiple users. Additionally, they can reduce the cost of record management over time, when compared to paper records.

An EMR is only as useful as the clinical information it contains, and the task of getting information *into* an EMR is still daunting. Information is constantly arriving at the physician's office from the many different clinical service providers involved with a patient's care (laboratories, pharmacies, imaging centers, mental health centers, therapists and, of course, the patient and his or her caregivers). Information about medications, tests and procedures performed by other providers is also needed for clinical decision-making. In today's marketplace, the lack of standardization causes hand-transcription, scanning paper-based documents into the EMR and other practices that do not facilitate a holistic view of the patient or enable automated alerts and reminders. Another solution is to create different interfaces for each EMR, in order to import data from every provider, which rapidly becomes cost-prohibitive. Thus, electronic health information exchange actually becomes a *prerequisite* for the cost-effective implementation and full benefit of EMRs in many, if not most, physician practice settings. It is therefore impractical to wait to initiate clinical information exchange pending the widespread installation of EMRs.

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

Electronic Prescribing (e-Prescribing)

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

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

Current State – Michigan HIT and HIE Activity

Michigan shares many barriers and challenges with other states, but it also has unique strengths and experiences that can be built upon to help ensure success. The state continues to provide vision, leadership and direction on health IT - telemedicine, vital records, immunization registry, disease surveillance, Medicaid management, pharmaceutical pricing and others. Specifically, the Michigan Care Improvement Registry (formerly the Michigan Childhood Immunization Registry) (MCIR) is an award winning, state-of-the-art electronic statewide immunization tracking system for all Michigan citizens who receive, or are offered, immunizations anywhere in Michigan. Other unique factors about Michigan follow below and are further detailed in Appendix C.

- Vision, Leadership, Landmark Policy and Program Alignment
- Critical Mass of Stakeholders
- National Caliber IT Capabilities and Foundation of Experience
- Historic Economic Pressures and Restructuring Serve as Challenges and Drivers
- Geographic, Service Scope and Diversity Call for Regional Solutions

Specific to HIT, according to a report commissioned by Blue Cross Blue Shield of Michigan and the Partnership for Michigan's Health (comprised of the Michigan Health & Hospital Association, the Michigan State Medical Society, and the Michigan Osteopathic Association), many of Michigan's health care providers have had widespread success in implementing electronic medical systems, but less than one-third of the state's acute care hospitals have comprehensive systems¹. According to the report, Michigan is also outpacing most states in adopting computerized forms of physician order entry. The report also pinpointed barriers to adopting a statewide system, which include inconsistent coding systems between providers, a lack of promotion, and computer systems that vary between hospitals. For an inventory of the many HIT projects underway in Michigan, see Appendix D.

Michigan's Eight HIE Initiatives

To further demonstrate Michigan's uniqueness, MiHIN's Regional Workgroup interviewed eight self-identified Health Information Exchange initiatives in various stages across Michigan. These eight HIE initiatives are:

- Capital Area RHIO
- Greater Flint Health Coalition
- Holland Regional Effort
- Michigan Health Infrastructure – Grand Rapids area
- Michigan Health Information Alliance – Central Michigan area
- Michigan Upper Peninsula Health Information Technology Network
- Southeast Michigan Health Information Exchange
- Thumb Rural Health Network

¹ <http://www.detnews.com/apps/pbcs.dll/article?AID=/20060322/BIZ/603220390/1040>

There may be additional initiatives across the state that the Regional Workgroup did not interview. Interviews were conducted by a subset of Regional Workgroup members to gather information on the status of these initiatives as well as to discover what a statewide effort could do to assist them in their endeavors. Information gathered was considered by the Regional Workgroup and aided in making decisions regarding recommendations for the *Conduit to Care* report. Specifically, the interviews fostered understanding of the expectations that each self-identified regional initiative had for a statewide effort and how it could facilitate their efforts. The interview template and summaries of each interview are in Appendix E.

During the interviews, it became clear that there is not only interest around the state to develop such exchanges, but also that there is an understanding of a necessary statewide role. Besides funding support, the initiatives listed other specific support needed statewide:

- Provide standards/guidelines for exchange of information within and between regional HIE activities
- Provide a “starter guide” (e.g., reference guide/tool kit) for regional HIE initiatives
- Act as an umbrella to connect regional initiatives
- Identify and facilitate the availability of subject matter experts to assist with planning and helping regional efforts get started
- Provide recommendations on key legal issues relevant to data sharing
- Foster the promotion and adoption of standards
- Facilitate the development of a statewide master patient index

HIE Stages

Regional health information exchanges have been classified, in an annual survey, by eHealth Initiative into stages showing their progress in the HIE evolution. Listed below are the definitions used by eHealth Initiative for each stage. A majority of the initiatives in Michigan are in the first three stages of HIE development. It is anticipated that Michigan may have several HIEs in the later stages of development by the next survey.

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

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

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

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

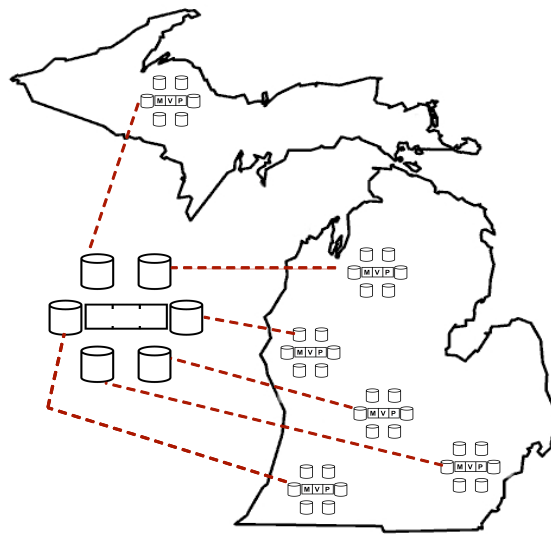
Stage 5: In this stage the regional HIE is fully operational. They are transmitting data that is being used by health care stakeholders. A sustainable business model has been established.

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

Future State – Michigan HIE

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

Diagram C: Future State – Regional and Statewide Approach



In order to facilitate HIE initiatives with the highest probability of sustainability and effectiveness, there are certain characteristics necessary to ensure that these regional HIEs are adequately prepared to participate in HIE within the State. The Regional Workgroup developed these characteristics and recommends they be used in the future when defining a regional HIE in Michigan.

- Goals include improving the quality, patient safety, access and cost-effective delivery of care as a result of using technology which facilitates the collective ability of the involved organizations to exchange, share and integrate health information.
- The regional HIE must be governed by a multi-stakeholder group representing organizations involved in the exchange of administrative and clinical information. The kinds of stakeholders would include but not be limited to: practicing clinicians, hospitals, laboratories, health plans, major employers, the State, public health, patient groups, purchasers, quality improvement organizations, hospital associations, and medical societies.

- Follow a common (or when completed, nationally-endorsed) set of principles and standards for the technology and policy aspects of health information exchange.
- Develops and implements a technical infrastructure based on national standards to facilitate interoperability.
- Develops and maintains a model for sustainability that aligns costs with benefits.
- Designs and implements metrics to measure performance from the perspectives of patient care, public health, provider value, and economic value.

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

To assist with envisioning the future of MiHIN, the Governance Workgroup drafted a vision statement and goals. These two items are important to focus on while implementing many of the recommendations listed.

MiHIN Vision

“The MiHIN will foster development of HIE that will reduce the overall cost of care while at the same time increasing the quality of care and patient safety.”

MiHIN Goals

1. Improve the quality and efficiency of health care delivery for Michigan citizens by accelerating the adoption and use of a collaborative model including health information technology (HIT) and health information exchange (HIE).
 - Minimize redundant data capture and storage, inappropriate care, incomplete information and administrative, billing and data collection costs.
2. Promote evidence-based medical care to improve patient safety and quality.
3. Encourage patient-centered care: Connect health care providers – clinicians and facilities to ensure continuity of care for every patient.
 - Increase patient understanding and involvement in their care.
 - Enhance communication between patients, health care organizations and clinicians.
4. Promote national standards to guide the sharing of information and electronic data interoperability.

5. Safeguard privacy and security of personal health information.
6. Leverage existing health information systems.
7. Create a business model that balances cost and risk.
 - Implementing organizations must see sufficient value to justify their investment.
 - Regional HIEs need to be self-sustaining.

The specific mission for the 180 day MiHIN *Conduit to Care* process was to articulate a path to develop a health information network connecting the State of Michigan, with an infrastructure and governance model for long-term sustainability through public-private partnerships.

Health Care Industry Laws and Regulations Impacting Health Information Organizations

All workgroup volunteers articulated and understood the importance of laws and regulations in the health care industry, especially in protecting patients' rights. Therefore, the *Conduit to Care* specifically reviewed those laws and regulations that impact health information organizations and the sharing of information. The laws discussed below are those which are likely to have the most extensive and pervasive impact on HIE, however, this list is not exhaustive. Appendix F includes a more extensive list of Michigan laws, with citations, that are relevant to HIE.

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

- A. **Privacy and Confidentiality Laws.** Federal, state and common law create minimum protections regarding the privacy and confidentiality of identifiable health and personal information in electronic, written, verbal, and any other form. These include the federal privacy regulations under the Health Insurance Portability and Accountability Act (HIPAA), federal Alcohol and Other Drug (AOD) confidentiality regulations, Michigan's Public Health and Mental Health Codes, and Michigan's Social Security Number Privacy Act. These laws, and Michigan's Medical Records Access Act, establish patients' rights regarding access to their health information. Patients' rights include the right to inspect and obtain copies of their own health information, to request restrictions on disclosure of health information, seek amendments for inaccuracies, and obtain an accounting of certain disclosures.
- B. **Security Laws.** Federal security regulations under HIPAA, although technology neutral, require implementation of appropriate security safeguards to protect certain electronic health care information that may be at risk while permitting appropriate access, availability and integrity and use of that information. Covered entities must conduct an assessment of the potential risks and vulnerabilities to the confidentiality, integrity, and availability of electronic protected health information held by the entity. Also, they must implement sufficient administrative, physical, and technical safeguards (considering their size, funding and ability) to protect information that the

covered entity creates, receives, maintains, or transmits. The regulations contain standards for each type of safeguard and implementation specifications for each standard. See Appendix G for a matrix of standards and implementation specifications for administrative, physical, and technical safeguards, which was included as an appendix to the federal security regulations.

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

C. Health Care Fraud and Abuse Laws. These laws are intended to prevent fraud and abuse by regulating the relationships between physicians and other health care entities.

1. **Physician Self-Referral (Stark Laws).** The federal Stark Law prohibits a physician from making referrals for certain “designated health services” (DHS) payable by Medicare to an entity with which the physician has a financial relationship, unless an exception applies. The law also prohibits the entity from submitting claims to Medicare or anyone else for Medicare DHS that are furnished as a result of a prohibited referral. The Stark Law is enforced by the Centers for Medicare and Medicaid Services (CMS). Violations of the statute are punishable by denial of payment for all DHS claims, refund of amounts collected for DHS claims, and civil monetary penalties for knowing violations of the prohibition.

Michigan law incorporates the federal Stark Law as it existed on June 3, 2002, prohibiting a physician from making referrals for certain “designated health services” regardless of source of payment. This means that federal exceptions to the Stark Law adopted after June 3, 2002, such as the recently adopted exception for certain electronic prescribing and electronic health records arrangements, described below, have not been incorporated in Michigan law.

2. **Anti-kickback Laws.** The federal anti-kickback statute provides criminal penalties for individuals or entities that knowingly and willfully offer, pay, solicit, or receive remuneration in order to induce or reward the referral of business reimbursable under any of the federal health care programs. Remuneration may be direct or indirect. Prohibited conduct includes not only the payment of remuneration intended to induce or reward referrals of patients, but also the payment of remuneration intended to induce or reward the purchasing, leasing, or ordering of, or arranging for or recommending the purchasing, leasing, or ordering of, any good, facility, service, or item reimbursable by any federal health care program. Violations of the anti-kickback statute may also result in the imposition of civil money penalties, exclusion from federal health programs, and liability under the False Claims Act.

The U.S. Department of Health and Human Services, Office of Inspector General (OIG) enforces the federal anti-kickback statute. Congress required that OIG adopt regulations

providing “safe harbors” to limit the reach of the statute somewhat by permitting certain non-abusive arrangements, while encouraging beneficial or innocuous arrangements. These “safe harbor” provisions specify various payment and business practices that would not be treated as criminal offenses under the anti-kickback statute, even though they may potentially be capable of inducing referrals of business under the federal health care programs.

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

CMS recently adopted an “exception” from Stark for certain electronic prescribing and electronic health records arrangements. Likewise, OIG adopted a “safe harbor” from the anti-trust statute for certain electronic prescribing and electronic health records arrangements. Both of these took effect October 10, 2006 and may be found at <http://www.oig.hhs.gov/fraud/safeharborregulations.html>. This exception (safe harbor) as well as other exceptions (safe harbors), need to be evaluated to choose the most advantageous structure, while minimizing risk for violations. Michigan law incorporates the federal Stark Law, and licensing action can be taken against a physician for violation; however, Michigan has not updated its provisions to remain consistent with the federal law. This mismatch between federal and state law needs to be corrected.

- D. **Antitrust.** Federal antitrust laws include the Sherman Antitrust Act, the Clayton Act and the Federal Trade Commission Act. These laws are intended to promote competition, prohibit collusion and regulate other business practices that unfairly reduce competition. Generally, clinical service providers are competitors in the marketplace. Thus, when competitors join together in a cooperative venture, such as an HIE, questions may arise regarding activities that unfairly control development or access to HIE technology or contractual terms that exclude certain providers from participating. Thus these laws must be considered in structuring an HIE and defining terms of participation.
- E. **Federal Tax Laws.** Parties that join together to form an HIE may include one or more tax-exempt entities. Tax-exempt organizations are prohibited from providing improper financial or other benefits to a private individual or entity. Since HIE contemplates the interchange of information between tax exempt entities and private or for-profit entities, these laws must be addressed in structuring an HIE and defining terms of participation.
- F. **Intellectual Property.** “Intellectual property” is a product of the intellect that has commercial value, such as trademarks, patents, copyrights, and trade secrets. Legal concerns will need to be addressed in developing an HIE including the ownership of the system that electronically transmits health information and its components. Software licensing and ownership issues will

need to be resolved regarding each element and process that make up the HIE (e.g., data formats, data layouts, interfaces, security measures, process to standardize data, creation of an aggregate health record, record locator system, etc.) Additionally, in connecting to the HIE, and building interoperability with their current systems, clinical service providers may encounter legal issues related to current software licensing agreements. These will also need to be resolved.

- G. **Laws Regulating Prescribing Practices.** Prescribing practices are highly regulated to ensure appropriate use and distribution of controlled and non-controlled substances.
- H. Controlled substances are regulated at the federal level by the Food and Drug Administration (FDA) and the Drug Enforcement Administration (DEA) and at the state level by the Public Health Code and the Michigan Board of Pharmacy Rules regarding controlled substances. DEA regulations require that prescriptions for controlled substances be hand-signed. The DEA is currently developing standards to permit electronic transmission of prescriptions for controlled substances (see Electronic Prescriptions for Controlled Substances, Anticipated Standard for DEA Electronic Transmission of Prescriptions for Controlled Substances System, available at http://www.deadiversion.usdoj.gov/ecomm/e_rx/e_standard.htm) and anticipates that any system that meets technological, security and audit standards described at the website listed above may be used to process electronic prescriptions. However, the standards are not yet final. According to the DEA this electronic system is in addition to and not a replacement of the existing paper-based prescription system.
- I. The Michigan Board of Pharmacy Rules regarding controlled substances already allow e-Prescribing at the option of the patient, provided there would be no conflict with federal law.
- J. Prescriptions for non-controlled medications are primarily controlled at the state level. There are e-prescribing systems operating in Michigan, although e-Prescribing is not specifically addressed under the Public Health Code or current Michigan Board of Pharmacy Rules. This is in the process of changing. In December 2005, the Board of Pharmacy filed draft rules that specifically address electronic prescribing of non-controlled substances, establishing standards for e-Prescribing systems to protect the public. More recently, HB 6323 was introduced into the legislature on August 9, 2006 and would amend the Public Health Code regarding e-Prescribing for non-controlled and controlled substances to the extent allowed by federal law. Both HB 6323 and the Board of Pharmacy's proposed rules require that the patient "opt-in", providing that prescriptions may be transmitted electronically only at the request (option) of the patient from the prescriber to the pharmacy of the patient's choice.

IV. MIHIN CONDUIT TO CARE GUIDING PRINCIPLES

The context of the recommendations within the *Conduit to Care* are based on the following core principles, which the MiHIN *Conduit to Care* participants widely viewed as the building blocks for a statewide health information exchange.

Guiding Principle 1: Consumer privacy, security and confidentiality are paramount

The *Conduit to Care* acknowledges that safeguarding consumer privacy, security and confidentiality, within the limits imposed by law, is a critical key to success in advancing the use of health information technologies and exchanges. From the beginning of Governor Jennifer Granholm's charge for Michigan's health care to move into the 21st century by utilizing health information technology, it is clear that consumer needs and interests are of the utmost importance.

"In the future, you will be able to give your pharmacist, your doctor, or the emergency room immediate access to your information, but you will control who sees it and what it is used for."

– Governor Jennifer M. Granholm, 2006 State of the State Address.

It has been Michigan's mission from the beginning that consumers must be in control of their health information and as this state moves to support sustainable HIE efforts, legal compliance and patient health information protections must be a central focus. The *Conduit to Care* is based on the premise that with any improvement to Michigan's health care system, privacy and security of health information must be maintained in compliance with local, state and federal statutes.

Michigan's health care stakeholders agree with this mission and during stakeholder forums commissioned by the State of Michigan in the summer of 2005, a patient-centered and collaborative approach to health information technology was a common vision shared throughout a diverse set of stakeholders. This group of employers, unions, insurers, providers and consumers agreed that quality benefits and maintaining appropriate access to personal health data were essential to facilitating health IT initiatives. Further, Michigan's health care stakeholders support the need for patient privacy in the use of personal health data.²

Throughout each phase of MiHIN's efforts to help build health information exchanges, the standard of consumer privacy, security and confidentiality will be paramount within the limits imposed by law. The *Conduit to Care* promotes the development of technology, policy and legal solutions that allow for the greatest patient control, access and ownership to personal health information as well as effective security and privacy assurances.

² Health Information Technology in Michigan: Stakeholder Forums, October 2005

Guiding Principle 2: Clinical data will only be initially utilized for the clinical care process.

Health care information disclosed for one purpose may not be used for another purpose without informed consent, unless otherwise permitted by law. Patients must know their personal data is being used for diagnosis, treatment, and operational activities as defined in HIPAA regulations, unless they have given explicit permission for their information to be shared for other purposes (e.g., disease surveillance, research, etc.).

In order to gain commitment and understanding from key stakeholders involved in HIEs around the State of Michigan, the *Conduit to Care* team realized that other specified uses of a person's clinical data would be needed. Therefore, the consensus of the Workgroups was that in the beginning of HIE across the State of Michigan, clinical data will only be utilized for clinical purposes. Potential future uses will follow naturally, based on stakeholder interest, agreement and support.

Guiding Principle 3: The delivery of health care is local; therefore, health information initiatives at the regional level are critical.

By adopting this view of the health care system, it is a natural extension that data be shared amongst a naturally occurring and commerce-defined community of providers. Patients are seen as seeking service on a regionalized basis, therefore the model of greatest economical efficiency is one where a patient's data is available throughout the region to participating entities.

Guiding Principle 4: Multi-stakeholder collaboration is needed to implement achievable and measurable initiatives in order to show early progress and value.

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

V. CONDUIT TO CARE RECOMMENDATIONS

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

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

Evolution of the Electronic Patient Health Record

An essential characteristic of the recommendations found in the *Conduit to Care* is the focus on patients. Specifically, their clinical data and its electronic transformation into ever-improving completeness at the point of care, clarity, communication, organization and presentation to serve not only the needs of the patient, but their physician(s) and others involved in their care and health. The three phases (A, B and C) outlined below, provide the schematic focal point of the *Conduit to Care* report demonstrating the phases and direction for the foundation and development of Michigan's health information exchange initiatives.

Diagram A: Evolution of the Electronic Patient Health Record



Phase A: Making the Patient's Data Available

Move health care data out of non-connected distributed “silos” (e.g., labs, pharmacies, payers, hospitals, etc.) to authorized users and exchange patient health care data in a systematic way.

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

Assembling patient records from multiple sources for viewing patients' histories using standardized data.

Phase C: Empowering Michigan Citizens

Patients have the choice to maintain and manage their health information through a private, secure and confidential environment – “my personal health maintenance record”.

The following descriptive materials have been organized into three phases (A-B-C) and one or two stages of development for each of the phases. Each phase, and the stages within, correspond to a logical sequence of HIE activities and services expected in new regional initiatives in order to address the goals and principles outlined in this report. The phases and the stages are not intended to be prescriptive, but are recommendations of sequence based on the analysis of a few of the strongest community-wide HIEs in the U.S. and on the priorities reflected in the *Conduit to Care* workgroup activities. Therefore, the outline for each of the phases is as follows:

- Phase
 - Stage 1 – Current State and Today's Scenario
 - Stage 1 – Future State and Tomorrow's Scenario
 - Stage 2 – Current State (where applicable)
 - Stage 2 – Future State (where applicable)
- Impact (Benefits and Beneficiaries)
- Challenges (Legal, Technical and Financial)



Phase A: Making the Patient's Data Available

There are two stages within Phase A. The first stage streamlines the current process of results delivery. The second stage provides electronic interfaces of the patient's data directly into the physician's EMR.

Stage 1 – Streamlining the Current Process

Current State

In today's health care system, clinical results and reports are delivered to the requesting physician from each of the clinical service providers to which a physician refers their diagnostic and therapeutic work using a wide variety of methods – faxing, courier, telephone, direct line printers, and mail. Each clinical service provider (e.g., hospitals, laboratories, imaging centers and specialty testing centers) has their own results delivery processes(s) specific to the recipient of the information. Errors and inefficiencies can be introduced in the current results delivery process: the

wrong result is sent to the provider, no result is sent, the result is delayed, results are not sent to 'copy to' physician, and the transmission is interrupted and resulting in duplicate or partial reports.

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

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

Today's Scenario

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

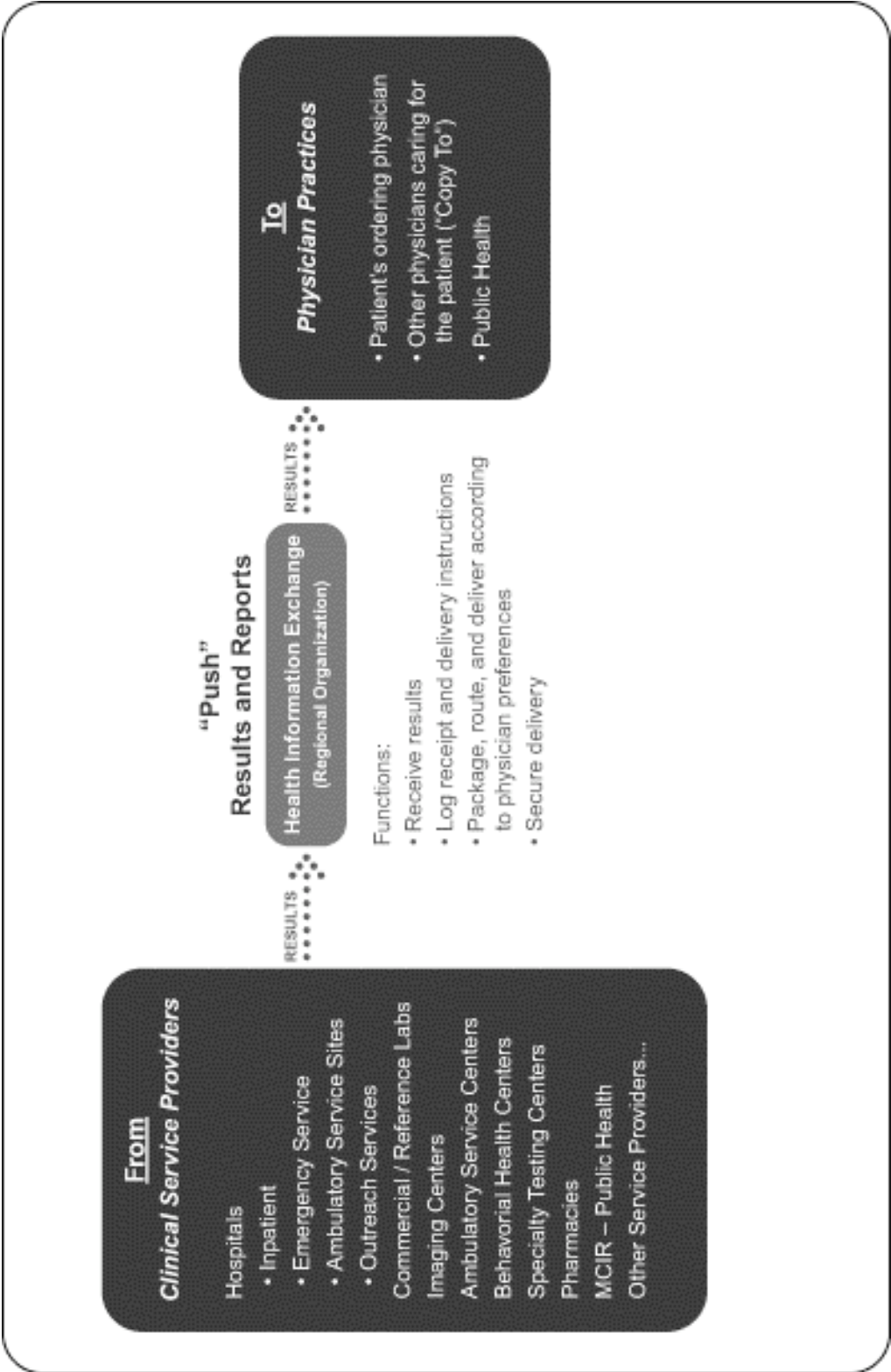
The current state example described above is not the "best practice" for patient care. The recommended changes to streamline the current process are described below in Stage 1 – Future State.

Future State

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

These services will streamline the results delivery process, thereby reducing the current costs and reducing future enhancements required to provide high levels of customer service. When the HIE is fully operational the information exchange will reduce the number of varying delivery processes, reduce the number of "call back" and "error correction" processes for physician offices and reduce the heavy emphasis on the need for tracking as delivery error rates decrease. It should also provide management reports for clinical service providers on the volume of delivery services, callbacks, costs and quality improvements. The HIE working with their customers and the physician practices, will also be able to reduce costs, improve the call-back environment, provide tracking and management reporting, and address timeliness and reliability issues with direction and support from their customers.

Diagram D: Phase A - Stage 1 - Making the Patient's Data Available



Note: Clinical Service Providers will achieve a range of benefits that vary greatly across the region, from minimal to dramatic improvements. This range is due to differences in current results delivery processes and the extent to which regions incorporate HIE-related processes.

Tomorrow's Scenario

The patient, Mary, arrives at the orthopedic surgeon's office for her scheduled pre-op appointment for knee replacement surgery. The surgeon, Dr. Smith, is made aware that Mary is waiting in the exam room. Mary had pre-operative diagnostics performed a few days ago and is waiting for Dr. Smith's review. Since the x-rays and the laboratory results have already been incorporated in to Dr. Smith's workflow, they are available for Mary's office visit and he is able to complete her office visit in a timely and efficient manner.

Stage 2: Building Upon Phase A Stage 1 – Making the Patient's Data Available (to physician practice electronic medical records)

Current State

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

The national focus on, and promotion of, EMRs to physicians (with reimbursement increases, incentives and other encouragement) have generated significant interest and increase in purchase of such systems. The national averages of EMR market penetration are reported at less than 20 percent. As more practices purchase and implement EMRs, they will learn that EMRs do not contain all of a patient's data immediately. No results from outside their practice like lab, radiology, medication history, hospital results or reports; or results from referrals to other physicians are available until they are manually entered into the system.

Today's Scenario

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

All of this equates to the physician practices having to wait for interfaces, use multiple portals, scan paper results into their EMRs, essentially not simplifying or streamlining processes. It is envisioned that national

standards and the Certification Commission for Health Care Information Technology (CCHIT)³ will require physician practice EMRs to have these interoperable electronic results delivery software components. The current state example described above is not the “best practice” for patient care. The recommended changes to streamline and simplify the use of HIT with HIE are described below in Stage 2 – Future State.

Future State

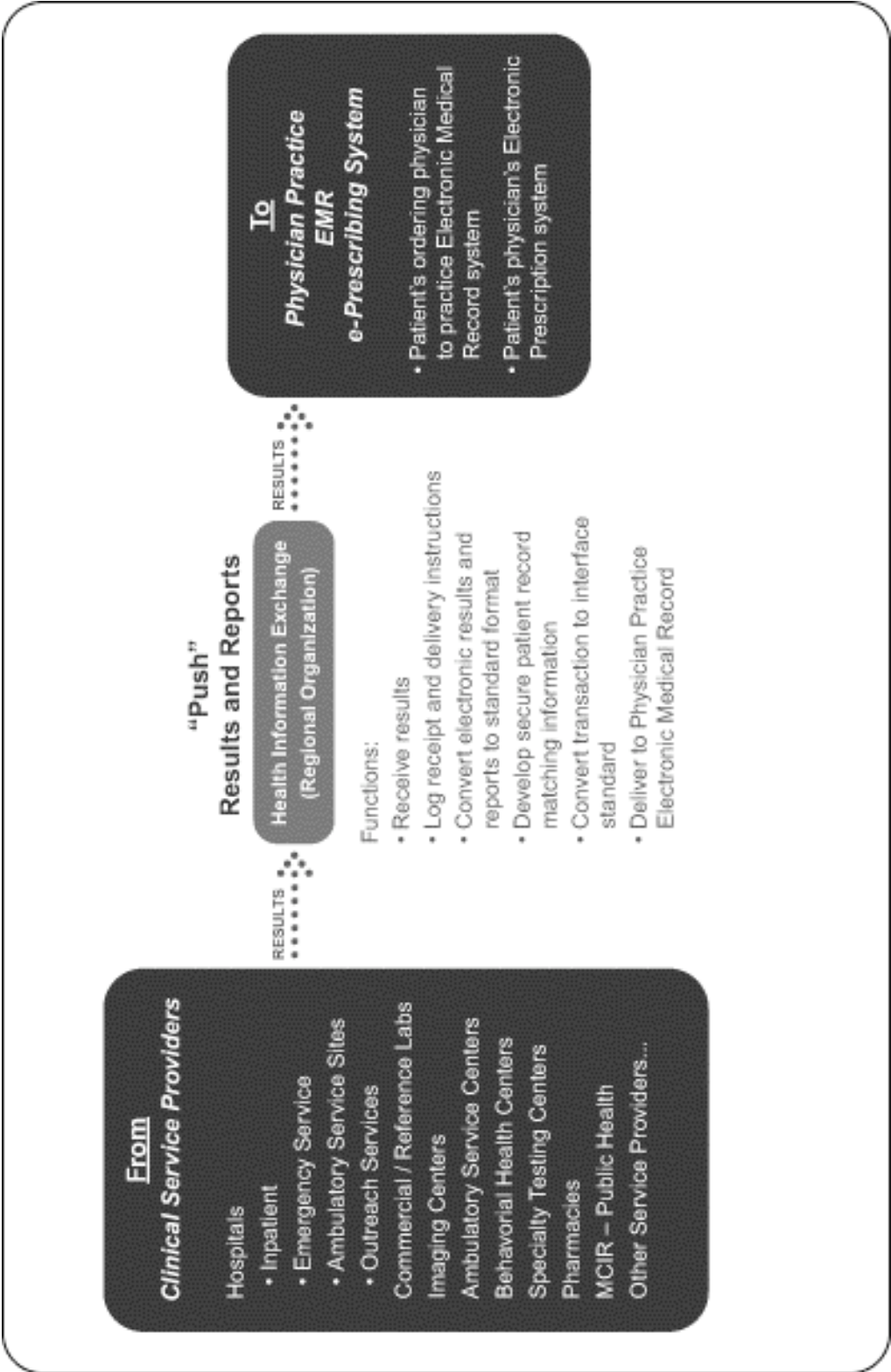
The regional HIE will provide results and report interfaces to physician practice EMRs from clinical service provider results being delivered to the HIE in Stage 1. These interfaces could be provided to any physician practice from all clinical service providers wishing to have these interfaces developed and implemented.

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

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

³ Certification Commission for Healthcare Information Technology (CCHIT) is the recognized certification authority for electronic health records and their networks, and an independent, voluntary, private-sector initiative. <http://www.cchit.org>.

Diagram E: Phase A - Stage 2 - Making Patient's Data Available (to physician practice electronic medical records)



Impact of Phase A

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

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

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

Challenges of Phase A

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

Legal Challenges/Issues

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

- In forming an HIE, numerous legal issues arise such as corporate form, system governance, who participates, terms of participation, criteria for violation, sanctions, indemnification, obligations upon receipt of public funds, etc. The options and potential legal implications will need to be examined.
- Parties that join together to form an HIE may include one or more tax-exempt entities. Tax-exempt organizations are limited in their ability to provide financial or other benefits to a private individual or entity. These laws must be addressed in structuring a regional HIE and deciding terms of participation.
- The physician self-referral (Stark) and Anti-Kickback statutes must be considered in structuring an HIE, to ensure that health systems and physicians can work together in developing an effective HIE without being in conflict.

Legal issues related to transfer of data:

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

Technical Challenges/Issues

For more details regarding overall technical issues and resources see Appendix H: Technology Overview

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

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

Phase A - Stage 1

Revenue

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

Savings

- Other established HIEs have reported the costs of the result delivery process, prior to the HIE being active, to be between \$.75 and \$1.25 per report. The HIE charges (now that they are active) were reported by Indiana Health Information Exchange (IHIE) in Indianapolis at between

\$.17 and \$.35 per report. These fees are most frequently paid by the clinical service providers whose results are being delivered by the new, more efficient service of the HIE.

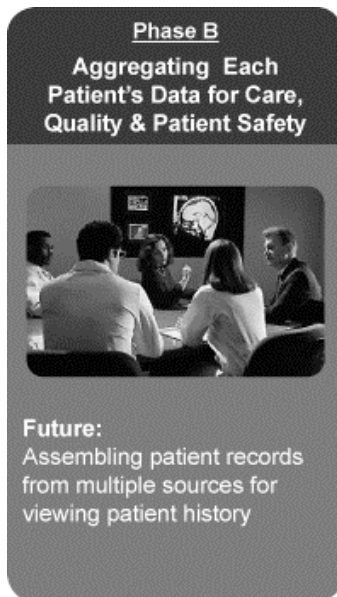
- A complete review of current results delivery processes and the costs of results delivery at each clinical service provider will provide the foundation to determine the size and scope of the benefits that would be available. This will only be determined on an HIE-by-HIE basis. One should not overlook the costs/benefits of the reduction or elimination of the 'call back' process both at the physician offices and in the various departments within the clinical service provider. Additionally, the increase in customer service to the ordering physician and to the patient should not be overlooked, either. Measurements should be identified and reports developed as part of the justification and ongoing confirmation of benefits.

Costs

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

Phase A - Stage 2

- Most of the financial challenges described in Phase A – Stage 1 apply here as well.
- The interfaces from the clinical service providers to physician practice EMRs and to physician practice e-Prescribing systems provide opportunities for reducing costs and enhancing physician practice HIT adoption and interoperability with physician practices. The charges for this service should be incurred by those who benefit. The principle discussions on this topic revolve around a shared cost by the clinical service providers and the physician practices, however, this revenue structure has yet to be implemented in a functioning HIE.
- The payment for these services could be shared across all clinical service providers and the physicians requesting them or through a number of other options. We expect substantial savings (up to 60 percent over current point-to-point options) from this shared interface development service provided by the regional HIE.



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

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

The creation of an aggregated patient summary was considered the number one priority of all workgroup volunteers and addresses many of the critical issues highlighted by the Clinical Workgroup. While there are many benefits from having a comprehensive view of the patient's past care there are also complex issues in the debate about who will pay for these services.

Stage 1 – Aggregating Results Information from Phase A

Current State

Today a patient's medical history may be dispersed out across several different information systems and organizations. A comprehensive view of a patient's past care requires the time-consuming request and review of multiple paper charts, and is highly prone to both missing information and transcription error. This is especially crucial in emergency care where the lack of timely access to aggregated and standardized patient care data can lead to decreased health care quality and patient safety. An example of the current state is described below.

Today's Scenario

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

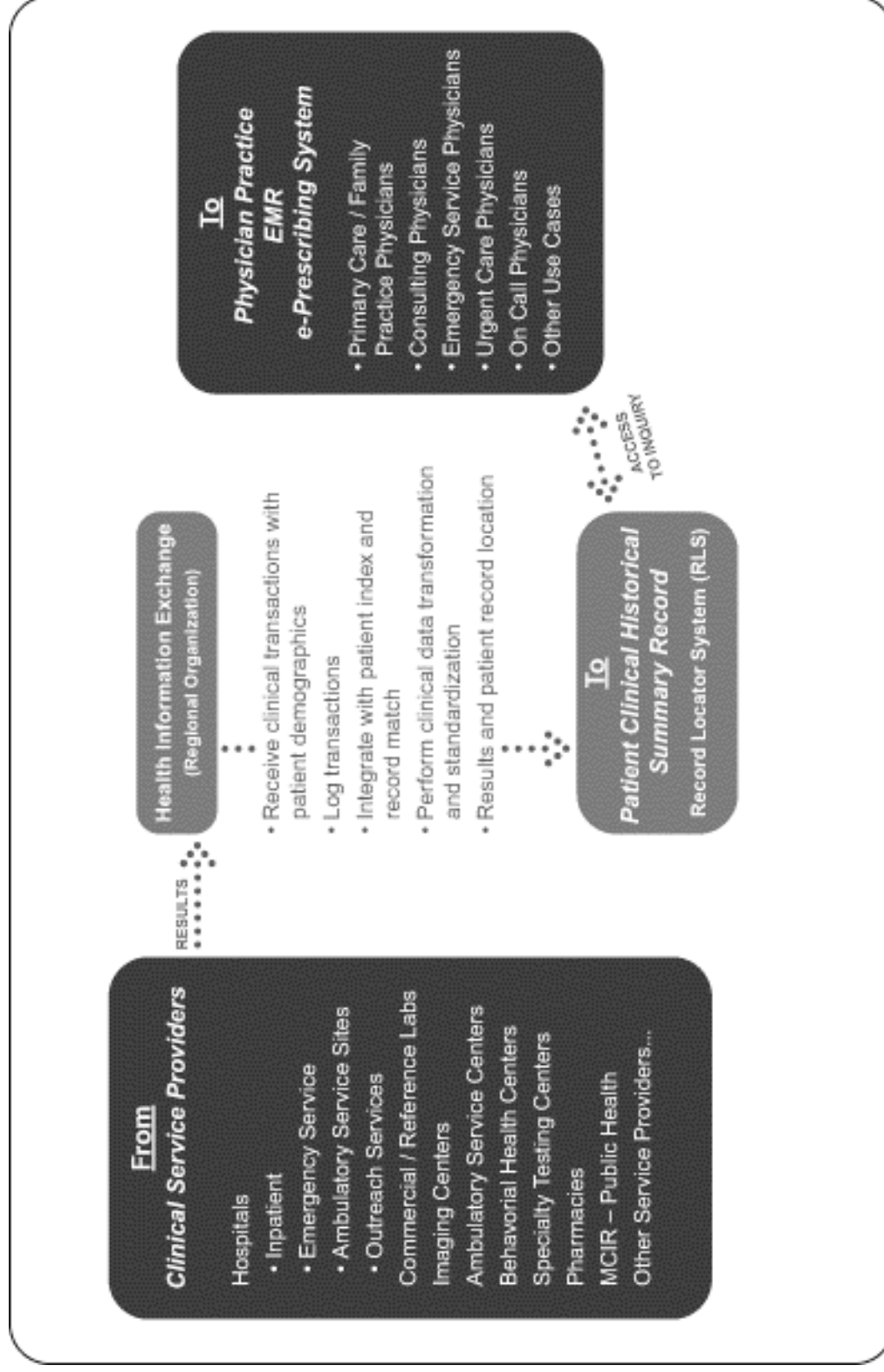
Without having the patient's history available the emergency room physician needs to get her started on an antibiotic in anticipation of admission. Jane is given a commonly used intravenous antibiotic that she, unfortunately, is allergic to. This causes a moderate allergic reaction that prolongs her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

The current state example described above is not the “best practice” for patient care. The recommended changes to streamline the current process are described below in Stage 1 – Future State.

Future State

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

Diagram F: Phase B - Stage 1 - Aggregating Clinical Service Provider Data for Quality and Patient Safety



Note: One or more Clinical Service Providers in a region may already have databases and provide inquiry services within their organization. However, the high priority issues from the Clinical Workgroup delineated the need for inquiry access to patient history across all Clinical Service Providers, not just one. Today, in order to get all the information necessary, multiple sign-ons are needed. Ultimately, what is needed is a comprehensive view with only one sign-on.

Tomorrow's Scenario

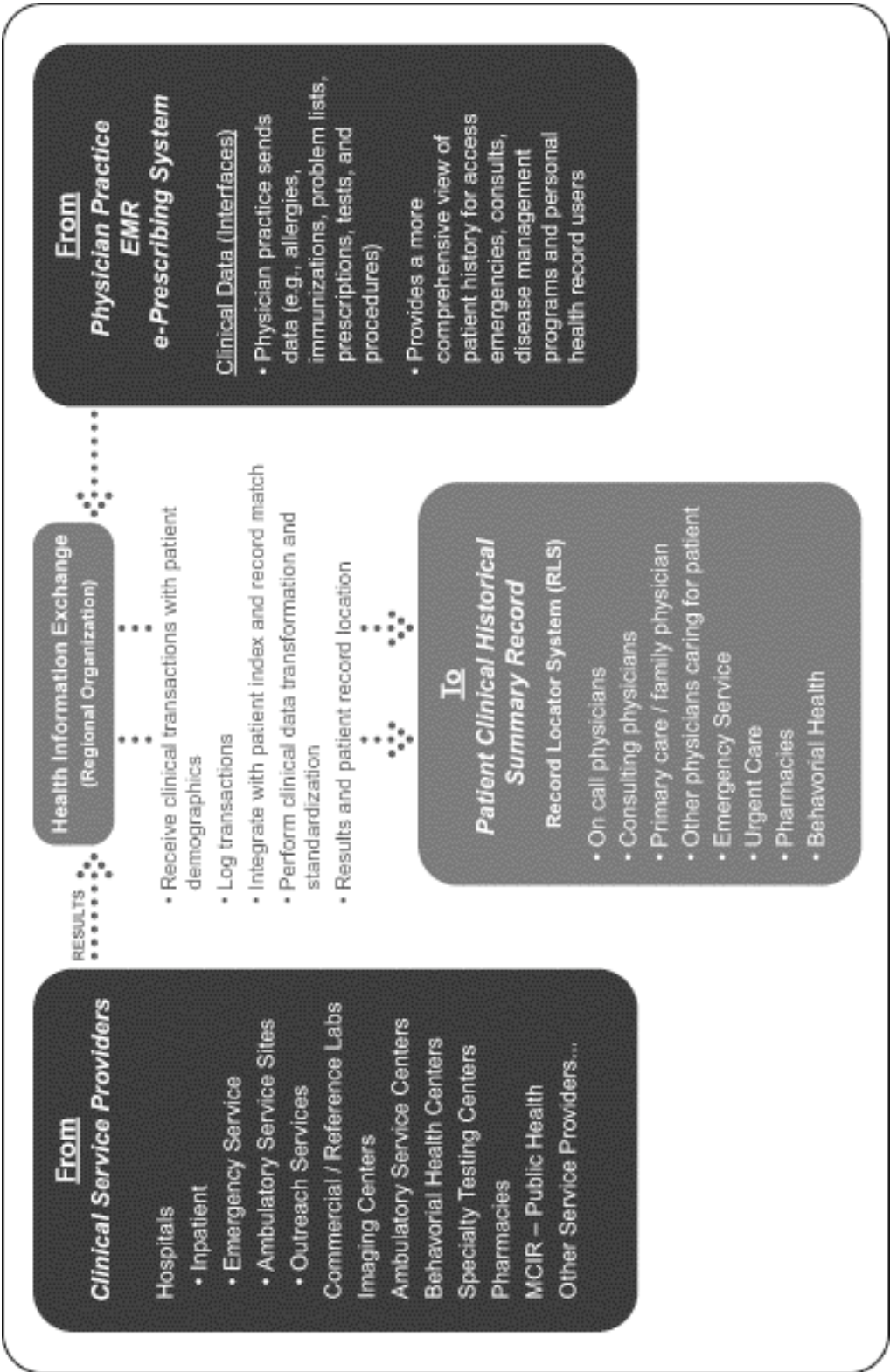
Jane arrives at the Emergency Department (ED) with her niece. She is lethargic and confused and the niece can offer only limited information. The patient is a widow, living alone at home, who overall is functioning well until she calls the niece and sounds somewhat confused and out of breath. When the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

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

Stage 2: Building Upon Phase B – Stage 1 - Aggregating Clinical Service Provider and Physician Practice Data for Quality and Patient Safety

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

Diagram G: Phase B - Stage 2 - Aggregating Clinical Service Provider and Physician Practice Data for Quality and Patient Safety



Impact of Phase B: Aggregating Data

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

Beneficiaries	Benefits
Clinical Service Providers (e.g., hospitals, laboratories, image centers and specialty testing centers)	<ul style="list-style-type: none">• Reduces unnecessary admissions or costly ED workups on patients with known histories and frequent ED visits• Reduces inappropriate care, unnecessary testing and avoidable risks when a patient's prior history is available to urgent care centers, emergency service departments and other triage sites• Improves care and reduces risk to patients who are in the care or in disease management programs or chronic care coordination programs if the patient history across the community is available to them• Provides a comprehensive record of patient history including medication history that would help hospitals with the medication reconciliation process• Improves reliability, and timeliness, and provides a uniform high quality automated delivery of secure and comprehensive views• Provides a vehicle for the delivery of clinical data and medication history from national labs, Pharmacy Benefit Managers, pharmacy chains, and referral centers
Physicians	<ul style="list-style-type: none">• Provides the ability to view a comprehensive record of medications, laboratory results, allergies, procedures and other information related to a specific patient• Decreases time looking for data and information• Provides timely results retrieval and notification to the clinician• Reduces adverse drug-drug or drug-allergy interactions• Reduces redundant lab tests and procedures• Enhances communications between multiple providers who may be caring for a single patient• Improves ability to analyze patient-centered data to identify and re-engineer care processes• Assists patients in conserving resources from not having to repeat tests, spending extra time with referrals and following-up
Patients and Families	<ul style="list-style-type: none">• Improves patient safety• Improves controls on privacy and confidentiality• Provides to the care provider the patient's medical history, so the patient does not have to repeat it several times to different care providers• Reduces repeat testing, time delays, discomfort and additional coinsurance and deductible charges• Increases confidence in the provider environment due to their access to the patient history• Provides opportunities for the system to communicate special protocols and disease management programs• Allows the capability of providing the patient a copy of the work performed on this encounter and the previous history

Beneficiaries	Benefits
Public Health	<ul style="list-style-type: none"> Provides benefits similar to physicians (increased delivery time of results, reduction in errors, etc.) Allows for electronic communicable disease reporting (e.g., lead toxicity, HIV, sexually transmitted diseases) Facilitates data population for disease surveillance, clinical registries, and chronic disease management
Health plans, Insurers, Employers, Government Health plans	<ul style="list-style-type: none"> Reduces the claims from duplicate/repeat testing and treatment Provides opportunities to enhance patient safety and thus reduce errors and additional cost due to availability of patient history Reduces unnecessary risks of errors due to availability of history, allergies, and medication history Reduces ED visits and hospitalizations

Challenges of Phase B

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

Legal Challenges/Issues

Legal issues related to the formation organization of a HIE:

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

Legal issues related to transfer of data:

- This phase has both the potential to increase exposure to liability and to reduce exposure to liability.
 - Potential liability could increase for both HIE and participating health care providers regarding transfer of data because Phase B involves transformation/standardization of data and data availability to multiple providers.
 - The HIE could experience potential exposure to liability for errors that impact the patient, e.g., failure to timely transfer data, errors in standardization. The HIE could also experience potential exposure to action brought by a sending or receiving health care provider, or by a patient who is harmed under third party beneficiary theory.

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

disclosure of certain records related to treatment for drug and alcohol addiction. It may be challenging to establish an effective way of identifying sensitive records and creating access rules that permit compliance with these requirements.

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

Technical Challenges/Issues

The technology needed will expand from Phase A. For more details regarding overall technical issues and resources see Appendix H: Technology Overview.

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

Financial Challenges/Issues

Revenue

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

Savings

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

Phase C
Empowering
Michigan Citizens



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

Phase C: Empowering Michigan Citizens

After the implementation of the previous two views, Michigan will have the prerequisite infrastructure to export patient data to a personal health record (PHR) on an ongoing basis as the patient is engaged in health service activity such as ER visits, filling medications, obtaining laboratory tests, x-rays or other health care services. PHR is an HIT-related software application which individuals can use to maintain and manage their health information in a private, secure and confidential environment. The PHR may be offered by an insurer, employer, or authorized care provider of the patient's choice. The individual consumer is the primary user of the PHR and authorizes access to their personal health information via the PHR. That consumer may allow access to all or part of the PHR to anyone - a doctor, family member, employer, summer camp, or insurance company. Other potential PHR users are "stakeholders" who, when the primary user of the PHR gives his or her permission, can make valuable use of the information being kept in the personal health record.⁴

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

Today's Scenario

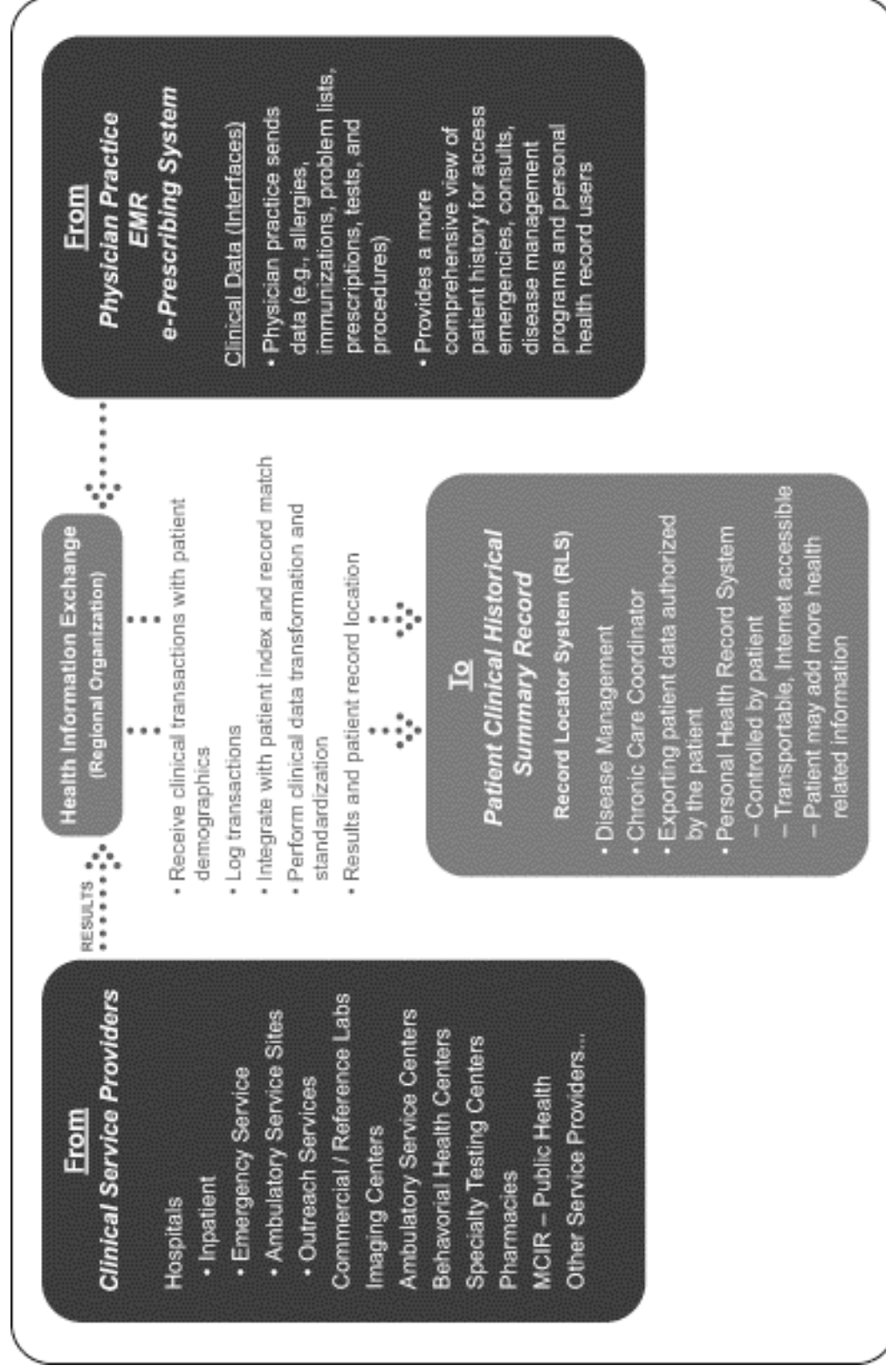
Tom is an insulin-dependent diabetic who is recording his diabetic information in a notebook. He has a visit with the diabetic nurse at the endocrinologist's office and brings along his notebook. The nurse takes the notebook and begins writing details from it into Tom's medical record.

Tomorrow's Scenario

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

⁴ Markle Foundation, Connecting for Health: A Private-Public Foundation. "The Personal Health Working Group Final Report on Personal Health Records." July 1, 2003. http://www.markle.org/downloadable_assets/final_phwg_report1.pdf

Diagram H: Phase C - Empowering Michigan Citizens



Impact of Phase C

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

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

Challenges of Phase C

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

Legal Challenges/Issues

- The HIE must carefully consider the nature and scope of its relationship with the patient (in Phases A and B, the relationship is between the patient and health care providers, not the patient and the HIE).
- Legal issues associated with an HIE exporting data directly to the patient vs. the patient having direct access to data within the repository must be examined. Legal and practical issues are likely to arise if the patient has direct access rights to information held by the HIE, especially if the patient is able to add or change data in any way.
- Determination of who has access rights and developing the process to ensure only authorized users can see patient data will need to be addressed. These include patient designees (e.g., designees under Powers of Attorney for Health Care, additional clinicians, other third parties) and individuals who are legally authorized to act on patients' behalf (e.g., guardians, parents of minors).
- If the system is designed to allow patients to authorize and direct the HIE to release information for non-clinical uses, the complexity of the system and potential for errors are increased.

Technical Challenges/Issues

For more details regarding overall technical issues and resources see Appendix H: Technology Overview

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

Financial Challenges/Issues

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

Role of State of Michigan Government

To maximize the benefits of continued support, funding and advocacy of regional initiatives throughout the state, it is vitally important to seek the most economical and easily deployable means to realize the benefits of secure and available HIE. The main role of the State of Michigan government is as a statewide convener and collaborator. Thirty-eight states across the country are taking the lead and promoting and encouraging dialog, convening stakeholders and providing guidance to health information exchange. Governor Granholm, MDCH and MDIT are taking a leadership role in offering support and guidance to Michigan's fledgling regional health exchanges and are taking steps through this project to integrate the activities of Michigan's local and regional efforts. Though most decisions regarding the scope and the direction of HIT and HIE initiatives will, and must be made at the regional level where healthcare is delivered, the following recommendations should be implemented at the state level to support the MiHIN vision and Michigan's HIE initiatives:

Legal Interpretation and Consensus

1. Reduce Legal and Regulatory Restrictions for the Sharing of Electronic Health Data

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

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

2. Facilitate Statewide Consensus of Legal Opinion

Today there are federal and state laws that are in conflict. This adds to the complexity of implementing HIE and HIT. In order to encourage participation in regional initiatives by potential HIE participants regarding the possible violation of federal and state law, the State needs to facilitate consensus of legal opinion statewide. For example, the federal Stark Law limits the

investment options to provide physicians with HIT subsidies. A clear process should be created for obtaining either one or more advisory opinions from the federal government on behalf of all Michigan regional initiatives about Stark Law compliance. This would permit reliable guidance and address concerns for consistency across all regional initiatives. Additionally, rules should be promulgated to incorporate revisions to the federal Stark law so that federal and state Stark prohibitions and exceptions are the same. Similar consensus of opinion regarding security and privacy issues will also be needed.

Standard Setting/Technical Support

1. Advocate for the Use of National Standards (e.g., for interoperability)

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

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

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

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

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

4. Identify and Develop HIT and HIE Solutions for Medically Underserved Areas, Technology Challenged Areas or Areas Falling Between Regional HIEs

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

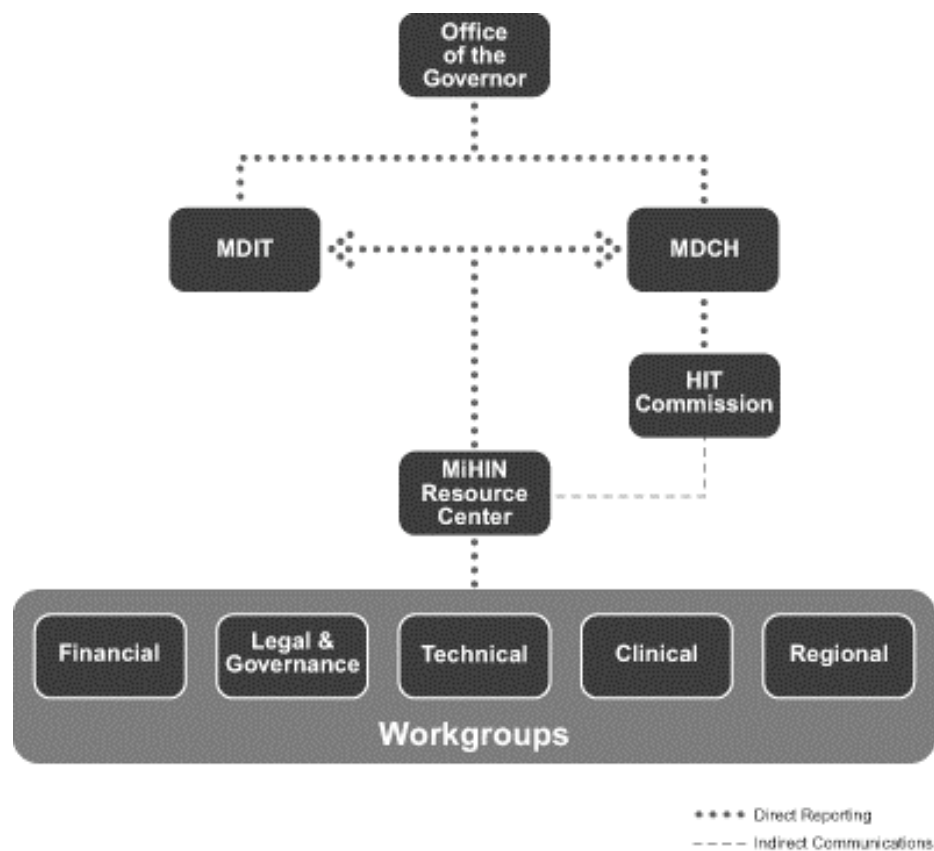
Statewide Coordination

1. Establishment of a MiHIN Resource Center

With respect to operations, a statewide HIE coordinating body (MiHIN Resource Center) should be established and funded to provide day-to-day governance, guidance, direction and coordination to the design and implementation of regional HIEs and statewide exchanges. The role of the MiHIN Resource Center is to assist the regional HIE efforts across the state, focusing daily on operations such as resource staffing and communications in order to increase the

adoption rate and successful implementation of regional HIEs across Michigan. The MiHIN Resource Center should have full-time staff that will coordinate tasks and deliverables to the regional HIEs and Michigan Department of Community Health. The Resource Center would be responsible for working with national resources (eHealth Initiative, Markle Foundation, etc.) As discussed previously, health care is local and, as such, the exchange of health care information occurs primarily within medical trading areas. However, there are many areas that regional HIEs will need assistance with including, but not limited to: interpreting legal statutes, representation at state and national levels, identification and promotion of standard policies, procedures for HIE operation, governance, and financing as well as for technological infrastructures and education and awareness about national initiatives and standards.

Diagram I: MiHIN Resource Center



Several specific recommendations have been made regarding the activities of this Resource Center:

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

Promote and guide the regional HIEs regarding national standards and serve as the primary resource for HIE information and the dissemination of the MiHIN Resource Guide. It will develop guidelines that will align with national standards, assist in the removal of common obstacles across the regional HIEs and resolve conflicts between regional HIEs to facilitate

equitable and appropriate data sharing for the benefit of patients. It will also provide guidance regarding the interpretation of applicable laws and regulations, and when appropriate, seek definitive interpretations from state and federal regulators. The selection of the legal structure for this Resource Center will need to be carefully considered, specifically the risks and benefits of creating a private corporation versus a quasi-public agency should be examined.

B. Utilize Workgroups in an Advisory Role

Using a modified version of the MiHIN *Conduit to Care* workgroup structure would allow the Resource Center to take advantage of the work and knowledge of members who have already been involved in this process. All advisory workgroups would be responsible for conducting appropriate research and engaging in meaningful dialogue regarding topics of interest to the MiHIN Resource Center. Additional details regarding the workgroup objectives and recommended members can be found in Appendix I. Also see recommendation two on the following page.

C. Manage Workgroups and Ad Hoc Advocacy Groups

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

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

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

E. Continue Development of a Reference Guide for Regional HIE efforts

A Reference Guide has been initiated by the Regional Workgroup in order to provide guidance to those individuals and organizations undertaking the formation of a regional HIE. The use of the Reference Guide in the state of Michigan can also ensure consistency among start-up efforts. This guide is a suggested step-by-step process for the initial phase of regional health information exchange efforts, and includes numerous references to other sources of information as well as sample documents. The development of this reference guide should continue under the direction of the MiHIN Resource Center and be made available through the Resource Center or the Michigan Department of Community Health.

2. Leverage Existing MiHIN Resource Center Workgroup Structure

The HIT Commission will need to create advisory workgroups to address issues needing specific expertise, as defined in P.A. 137-2006. Advancing the MiHIN Resource Center workgroup structure would allow the HIT Commission to take advantage of the work and knowledge of members represented in the those Workgroups. All Workgroups will be responsible for

conducting appropriate research and engaging in meaningful dialogue regarding topics of interest to the HIT Commission and MiHIN Resource Center. The Workgroups would also provide recommendations to the HIT Commission and MiHIN Resource Center regarding various aspects of HIE development.

3. Provide Resources to Michigan's HIT Commission

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

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

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

5. Conduct Statewide Medical Trading Area (MTA) Analysis

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

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

- Provide guidance on who the stakeholders are
- Provide a framework for understanding services in the area
- Understand the critical mass mostly likely needed for sustainability

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

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

Fundraising and Administration of Statewide Funding

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

Financial incentives should be aligned with funding for HIE initiatives. Such funding will be critical to facilitating the growth of HIEs throughout Michigan. The state should advocate for continued state and federal funding while encouraging participation and funding from other stakeholders (e.g., employers and payers). Inadequate funding for the early stages of health information exchange initiatives can be a barrier to entry. The Michigan legislature has begun to remove this barrier by appropriating funds for health information exchange projects in the fiscal year 2007 budget.

Specific criteria should be developed and eligibility determined for the awarding of funds and to ensure that funding is aligned with the goals of the MiHIN *Conduit to Care*. Based on the input from the *Conduit to Care* process, the following goals, objectives and eligibility criteria are recommended to be used by the Michigan Department of Community Health as they begin the proposal process for distributing the funds appropriated for health information exchange projects across Michigan.

A. Goals for Funding

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

B. Objectives

- i. To prove that there is a return on investment associated with the implementation of a health information exchange
- ii. To ensure the development of infrastructure and processes to facilitate, over time, the interconnection of health information across the state of Michigan
- iii. To allow for the HIT Commission to quantify the value of such activities as outlined in Section (i) (2) (a) – (k) of the HIT Commission bill

- iv. To ensure that Michigan begins to gather “best practices” as they relate to health information exchange
- v. To ensure that the infrastructure that is adopted is available to all constituents throughout Michigan

The following details are recommendations from the Regional Workgroup regarding goals and eligibility criteria by category. Two categories, planning and implementation, have been defined based on the stages of regional initiatives within the State of Michigan. It is recommended that these details be utilized by MDCH as they draft the actual proposal process for distributing funds.

A. Planning Category – Support for planning projects

- i. Goal Statement: To develop a feasible plan for the implementation of a health information exchange that will follow adopted standards and show how they plan to improve the quality of health care in Michigan.
- ii. Eligibility Criteria: Organizations representing regional initiatives competing for awards under the program must meet the following eligibility criteria:
 - a. Planning a formal organization
 - b. Planning to use state and national adopted standards (based on availability)
 - c. The Applicant must provide a Letter of Intent including names and signatures of stakeholders for the following reasons:
 - 1. Multiple and diverse stakeholders are critical to the success of a region or community effort in the decision-making processes related to the project. Such stakeholders may include but are not limited to practicing clinicians, health plans, hospitals, laboratories, public health, patient groups, purchasers, and the state, in some capacity.
 - 2. The applicant must plan to engage the commitment of purchasers and/or payers representing, in total, a critical mass (approximately 60%) of the covered lives in the area covered by the health information exchange project.
 - 3. The applicant must plan to engage the commitment of a significant percentage of practicing clinicians to utilize the health information exchange capabilities included in the project
 - d. Demonstrate the plan for consumer engagement and education
 - e. Demonstrate how the HIE will interact in public health reporting
 - f. Must provide proof of matching funds (specifics to be determined)
 - g. Review Medical Trading Area analysis and statistics to determine:
 - 1. Medicaid population served
 - 2. Sixty percent of services (as defined by the HIE) are provided within community of stakeholders (e.g., the region)
 - h. Willingness to document outcome measures including steps taken during funding period, successes achieved, obstacles encountered, next steps and associated time lines for anticipated future activities.
 - i. Health information exchange is open to the entire community
 - 1. Definition of a model that is open to all parties (Payers, Providers, Employers), including all technology vendors able to operate within a set of interoperability standards

2. Established under the premise of being an independent third party. This will facilitate the participation of normally competing organizations.

B. Implementation Category – Support for implementation projects

- i. Goal Statement: To implement a health information exchange project that has a highly developed feasible plan for implementation that includes measurable outcomes and a high level of stakeholder involvement.
- ii. Eligibility Criteria: Organizations representing regional initiatives competing for awards under the program must meet the following eligibility criteria:
 - a. The applicant must be a formal organization.
 - b. The applicant must have a business plan.
 - c. The applicant must have engaged multiple, diverse stakeholders in the region or community in decision-making processes related to the project, including but not limited to practicing clinicians, health plans, hospitals, mental health facilities, laboratories, public health, patient groups, purchasers, quality improvement organizations, and the state, in some capacity.
 - d. The health information exchange capability included in the project must use state and national technical standards within 12 months of their becoming available.
 - e. At least two types of data must be initially planned for exchange by the health information exchange capability, such as laboratory data, medication data, outpatient or inpatient episodes, claims data, etc.
 - f. Planned data exchange must occur between at least three different stakeholder groups, who cannot be a part of the same legal entity.
 - g. The applicant must have engaged the commitment of purchasers and/or payers representing, in total, a critical mass (approximately 60%) of the covered lives in the area covered by the health information exchange project.
 - h. The applicant must have engaged the commitment of a significant percentage of practicing clinicians to utilize the health information exchange capabilities included in the project
 - i. The applicant must be willing to share resources and lessons learned in the process; sharing information is vital to producing a productive health information exchange.
 - j. The applicant must plan and show the progress of their use of funds and have proof of sustainability.
 - k. Applicants must plan to develop specific, quantifiable milestones and benchmarks to achieve substantial improvement in three areas
 1. Performance measures and public reporting
 2. Capacity to help physicians in the community improve the quality of ambulatory care
 3. Consumer engagement
 - l. The applicant must show how it would contribute to the already established health information exchange efforts in Michigan.
 - m. The applicant should consider a marketing plan for communicating quality improvement efforts considering that:
 1. Providers need support to improve care
 2. Purchasers need to reward good care

3. Community leaders need to be engaged (civic, business, health care)
4. Patients and consumers need to understand what must be exchanged and that they are participants in that process
- n. Applicant must show they have considered the sustainability of the proposed effort relating to technical, clinical and financial aspects.

Education and Marketing

1. Encourage Additional Collaboration and Communication Amongst Stakeholders Regarding MiHIN *Conduit to Care*

During the course of this project the volunteers provided valuable insight into the state of health care in Michigan and learned about Health Information Exchange and its role in providing increased quality of care and patient safety as well as decreasing health care costs. To this point, stakeholders from communities across Michigan should be encouraged to provide feedback on the *Conduit to Care*. It has been recommended to accomplish this through regional town hall meetings conducted in at least four regions across Michigan to discuss the *Conduit to Care* recommendations. During this timeframe, input and guidance would be sought from the entire community. Such meetings would also provide an opportunity to further educate consumers and promote consumer/patient involvement and to discuss the next steps to be taken.

In order to clarify and refine the issues addressed in this report, and to gain understanding and support of the healthcare community in order to move these concepts into reality, it is important to reach out to clinicians across the state. This can be done using the partnerships with the medical societies, the hospital association, and other healthcare professional societies throughout Michigan. Consumer/patient understanding and support are also critical to the future success of HIE. As such, reaching out to the Michigan public through mechanisms other than the forums previously discussed is also important. This can be done in collaboration with existing patient and consumer coalitions and through the educational efforts of state government.

VI. CLOSING

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

In order to maintain the momentum established over the past several months and to transition the *Conduit to Care*, there are immediate activities to be performed. First and foremost is the establishment of the statewide coordinating structure (MiHIN Resource Center) and the need to orient the HIT Commission to the recommendations and details provided in the report. Funding has been approved in Michigan's Department of Community Health's budget to implement these activities. Other immediate actions that can be performed by the MiHIN Resource Center include:

- Development of a marketing and education plan for the *Conduit to Care*
- Creation of consumer brochure informing about the *Conduit to Care* and HIE
- Continuation of the development of resource guides and tools for regional HIEs
- Coordination with the HIT Commission to develop a Request for Proposal process for regional HIE funding

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

VII. APPENDICES

Appendix A: Participants & Workgroup Chairs

Creation of the Michigan Health Information Network Final Recommendations would not have been possible without the contributions of the following individuals. Their knowledge, input, assistance, teamwork and dedication were essential to the successful completion of the Final Recommendations. The content presented in this report is a direct result of thousands of hours of volunteered time.

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Tracy Smith
Paula Smith
Thomas Smith
Mary Smith
Doug Stacy
Donald Stapleton
Jeanne Strickland
Noah Stromer
Jim Sundberg
Bob Swanson
Mick Talley
Akkeneel Talsma, Ph.D.
Joseph Tan, Ph. D.
Robert Tennant
Fay Thiel
Paul Toenjes
Teri Vantongerren
Kevin Trovini
Tisa Vorce
Larry Wagenknecht
David Wanner
Richard Warren
Jeff Weihl
Shelly Weisburg
Donald Wheeler
Linda White
Diane Whiton
Bruce Wiegand
Sue Wiljanen
Cynthia Wisner
Ed Wolking
Joel Wortley
Joe Yelanich
Deborah Zannoth
Michael Zaroukian, M.D.
Richard Znidarsic

APPENDIX B: MIHIN CONDUIT TO CARE WORKGROUP DESCRIPTIONS

The **Clinical Workgroup** was responsible for defining patient and clinician-focused criteria (i.e., breadth and reach, major drivers, feasibility, impact and urgency) in order to allow prioritization of key process flows representing various aspects of health care delivery and communication that would be implemented as Michigan continues towards a Health Information Network. All Workgroups depended on the Clinical Workgroup to deliver these “real world examples” (use cases) for the first key process flow identified. They also identified key barriers to adoption, necessary participants, benefits to clinical beneficiaries and recommended strategies for working with the identified community to clear any barriers.

Participants were asked to rank the various health care categories and issues in terms of urgency, help define the major drivers the Clinical Workgroup (with assistance from other Workgroup members), utilized a survey to rank potential outcomes as urgent “pain points” for health information technology and exchange to determine the most important health system improvements needed. Planners were asked to answer the same questions first as health system professionals, and then as patients or family caregivers. The emphasis on quality, safety and efficiency was reaffirmed as the same participants ranked the urgency of more granular outcomes. Responding as professionals, accessing a patient’s information from across multiple providers towered over the priority ranking of alternative outcomes in all settings. This was followed by the goal of enhancing provider collaboration. From both a health care professional’s and patient’s perspective, the outcome of clinician access to a patient’s clinical information from across provider organizations (to improve the quality, safety and efficiency of health care) was given highest priority.

The **Financial Workgroup** was accountable for articulating the benefits and beneficiaries of investments in HIE and HIT. The Workgroup was also responsible for examining the approaches and successful examples of financial strategies to increase adoption of HIT and health data exchange from efforts within Michigan. Including the appropriate role of public and private sectors, proposing financial strategies for funding HIT and health data exchange (start up and long-term) were other tasks the Financial Workgroup was charged with completing.

The **Governance Workgroup** was tasked with creating a shared vision and plan for addressing healthcare challenges through information technology and health data exchange in Michigan. The focus of this workgroup was to develop a draft shared vision statement, guiding principles and operations of a regional and a statewide collaboration between all stakeholders. The workgroup also examined successful governance strategies used by existing regional health information exchange initiatives and statewide initiatives in an effort to understand the possible applications of healthcare IT in the state of Michigan.

The **Legal Workgroup** understood and researched regulatory issues regarding health information exchange and health information technology. They were expected to identify state laws that provide a barrier to HIE, provide recommendations to ensure that HIEs comply with HIPAA, Stark, etc. and to ensure that HIEs represent consumer interests.

The **Regional Workgroup** researched and interviewed all growing and developed regional health information exchanges in Michigan. One of the goals for the Regional Workgroup was to define the State of Michigan's role in supporting regional Health Information Exchanges. They were to identify key barriers to adoption of a regional HIE and recommend strategies. The Workgroup also identified critical success factors and criteria for HIEs and Medical Trading Areas.

The **Technical Workgroup** identified principles and concepts applicable to HIT technologies and also produced several deliverables. The deliverables include:

- A delineation of the differences between HIT and HIE.
- Collaborated with other Workgroups to develop a three phase Michigan model for the evolution of the Electronic Patient Health Record, and identified technology barriers and challenges associated with each of the three phases.
- Identified and described core HIE technological requirements
- Assessed major options/examples of technical architectures used by HIE initiatives.
- Reviewed research and advisory service (e.g., Gartner) findings and prognoses on RHIO-related issues and technologies.
- Reviewed the status of existing HIE-related activities in Michigan via presentations made by the participants.
- Reviewed and assessed the inventory of existing State of Michigan technical infrastructure resources and increase understanding of what infrastructure resources can be leveraged. One of the more detailed assessments "Report on EXR Implementation in the State of Michigan", by BCBSM and the Partnership for Michigan's Health (March 22, 2006) is described in Appendix D.

An **Executive Leadership Team** consisted of the Steering Committee co-chairs, staff from MDCH, MDIT, the Michigan Public Health Institute, Health Network Services Group, and CyberMichigan. The Executive Leadership Team guided the day-to-day details and operations for the project and provided guidance and assistance for the Project Management Team on an as-needed basis. They also provided a line of communication between the Governor, the Steering Committee and the Project Team.

A **Project Management** team compiled all presentation materials, and organized scheduling and logistics. The Project Management team reported to the Executive Leadership Team and Steering Committee.

An **Advisory Group** made up of cabinet-level Directors of the State of Michigan Departments of Community Health, Information Technology, Corrections, Labor and Economic Growth, Civil Service, Veterans Affairs, Management and Budget, and Human Services reviewed the progress of the *Conduit to Care*.

The table below outlines the project activities and impact on the project.

Project Activity	Impact
Weekly Project Management Meetings	<ul style="list-style-type: none"> Increased awareness of activities and scope management
Weekly Coordination Calls	<ul style="list-style-type: none"> Increased communication among workgroup leadership
Steering Committee Meetings (Five meetings total)	<ul style="list-style-type: none"> Established expectations and roles Provided leadership for the process and a communication channel between the Governor and Steering Committee
Workgroup Meetings (25 meetings total)	<ul style="list-style-type: none"> Identified urgent and feasible priorities Developed recommendations for the <i>Conduit to Care</i>
Advisory Group (Two meetings total)	<ul style="list-style-type: none"> Identified issues within State of Michigan government Ensured alignment of MiHIN with current, on-going or planned State of Michigan government activities
Integration Days (Three half-day sessions)	<ul style="list-style-type: none"> Increased communication and understanding between workgroups Reviewed all workgroup work Verified recommendations for feasibility and urgency

APPENDIX C: MICHIGAN'S UNIQUENESS

In helping foster HIE, Michigan shares many barriers and challenges with other states but also has unique strengths and opportunities that can be built upon to help ensure success. These include:

1. Vision, Leadership, Landmark Policy and Program Alignment

The state is providing a strong vision, leadership and direction on health IT. Complementing this is the exceptional program and policy alignment at the state level, between the Governor and legislature, and at the Departmental level, not only MDIT and MDCH but also among the associated programs and support services. In addition to MDCH and MDIT, these include the Departments of Labor and Economic Growth, Human Services, Civil Service, Corrections, Military and Veterans Affairs and Management and Budget.

Further, information technology and Health Information Technology (HIT) are fully integrated within the Governor's Cabinet Action Plan (CAP) and the Michigan IT Strategic Plan. Michigan is one of the few states with a state enterprise level policy and program plan, and has received national recognition for its integrated CAP and IT planning process from the Government Performance Program (2005).

Some recent policy and program alignment highlights include:

- **Goal and Program Alignment:** Health and Human Services is one of the six goals in the Cabinet Action Plan. The Michigan Health Information Network is a priority in the CAP as well as the state IT Plan.
- **Gubernatorial Support:** The Governor gave full support and guidance to MiHIN in the 2006 State of the State message.
- **Legislative Support:** PA 137 of 2006 established a Health Information Technology Commission, and funding for regional HIEs has been provided in the 2006 07 FY budget.

2. Critical Mass of Stakeholders

In part because of Michigan's unique automotive manufacturing and union history, and the role of the state and federal governments in health care, a comparatively small number of major HIT-related stakeholders serve a very large share of Michigan's population. Thus, a critical mass of stakeholders and participants can be catalyzed at the state level and in selected regions more readily than in many other states. Stakeholders are willing to work together to identify areas in which they should be collaborating. Many have already taken significant health IT-related actions on their own or in tandem with others, and are participating in the MiHIN deliberation and design process.

- Three payers, Medicaid, (15%), Medicare (26%) and BCBSM (47%) represent 88 percent of the insured population in the state.
- Major stakeholders participated in the 2005 Public Sector Consultants (PSC) sponsored forums, the MiHIN work groups, as well as in the development of regional HIEs. Major stakeholders include providers, payers, employers, labor unions, public health professionals and consumers.
- A number of existing and emerging initiatives illustrate the strength, as well as the regional vitality of provider, payer and employer commitments.
- Blue Cross Blue Shield of Michigan's (BCBSM) web-DENIS Provider Portal is a fully functional payer-provider portal. Providers can access information relevant to claims, prior authorization, and can validate BCBSM member eligibility and benefits. In March of 2005, the web-DENIS feature began allowing Michigan Medicaid providers to access Michigan state program beneficiary eligibility and benefits information. The Michigan state program beneficiary information is handled via a cooperative arrangement between BCBSM, Michigan Department of Community Health (MDCH), and Michigan Public Health Institute (MPHI).
- Computerized Physician Order Entry (CPOE): Major National and Regional Health care Delivery Systems all invested in CPOE. The investment in major HIT systems for these hospitals with special emphasis in CPOE has surpassed a half-billion dollars in this decade. Many initiatives like these have been in support of initiatives like "Leapfrog" and "Bridges to Excellence".

3. National Caliber IT Capabilities and Foundation of Experience

The prestigious Center for Digital Government survey recognized Michigan as the number one digital state in 2004 (the most recent year when the award was given) for its IT-based service delivery, architecture and infrastructure, collaboration, and leadership. These national caliber planning and management capabilities are being applied to the *Conduit to Care* project.

Also, MDIT has an established and extensive cross-boundary (XB) program, with shared cross-jurisdictional governance in multiple areas. The Office of Technology Partnerships was established in 2003 to foster technology collaboration and partnerships with business, K-12, universities, non-profits, and local units of government. IT Plan goals call for sharing, collaboration and a statewide community of partnerships. In 2006 MDIT developed a formal cross-boundary strategic and operational framework, bridging internal and external IT solutions. Preliminary areas include, land use, broadband, and "joined-up government" business licensing and development (MiTAPS expansion). This process is further integrated with enterprise architecture (EA) refinement,

Michigan has had extensive experience with many health IT approaches and projects: telemedicine, vital records, immunization registry, disease surveillance, Medicaid management, pharmaceutical pricing and others. Selected examples include:

The Michigan Care Improvement Registry (formerly the Michigan Childhood Immunization Registry) (MCIR) is an award winning, state-of-the-art electronic, statewide immunization tracking system for all citizens who receive, or are offered, immunizations anywhere in the state of Michigan. This system is accessible to both private and public providers and was just recently expanded to people of all ages.

The Michigan Disease Surveillance System (MDSS) has been in operation since December 2003 and currently receives 2500 emergency department registrations per day from over 20 facilities. The System is designed to facilitate public health rapid detection and response to unusual outbreaks of illness that may be the result of bioterrorism, outbreaks of infectious disease or other public health threats and emergencies.

The Medicaid Management Information System (MMIS) is a next generation, automated management and control system for the Michigan Medical Assistance Program (Medicaid). MDCH and MDIT are currently engaged in an effort to replace the existing MMIS for the State of Michigan, which was first developed in the late 1970s. Michigan will be the third state in the nation to implement this cutting edge suite of products.

Health Level Seven (HL7) is a not-for-profit organization based in Ann Arbor, Michigan. This American Standards National Institute (ANSI) accredited Standards Developing Organization (SDO) is recognized internationally for its dominance in the messaging standardization of health care clinical and administrative data.

4. Historic Economic Pressures and Restructuring Serve as Challenges and Drivers

Michigan has been undergoing a historic restructuring of its economy, particularly in its automotive manufacturing sector. These manufacturers are finding themselves increasingly disadvantaged in the global marketplace and this has resulted in resource constraints (human and financial) and restrictions in both the private and public sectors, including for health care. These restrictions or reductions have been juxtaposed by continuing or increased demand for services and increased costs. Rapidly growing health care costs are well documented for both the public and private sectors in our state. Government, employers and employees have all been affected.

This issue was first addressed at the Governor's 2003 Summit on "Manufacturing Matters in Michigan", when a consensus was reached on the urgent need to develop practical steps at the

state and federal level to address employer-sponsored health benefits for employees and retirees.

The 2005 Governor's Council of Economic Advisors December 2005 report "Recommendations to Reduce the Economic Burden of Providing Employer-Sponsored Health Care Benefits" addresses some of the drivers and trends for both the public as well as manufacturing sectors, and called for health care information technology infrastructure reforms. The report found that:

- Total government outlays from all sources (including federal) spent on direct health care purchases in Michigan in 2004 exceeded \$10 billion, accounting for more than 25 percent of the state's total budget and more than one-third of its General Fund.
- The Big Three Automakers spent \$10 billion in employee/retiree health care in 2004, half of which was spent in Michigan.
- The combined health care expenditures by the Big Three and the State of Michigan in 2004 exceeded \$15 billion, accounting for 24 to 26 percent of Michigan's total expense for health care goods and services.

Health care-related changes and disruptions reverberate throughout Michigan's economy because, in addition to the sizeable impact of health care-related costs to the overall economy, health care is Michigan's largest employer, providing more than 726,000 jobs, \$30 billion in wages and salaries, and \$8 billion in taxes.

5. Geographic, Service Scope and Diversity Call for Regional Solutions

Michigan's geography, history, demographics and evolution of health markets has resulted in distribution of population and services that initially is best served by multiple regional HIE initiatives. The state has two geographically separate peninsulas and a smaller one in the form of the "Thumb", land borders with four states and three border crossings with Canada, and a balance of urban to rural population above the national average.

- The U.S. Office of Management and Budget identifies 15 Metropolitan and 18 Micropolitan Statistical Areas in Michigan, accounting for 92 percent of the population and 49 counties. Cass County is part of a Metropolitan Statistical area shared with Indiana.
- According to the Dartmouth Atlas there are 109 hospital service areas and 15 referral regions in Michigan. Southeast Michigan is very diverse and functionally equivalent to several regions.
- Another measure of regional distribution of markets is the profile of counties with the most direct health care jobs. The top ten counties are: Wayne, Oakland, Kent, Macomb, Washtenaw, Genesee, Ingham, Kalamazoo, Saginaw and Ottawa.
- The MiHIN regional interview process identified at least eight entities that were at some stage of recognition or discussion, organization, design, implementation or operation.

- Due to market area distribution and density, parts of the state may either be served by more than one market area or be underserved.

6. *Conduit to Care* Built on Michigan Strengths, Unique Needs and Experience

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

- Catalyzing the stakeholders through "Health Information Technology in Michigan" stakeholder forums during 2005.
- Reliance on seasoned, independent professionals to manage all aspects of the project from MPHI, eHealth Initiative and Health Network Services
- Grounding in an explicit framework for incrementally evolving HIE in Michigan

APPENDIX D: HIT PROJECTS IN MICHIGAN

I. AHRQ Funded Health Information Technology Projects⁵

Three entities in Michigan were awarded (beginning in 2004) a three year total of \$2.9 million from the Agency for Healthcare Research and Quality (AHRQ) to develop HIT projects. A fourth entity was awarded an AHRQ grant in 2005 to develop an HIT project.

A. HIT Planning for a Critical Access Hospital Partnership

Description: Plans, develops, and implements HIT to assist rural communities in improving health care access, building local and regional resources to monitor the quality of health care and expanding the use of HIT educational, communication, and clinical applications.

Abstract: Six Critical Access Hospitals located in Michigan's Upper Peninsula have united as the Michigan Upper Peninsula Health Information Partnership to improve patient safety and quality of care through the regional planning, development, and implementation of HIT. Each hospital has agreed to commit its organizational resources, support and participation in: (1) a 12-month, joint HIT planning process; (2) implementation of the HIT plan; (3) the use of the regional HIT system to assist local rural communities to improve health care access; (4) building local and regional resources to monitor the quality of health care; (5) expanding the use of HIT educational, communication, and clinical applications in the region; and (6) submitting a Network grant to the AHRQ to help fund HIT strategies identified in the regional HIT Plan and measure its impact on patient safety and both the quality and costs of care. The HIT planning and implementation activities of this Six-CAH Hospital Network will be used by Michigan's Center for Rural Health as a template for adoption and inclusion of Michigan's 12 other Critical Access Hospitals and other state CAH programs. The Planning Director, with the help of HIT clinical and technical experts, will work with a Planning Committee, comprised of the CEO and HIT Officers of each hospital. Over the 12-month planning process, the Committee will define the current situation, define areas of focus and Network goals, evaluate and prioritize strategies, define measurable HIT outcomes, agree to the Network's ongoing evaluation process, adopt the final regional HIT plan, and conduct an evaluation of the HIT planning process.

Estimated Total Funding: \$193,848 (Year One Funding: \$193,848)

Principal Investigator: Donald Wheeler

Applicant Institution: Baraga County Memorial Hospital (L'Anse, MI)

Community: Rural

Technology: Telehealth, HIE, EHRs, CPOE, Clinical Decision Support

Care Setting: Ambulatory

Grant Number: P20 HS15004 (9/30/04 – 9/29/05)

⁵ <http://healthit.ahrq.gov/portal/server.pt?open=512&objID=654&PageID=5585&mode=2&cached=false&state=Michigan>

B. Bar-coding for Patient Safety in Northern Michigan

Description: Implements a bar-coding application to an existing integrated HIT network that alerts providers to potential drug interactions and allergic reactions, tracks “near misses”, and provides a permanent record of the patient’s medication history that is accessible by providers at any site.

Abstract: Five partnering hospitals in northwest lower Michigan have collaborated to create a system of health care that involves an integrated computer network. This network offers a single repository for the storage of all patient information and allows the sharing of technology that can enhance patient safety. Goals and initiatives at all hospitals are focused on reducing adverse drug events and medication errors. These events and errors occur at several places along the medication chain, including ordering medication, transcribing physician orders, dispensing medication, and administering medication. A solution to this serious problem, therefore, must consider all of these phases. Plans have been completed to address errors at the dispensing, ordering and transcribing phases through computerized pharmacy and CPOE applications, but these approaches do nothing to correct the 34 percent of errors that occur at the end of the medication chain, namely its administration by nursing staff. A bar coding system that is proposed for installation will fill this lapse and provide an important safeguard for hospitalized patients. It will ensure that the right medication in the right dose is given to the right patient at the right time by an administrator who is qualified and authorized to give it. It will offer alerts regarding potential drug interactions and allergic reactions. It will provide a permanent record of the patient's medication history, accessible by health care providers at any site within the partnership. It will track "near misses," so that more errors can be avoided in the future. It will save many of the thousands of dollars that are spent in repairing the damage done by each medication error, lead to better health outcomes for patients, and improve the health of our communities. The bar coding application, offered by the vendor Cerner, will be installed in all six hospitals sequentially over a period of two-and-a-half years. At the end of this period, the hospitals will be willing to share system design and lessons learned.

Estimated Total Funding: \$1,254,250 (Year one Funding: \$500,000)

Principal Investigator: Randi Oehlers

Applicant Institution: Munson Medical Center (Traverse City, MI)

Community: Rural

Technology: Pharmacy Information System, CPOE, Bar Coding, Personal Digital Assistants, Wide Area Network, Wireless, Electronic Medication Administration Records, Medical Information Systems

Care Setting: Inpatient

Grant Number: UC1 HS14878 (9/20/04 – 9/29/07)

C. HIT Support for Safe Nursing Care

Description: Examines the use of the HANDS software system, an HIT-supported care planning process for nursing care, and its ability to be transferable between nurses, units, and health care settings.

Abstract: To enhance safety culture and reduce errors in hospital units, lessons from high-risk industries can increase effectiveness of HIT-supported nurse care-planning and record-keeping. This three-year project supports the care planning process by standardizing and structuring the activities surrounding it, and making it transferable between nurses on one unit, between units, and among health care settings. The central hypothesis is that the reengineered HIT-supported care planning process leads to a safety culture through the development of greater "collective mind", "mindfulness", and "heedful interrelating" among nurses across time and settings to facilitate information flow. The specific aims of this project are: 1) to demonstrate that HIT can be successfully implemented to support nurses in a dynamic care planning process encompassing both the planning and provision of care within units and across health care settings; and 2) to demonstrate that a HIT-supported care planning process leads to a stronger safety culture. A convenience sample of eight nursing units (four units in year one, four units in year two) in five health care organizations will complete the care planning training and implement the Hands-on Automated Nursing Data System (HANDS) care planning process under real-time conditions to test standardization and improvement in communication and enhancement of a safety culture. Data analysis and interpretation will inform the long-range goal of a future real-time implementation in settings across the country, leading to interdisciplinary integration and informing execution of an EHR.

Estimated Total Funding: \$1,486,634 (Year One Funding: \$490,658)

Principal Investigator: Gail Keenan

Applicant Institution: Regents of the University of Michigan (Ann Arbor, MI)

Community: Urban

Technology: Internet, Clinical Decision Support

Care Setting: Inpatient

Grant Number: RO1 HS15054 (9/01/04 – 8/31/07)

D. Implementation of a Regional HIT Network by 10 Critical Access Hospitals

Description: Establishes a Web-based EMR system for 10 small rural hospitals to connect them to the area's regional medical center (Marquette General Hospital). The project's ultimate goal is to quickly give all providers access to patient data, eliminate duplicate tests and exams, deliver high-quality care, reduce medical errors, and track health outcomes.

Abstract: During the past year, ten independently owned and operated Critical Access Hospitals (CAH) located in Michigan's Upper Peninsula joined with the region's only medical center to form the Michigan Upper Peninsula Health Information Technology Network to improve patient safety and quality of care through the regional planning, development, and implementation of HIT.

The Network is creating a web-based, portal/repository application that allows selected clinical information to be accessed by authorized physicians and other health care providers for patient care delivery and quality reporting. The IT infrastructure connecting the participants is already in place and used for video teleconferencing and patient education. Network HIT applications will include: (a) HIT systems at each partner hospital that capture and send patient demographic and clinical data to the regional data repository; (b) a regional HIT master patient index/unique patient identifier; (c) a regional HIT interface engine to accept and reformat incoming data from the Partner HIT systems; (d) a regional HIT clinical data repository that contains a consolidated summary of patient information; and (e) a web-based portal viewer allowing clinical information to be accessed by providers.

Project goals include: (1) Establish data vocabulary and exchange requirements to ensure comparability and interoperability; (2) Install local network HIT systems in a phased manner; (3) Implement the regional HIT systems and associated support services; (4) Implement the local HIT to regional data sharing components; (5) Analyze and verify the data and technology-related aspects of the project; (6) Evaluate the impact of the HIT Network on patient care delivery; and (7) Evaluate the success of the implementation.

During the planning and implementation phases, the Partners will contribute \$5,746,091 of in-kind staff support and HIT systems to the project. The project results will be shared with other Critical Access Hospitals, and other state CAH programs.

Estimated Total Funding: \$1,484,167 (Year One Funding: \$498,506)

Principal Investigator: Donald Wheeler

Applicant Institution: Upper Peninsula Health Care Network (Marquette, MI)

Community: Rural

Technology: Telehealth, HIE, HER, CPOE, Clinical Decision Support

Care Setting: Ambulatory

Grant Number: UC1 HS16152 (9/30/05 – 9/29/08)

II. BCBSM and the Partnership for Michigan's Health - Report on EHR Implementation in the State of Michigan

On March 22, 2006, Blue Cross Blue Shield of Michigan and the Partnership for Michigan's Health (comprised of the Michigan Health & Hospital Association, the Michigan State Medical Society, and the Michigan Osteopathic Association) released the findings of a statewide inventory (conducted by KLAS Research) on the use of HIT as it relates to capturing patient health records electronically in the state of Michigan. The goal of this research initiative was to conduct a statewide inventory of successful EHR implementations within Michigan to: (1) reveal the current level of EHR adoption in Michigan; (2) discover the top initiatives that have been successfully implemented; (3) find and describe top provider organizations with solutions designed for deep clinician use, interoperability, and scalability. The report reveals:

- The top 5 large acute care systems with the most active EHR initiatives are: Trinity Health (Novi/Farmington) that includes Saint Mary's Health Care (Grand Rapids), Mercy General Health Partners (Muskegon), Battle Creek Health System, Saint Mary Mercy Hospital (Livonia), Saint Joseph (Macomb), Mercy Hospital (Port Huron) and Saint Joseph Mercy Health System (Ann Arbor); Hurley Medical Center (Flint), Munson Health Care (Traverse City), Spectrum Health (Grand Rapids) and Detroit Medical Center.
- The top 5 small acute care systems with the most active EHR initiatives are: Pine Rest Christian Mental Health Services (Grand Rapids), Schoolcraft Memorial Hospital (Manistique), Central Michigan Community Hospital (Mount Pleasant), Memorial Health Care (Owosso) and Holland Community Hospital.
- The key findings from the top acute care sites:
 - 4 of the top 5 large hospitals are doing CPOE and 1 of the top 5 small hospitals is doing CPOE
 - 4 of the top 5 acute sites are using Cerner as their system vendor
 - Several of the top 5 sites in the acute space are multi-facility IDNs
 - "Physician buy-in" and having "implementation champions" were key to success in the large and small acute sites
 - Providers spoke about successes in improved patient safety and reduced medical errors, fast access to patient records and ROI from reduced costs for paper, filing, FTEs, etc
 - Providers spoke about challenges in barcodes on medication, physicians dragging their feet, cost of implementing HER, and alert fatigue.
- The top five ambulatory sites with over 25 physicians identified with the most active EHR initiatives were: Trinity Health (Novi/Farmington), Michigan State University (Kalamazoo), Michigan Heart (Ann Arbor), Spectrum Health (Grand Rapids) and Michigan State University (East Lansing).

- The top five ambulatory sites with 6 to 25 physicians identified with the most active EHR initiatives were: Lakewood Family Medicine (Holland), Orthopedic Associates of Grand Rapids, Michigan Heart and Rhythm Group (Troy), Silver Pine Family Medicine Child Health (Sterling Heights), and Michigan Multi-specialty Physicians (Ypsilanti).
- The top five ambulatory sites with 1 to 5 physicians identified with the most active EHR initiatives were: the Center for Women's Health Care (Carson City), Holt Family Practice (Holt), Grand Valley Internal Medicine (Grand Rapids), PrimeCare of Novi, and Associates of Family Medicine (Rochester Hills).
- Physicians cited the Top 3 Essential EMR Implementation Elements as: (1) Physician buy-In; (2) Experienced and knowledgeable trainers; (3) Implementation champions (outsource training is last overall).
- Michigan is ahead of the national average for adoption of CPOE as 11% of Michigan's hospitals have added CPOE, compared to the 5.7% nationally.

Among the recommendations in the study⁶:

- Identify the information required to support patient care and safety.
- Continue development of infrastructure to support a regional/statewide EHR in the state.
- Encourage physician buy-in, as it is an essential element to success.
- Involve physicians, payers and hospitals to promote collaboration within the region.
- Target e-Prescribing as a fundamental building block to EHR.
- Define guidelines, standards, formats and infrastructure model and approach.
- Conduct a financial assessment and identify potential funding alternatives.
- Develop incentives to adopt and use technology.

The study also identified barriers to EHR development, including varying computer systems, a mix of nonstandard data elements, inconsistent code sets and medical vocabularies, the need to promote more e-Prescribing and pharmacy integration, and the need for development of unique patient identification solutions.

⁶ http://www.bcbsm.com/pr/pr_03-22-2006_14409.shtml

APPENDIX E: REGIONAL INTERVIEW SUMMARY

In July 2006 the Regional workgroup conducted interviews of self-identified regional initiatives. The process used to conduct these interviews was two or more representatives from the workgroup met with a representative from the self-identified regional effort either via conference call or in-person. The interview template listed below was used for each interview. Not all questions were applicable to all initiatives, depending on their stage of development. During the interviews, previously unknown initiatives were discovered and these initiatives were contacted as well.

Interview Template

1. Is your organization currently exchanging health care information electronically with other providers?
2. If yes:
 - a. How is this occurring (ask them to elaborate):
 - i. Single, enterprise-wide EMR (which one?)
 - ii. Centralized clinical data repository (what's the infrastructure platform?)
 - iii. Clinical messaging service (how does it work and what kinds of data are messaged?)
 - iv. Other
 - b. What providers are included in the exchange?
 - c. What's the current scope of your exchange efforts (measured in transaction volume, type of data, etc.)?
 - d. Is there a governance structure for overseeing the initiative – who comprises that, is it a formal legal entity, does it set policy?
 - e. Do you have certain requirements (technological, financial, patient-based) that the entity must meet to participate (in your geographic market)?
 - f. What level of investment has your organization made to the effort?
 - g. Do the participating entities fund or pay a fee for the use of the data – if yes, ask them to elaborate on the model (transaction-based, etc.) and what's paid, etc.
 - h. Are you currently receiving state and/or federal funding in support of the initiative (AHRQ, RTI, Markle Foundation, etc.)?
 - i. Do you possess an inventory of the technology being deployed in support of the initiative that you would be willing to share (hardware, software, vendors, interfacing, network configuration, etc.)?
 - j. Do you employ metrics to judge the success of your data exchange efforts?
 - k. Would you be willing to share your business and strategic plans with MiHIN?
3. If no, are you planning to initiate data exchange within the next 12 months and if so, would you be willing to share your business and strategic plans with MiHIN? If a formal business plan does not yet exist, can we assist with providing you a template?

4. What other ways can MiHIN support your data exchange efforts – would you value a ‘tool kit’ which delineates the tasks and resources needed to begin a health information exchange effort? What else would be helpful to you at this time?
5. Do you agree that in the future it will be important for regional efforts around the state to exchange patient data between themselves?
6. If yes, would you support the development of standards/guidelines which provide minimal requirements for interoperability between regional efforts?
7. What role do you believe MiHIN should have as it relates to your data exchange initiative?
8. What key points would you like me to convey to those involved in the MiHIN effort?
9. Would you be willing to complete a more comprehensive survey regarding your initiative (leave-behind copy and provide link to complete on-line)
10. What is/was the principal driving force behind the formation of the RHIO/Regional HIE?
11. Who can we contact about legal issues? Technical issues? Clinical issues?

The following information is a catalog of interview summaries conducted in July 2006. The information was current as of that date and is not meant to be an up-to-date representation of these initiatives.

Interview Summaries

Capital Area RHIO Development Process managed by the Capital Area Health Alliance

In January 2005 Board of Directors of the Capital Area Health Alliance (CAHA) passed a resolution to create a digital health information strategy and system for the tri-county community of Clinton, Eaton, and Ingham Counties that would promote the secure exchange of clinical patient information across organizational boundaries. CAHA was a perfect vehicle for RHIO development because its member organizations were the stakeholders who would be needed to participate in the development project and contribute the time, personnel and finances to support the initiative.

The CAHA project named Capital Area RHIO Development Process is made up of representatives of physicians, and other health care professionals and leaders from:

- | | |
|--------------------------------------|---|
| • Blue Cross Blue Shield of Michigan | • Lansing Regional Chamber of Commerce |
| • Community Mental Health | • Michigan Department of Community Health |
| • Hayes Green Beach Hospital | • Michigan State University |
| • Ingham County Health Department | • Physicians Health Plan of Mid-Michigan |
| • Ingham County Medical Society | • Sparrow Health System |
| • Ingham Regional Medical Center | |

Work was done in early 2005 by the Steering Committee to develop a shared vision, goals and objectives and transfer those into tactics and a business plan defining needs and requirements for funding and sponsorship. The project was also designated as a Demonstration Project, working with the Institute for Health Care Studies at MSU to share project evaluation, health economic metrics, activities, findings and conclusions with other Michigan communities. Direct financial contributions for the project were made by Ingham Regional Medical Center, Michigan State University and Sparrow Health System.

A matching grant was received as Medicaid Matching funds through the Michigan Department of Community Health and in-kind contributions were received from the Ingham County Health Department and the Lansing Regional Chamber of Commerce. In addition, because the vision for the Capital Area RHIO always included using the RHIO to promote public health objectives for the Capital Area community, the project entered a competitive process and was awarded a significant grant from the Robert Wood Johnson Foundation to support plans to integrate public health capacity into RHIO development.

With oversight from the CAHA Board of Directors, work for the project was divided among five standing committees:

- Steering Committee
- Business Planning and Governance Committee
- Community Information Technology Assets and Source System Assessment
- Products and Services for Physicians and Providers
- Public Health Information Development

Those committees have been used to guide an assessment process which is currently underway and involves four surveys relating to: Clinical Service Provider Capacity, Physician Office Work Flow, Public Health Integration and HIE Readiness. Along with over 80 project participants, that assessment process includes expert consultants in RHIO Development, Organization Management, Strategic and Legal Planning, Health Information Technology and Finance. Several of the project participants are already exchanging some Health Information data electronically. Pilots and other demonstration options will be explored. It is expected that the project will finish a plan for implementation, incorporating findings and recommendations from the assessment process in 2007, at which time additional funding will be sought for implementation.

Statewide resources will be needed to engage large nationwide laboratories to participate in the exchange of information with regional HIEs. Additionally, consolidated legal resources should be made available to assist regional HIEs with their efforts. CA RHIO is actively involved in the MiHIN process and is willing to explore opportunities to participate in inter community information exchange and data standardization.

Greater Flint Health Coalition

The Greater Flint Health Coalition just recently identified that a Health Information Exchange could be beneficial. They are currently doing more research to understand what an HIE is and how they could benefit by developing an HIE.

Holland Regional Effort

The Holland Hospital is exchanging health care information today by making lab and x-ray information available to physicians in the community (there are approximately 170 physicians participating). Currently 40% of all the physicians in the community have implemented EMRs and another 40% are in the process of implementation. They have created an RFP for interconnectivity software. Holland will be soliciting funds from insurance companies and members of local businesses throughout the community for initial costs of establishing the Regional effort. A charter has been developed for the task force. The business plan for Holland is to be completed by the end of summer 2006. The subcommittee of the Hospital Board provides the main governance structure right now, but by next fall plan to become a formal legal entity. The Holland Regional effort stated that a statewide effort could help by (1) providing pool of subject matter experts that could be tapped into; (2) standards/guidelines for exchange of information between regional initiatives; (3) act as an umbrella to connect regional initiatives.

Michigan Health Infrastructure (MHI) – Grand Rapids area

The business plan for MHI was to be completed by early to mid July (2006). They will begin testing project pilots this fall. The leader in this initiative was Spectrum Health (which is not a formalized entity yet, but will proceed with forming a non-profit corporation after the pilot). The MHI currently has 12 private practice clinics (which include 100 physicians) that are using some component of health information exchange. A few examples are: labs, x-rays, allergy alerts, e-Prescribing and utilizing Cerner. They believed that a statewide effort could help by: (1) providing standards/guidelines for exchange of information between regional initiatives; (2) act as an umbrella to connect regional initiatives; (3) MiHIN could help by having the experts as resources already available; (4) give a regional initiative a “stamp” of legitimacy – recognition at the state level.

Michigan Health Information Alliance (MHIA) – Central Michigan

The Michigan Health Information Alliance is reported to be in the planning stage. They stated that they are about two years away from exchanging information electronically. The geography of MHIA is not yet defined, but they plan to cover most of Central and Northern Michigan. Central Michigan University has offered to be an organizing neutral third party. They believe a statewide effort could help by: (1) producing a toolkit and a business plan; (2) endorsing National Standards that regional initiatives should use; (3) providing recommendations on key legal issues relevant to data sharing; (4) offering consulting services for legal, technical and governance issues; (5) providing access to funding for rural and impoverished areas so they can actively participate; (6) decentralizing regional initiative network.

Michigan Upper Peninsula Health Information Technology Network (Michigan UP HIT Network)

The Michigan Upper Peninsula Health Information Technology Network was formed in 2005 to “improve patient safety and quality of care through the regional planning, development, and implementation of Health Information Technologies.” This HIT network includes Marquette General Hospital (MGH) and ten Critical Access Hospitals located across Michigan’s Upper Peninsula. The Network was organized within the existing Upper Peninsula Health Care Network, which has coordinated shared services among its members for the past 10 years.

The Network is using an existing web-based, portal/repository application (UPCare) that allows selected clinical information to be accessed by authorized physicians and other health care providers for patient care delivery and quality reporting. UPCare was created by MGH in 2001 to provide health professionals web-access to their patients’ clinical information. The system currently provides approximately 4,000 health professionals with web-access to the clinical records of nearly 400,000 patients across the Upper Peninsula. The Network is using a three-year AHRQ grant to connect the ten Critical Access Hospitals to the existing Network over the next two years.

Network HIT applications include: (a) HIT systems at each partner hospital that capture and send patient demographic and clinical data to the regional data repository; (b) a regional HIT master patient index/unique patient identifier; (c) a regional HIT interface engine to accept and reformat incoming data from the Partner HIT systems; (d) a regional HIT clinical data repository that contains a consolidated summary of patient information; and (e) a web-based portal viewer allowing clinical information to be accessed by providers.

SE Michigan HIE

Southeast Michigan Health Information Exchange (SE MI-HIE) project was initiated in March 2006 with participation by health care stakeholders (health systems, physician groups, medical societies, insurance plans, employers, and others) in the seven-county Metro Detroit area. The counties were determined by the location of employees and the location of key health systems/hospitals in area.

The initiative is in the planning stage and the scope of exchange efforts and governance structures were to be defined by the end of July 2006. Compuware/Covisint is funding the first two years of build out and is bringing the core technology to the SE Michigan effort.

Thumb Rural Health Network

The Thumb Rural Health Network (TRHN) is a 15-member organization located in the rural counties of Huron, Sanilac and Tuscola, typically referred to as Michigan’s “Thumb”. TRHN’s membership consists of all hospitals located in the three counties, and includes seven Critical Access Hospitals and one sole-provider; all three County Health Departments; three tertiary hospitals serving the region; and one Multipurpose Collaborating Council. In 2006, the organization identified the need to develop a Health Network Exchange (HNE) and has initiated a formal planning process. The Network is currently

developing its HNE vision and priorities, and is conducting an inventory of HNE resources, capabilities and member HNE priorities. The Network's HNE Development plan is scheduled for completion by the fall of 2006.

APPENDIX F: OVERVIEW OF MICHIGAN’S LEGAL FRAMEWORK FOR HEALTH DATA RELEASE / SHARING

The following is a compilation of references to the various relevant Michigan Court Rules, Statutes, Administrative Rules, Advisory Opinions and Case law that have bearing on Health Data release and sharing. This compilation was created in order to facilitate research and compliance with Michigan law.

Michigan Court Rules	Reference	Summary / Title
	MCR 2.314	Release of Medical Information by Subpoena
	MCR 2.506	Compliance with Subpoena by Hospitals

Statutes of Michigan		
Freedom of Information Act	MCL 15.243	Items Exempt from Disclosure Under FOIA
Uniform Crime Reporting System Act	MCL 28.258	Information for LEIN
	MCL 52.205	Coroners and Medical Examiners
Michigan Vehicle Code	MCL 257.625a	Driving While Intoxicated
Aeronautics Code	MCL 259.187	Flying Aircraft While Intoxicated
Natural Resources And Environmental Protection Act	MCL 324.80182	Marine Safety
	MCL 324.81136	Off-road Vehicles
	MCL 324.82138	Snowmobiles
Critical Health Problems Reporting Act	MCL 325.75	Critical Health Data Reporting
Mental Health Code	MCL 330.1143a.	Confidentiality of Peer Review Information for Psychiatric Facilities
	MCL 330.1244	Collection of Information by MDCH
	MCL 330.1435	Civil Admission and Discharge for Mental Illness
	MCL 330.1498i	Notification to Parent or Guardian of Hospital Admission of Minor
	MCL 330.1707	Parent or Guardian Not to be Notified of Mental Health Services Provided to Minor
	MCL 330.1723	Obligation of Mental Health Professional to Report Abuse or Neglect
	MCL 330.1726	Rights of Residents of Mental Health Facilities to Unimpeded Communication
	MCL 330.1746	Maintenance of Records for Mental Health Services
	MCL 330.1748	Confidentiality of Mental Health Records
	MCL 330.1748a	Use of Mental Health Records as Evidence of Abuse or Neglect
	MCL 330.1750	Privileged Communications as Evidence
	MCL 330.1920	Interstate Compact on Mental Health
	MCL 330.1946	Duty of Mental Health Professional to

Statutes of Michigan		
		Warn

Statutes of Michigan		
Release Of Information For Medical Research And Education Act	MCL 331.531	Disclosures to Peer Review Entities
	MCL 331.533	Confidentiality of Information Utilized by Peer Review Entity
The Public Health Code	MCL 333.2221	Public Health Programs
	MCL 333.2611	MDCH's Confidentiality Policies
	MCL 333.2619	Establishment of Cancer Registry
	MCL 333.2631	Reporting or Sharing Research Information with MDCH
	MCL 333.2632	Confidentiality of Information Obtained During Research
	MCL 333.2633	Provider Liability for Disclosures to MDCH
	MCL 333.2637	MDCH Confidentiality Procedures
	MCL 333.2640	Provision of Medical Records for Child Abuse or Neglect
	MCL 333.2821	Vital Records
	MCL 333.2834	Fetal Death
	MCL 333.2835	Abortion Reporting
	MCL 333.2837	Abortion-Related Deaths or Complications
	MCL 333.2843b	Infectious Agents in Deceased Persons
	MCL 333.2844a	Release of Information to Find Missing Persons
	MCL 333.2888	Inspection and Disclosure of Vital Records
	MCL 333.5111	Prevention and Control of Disease
	MCL 333.5114	Reporting HIV Test Results
	MCL 333.5114a	Partner Notification of HIV Test Results
	MCL 333.5119	HIV Tests for Marriage Licenses
	MCL 333.5123	VD, HIV or Hepatitis B Tests for Pregnant Women
	MCL 333.5127	Consent by Minor for VD or HIV Testing
	MCL 333.5129	Communicable Disease Test Results of Prostitutes and Intravenous Drug Users
	MCL 333.5131	Confidentiality of HIV or AIDS Test Results
	MCL 333.5133	Consent Forms for HIV and AIDS Testing
	MCL 333.5611	Occupational Diseases
	MCL 333.5613	Diagnosis and Treatment of Occupational Disease
	MCL 333.5703	Toxicological Studies of Vietnam Veterans

Statutes of Michigan		
Public Health, continued	MCL 333.5715	Confidentiality of Chemical Herbicide Exposure
	MCL 333.5721	Reporting Birth Defects
	MCL 333.5874	Records of Crippled Children
	MCL 333.6111	Records of Substance Abuse Treatment
	MCL 333.6112	Permitted Disclosures of Substance Abuse Records
	MCL 333.6113	Additional Disclosures of Substance Abuse Records
	MCL 333.6121	Validity of Minor Consent to Substance Abuse Treatment
	MCL 333.6521	Confidentiality of Substance Abuse Records
	MCL 333.7334	Required Forms for Prescribing Controlled Substances
	MCL 333.7335	Marijuana Research Studies
	MCL 333.7516	Practitioner Duty to Maintain Confidentiality of Patient Information
	MCL 333.7544	Power of MBP to Authorize Research
	MCL 333.9132	Minor's Capacity to Consent to Treatment
	MCL 333.9206	Immunizations
	MCL 333.9207	Childhood Immunization Registry
	MCL 333.9307	Hearing and Vision Testing for School Registration
	MCL 333.10102	Organ Donation
	MCL 333.11101	Blood Bank
	MCL 333.16168	MDCIS to Retain Consultant
	MCL 333.16169	Health Professional Recovery Committee Personnel Duty to Report
	MCL 333.16170a	Impaired Health Professionals
	MCL 333.16211	Licensee Records
	MCL 333.16221	Licensee Investigations and Grounds for Disciplinary Action
	MCL 333.16222	Licensee or Registrant Duty to Report Violations
	MCL 333.16223	Licensee or Registrant Duty to Report Impairment
	MCL 333.16236	Examination Required for Disciplinary Investigations
	MCL 333.16238	Confidentiality of Information Obtained in a Disciplinary Action
	MCL 333.16243	Disclosure to MDCIS for Disciplinary Investigation
	MCL 333.16244	Waiver of Privilege for Disciplinary Actions

Statutes of Michigan		
Public Health, continued	MCL 333.16267	Obligation to Report Positive HIV Test Results
	MCL 333.16281	Disclosure of Child Abuse Investigation Records
	MCL 333.16644	Retention of Dental Records
	MCL 333.16645	Patient Identification on Orthodontic Devices and Dentures
	MCL 333.16648	Confidentiality of Dental Records
	MCL 333.16911	Family and Marriage Therapy Privileged Information
	MCL 333.17015	Informed Consent for Abortion
	MCL 333.17020 and 333.17520	Consent to Genetic Testing
	MCL 333.17078	Physician Assistant Privilege
	MCL 333.17752	Prescription Drug Records
	MCL 333.18117	Confidentiality of Counselor Communications
	MCL 333.18237	Privileged Disclosures to Psychologists
	MCL 333.18513	Confidentiality of Communications to Social Workers
	MCL 333.20155	Facility Accreditation and Audits
	MCL 333.20175	Patient Records
	MCL 333.20191	Infectious Agent and Emergency Treatment
	MCL 333.20201	Policies Regarding Patient Rights and Responsibilities in Facilities and Agencies
	MCL 333.20821	Requirements for Freestanding Surgical Outpatient Facility
	MCL 333.21515	Confidentiality of Hospital Peer Review Records
	MCL 333.21743	Confidentiality of Clinical Records by MDCIS, MDCH and Nursing Homes
	MCL 333.21763	Confidentiality of Communications by Nursing Home Residents
	MCL 333.21771	Mistreatment of Patients
	MCL 333.22210	Privacy Policy for Short Term Facilities
Medical Records Access Act	MCL 333.26261	Provides for Review of Access to medical Records
Social Welfare Act	MCL 400.11a	Reporting of Suspected Abuse of Adults
	MCL 400.11c	Confidentiality of Identity of Reporter
	MCL 400.64	Public Assistance Records
	MCL 400.111b	Requirements for Providers Participating in Medical Assistance Programs
Michigan Children's Institute Act	MCL 400.211	Michigan Children's Institute

Statutes of Michigan		
Adult Foster Care Licensing Act	MCL 400.712	Adult Foster Care
OSHA	MCL 408.1024	Occupational Health Standards
Worker's Disability Comp. Act	MCL 418.230	Worker's Compensation Records
	MCL 418.315	BWC's Right to Review Medical Records and Invoices
Bullard - Plawecki Right to Know Act	MCL 423.501	Bullard- Plawecki
Identity Theft Protection Act	MCL 445.61 <i>et seq.</i>	Misuse, Theft of Medical Records and Information
Uniform Electronic Transactions Act	MCL 450.831 <i>et seq.</i>	Terms and Conditions for Using Electronic Signatures and Information of Business Transactions
Insurance Code	MCL 500.115, 500.501 – .547 and 500.2013	Gramm-Leach- Bliley
	MCL 500.3407b	Nondiscrimination Based on Genetic Information
	MCL 500.3523(3)(i)	HMO Contracts
	MCL 500.8106	Insolvent Insurer Cooperation with OFIS
	MCL 500.8111	Insolvency and Liquidation of Insurers
General Insurance Law, Viatical Settlement Contracts	MCL 550.524	Viatical Settlement Contracts
3rd Party Administrator Act	MCL 550.934	Confidentiality Obligations of TPAs
Non Profit Health Care Corporation Reform Act	MCL 550.1401(3)(e)	Nondisclosure of Genetic Information
	MCL 550.1406	Duty to Maintain Confidentiality and Security of Members' Health Information
	MCL 550.1407	Complaint System
	MCL 550.1604	Confidentiality of Records/Medical Care and Hospital Services
Patient's Right to Independent Review Act	MCL 550.1907	Right to Internal Grievance and External Review Procedures
	MCL 550.1911	External Review Process
	MCL 550.1919	Standards for Independent Review Organization
Revised Judicature Act of 1961	MCL 600.2157	Waiver of Physician/Patient Privilege
	MCL 600.2912b	Notice of Medical Malpractice Action Against Health Care Provider
	MCL 600.2912f	Waiver of Privileges After Filing Medical Malpractice Claims
	MCL 600.2912g	Disclosure of Medical Records for Arbitration
MI Probate Code	MCL 710.68	Release of Information to Adopted Children and Adoptive Parents
	MCL 712A.13a	Release of Medical and Education Reports to Foster Parents
Child Custody Act	MCL 722.30	Parents' Right to Records and Information

Statutes of Michigan		
Child Protection Act	MCL 722.623	Reporting Child Abuse
	MCL 722.623a	Reporting of Child Abuse Involving Alcohol or Controlled Substances
	MCL 722.625	Protection of the Identity of Person Reporting Child Abuse
	MCL 722.626	Detention of Abused or Neglected Child by Hospital
	MCL 722.627	FIA Central Registry and Release, Amendment and Expunction of Central Registry Records
Foster Care and Adoption Services Act	MCL 722.904	Judicial Waiver of Parental Consent
	MCL 722.954	Foster Child's Confidential Information
	MCL 722.95	Medical Records for Child Placed in Foster Care
Penal Code	MCL 750.410	Prohibited Sale of Medical Records
	MCL 750.411	Injury Reporting
	MCL 750.492a	Deliberate Falsification of Medical Records
Code of Criminal Procedure	MCL 767.5a	Confidentiality of Physician/Patient Communication
Department of Corrections Act	MCL 791.267	Testing of Prisoners for HIV
	MCL 791.267b	Right of Prison Employees to Have Prisoners Tested
Social Security Number Privacy Act	MCL 445.81	Changes SSN to Private Number – Disallows use as Main Identifier
Medical Emergencies in Health Clubs	MCL 333.26311	Changes duties of health Clubs in Emergencies
Proposed Changes		
E-Prescribing – Non-Controlled Drugs	ADMIN CODE R.338.471	
E-Prescribing – Non-Controlled and Controlled Drugs	HB 6323	
Medical Records Maintenance Changes	SB 465	
Disposal Of Medical Records / Maintenance	SB 466	
Disclosure Of Genetic Information	SB 467	
PHI Exempt From FOIA Disclosure	SB 468	

Attorney General Opinions		
	Opinion No. 7092 (October 16, 2001)	Disclosure of Minor's Mental Health Records to Noncustodial Parent
	Opinion No. 6819 (September 28, 1994)	Changes to Medical Record
	Opinion No. 6764 (August 11, 1993).	Nondisclosure of Mental Health Information
	Opinion No. 6660 (September 12, 1990)	Records of Stillbirths and Fetal Deaths
	Opinion No. 6593 (July 12, 1989)	Access by Worker's Compensation or Insurance Representative
	Opinion No. 6439 (May 29, 1987)	Disclosure of Medical Records to FIA to Substantiate Payments to Providers
	Opinion No. 6376 (June 30, 1986)	Examining Records of Deceased Persons
	Opinion No. 6369 (June 9, 1986)	Rights of Next of Kin Regarding Organ Donations
	Opinion No. 6270 (January 31, 1985)	Access to Work- Related Medical Records Maintained by Employer
	Opinion No. 5709 (May 20, 1980)	County Mental Health Board and Recipient Mental Health Records
	Opinion No. 5446 (February 23, 1979)	Hospital Release of Child's Medical Records to Attorney Representing Child
	Opinion No. 5420 (December 22, 1978)	Parent or Guardian Not Required to Give Consent
	Opinion No. 5406 (December 15, 1978)	FIA Access to Child's Medical Records
	Opinion No. 5125 (May 30, 1978)	Ownership and Access to Medical Records
	Opinion No. 2994 (January 16, 1945)	Disclosure of Patient's Admissions

Michigan Administrative Code Rules		
Child Immunization Registry	Rule 325.162	Access to Childhood Immunization Registry
	Rule 325.163	Reporting Immunization Data to MDCH
	Rule 325.164	Release of Medical Records to MDCH for Review
	Rule 325.165	Right to Amend MCIR
	Rule 325.166	Confidentiality and Release of MCIR Immunization Data
Communicable and Related Diseases	Rule 325.173	Reporting of Diseases and Infections
	Rule 325.181	Confidentiality of Reports
Cancer Reporting	Rule 325.971	Reporting of Cancer Cases
Minimum Standards of Hospitals	Rule 325.1028	Hospital Medical Record Requirements
PKU Test on Newborn Infants	Rules 325.1473 and 325.1475	Laboratory Reports
Homes for the Aged	Rule 325.1851	Records of Homes for the Aged
	Rule 325.1853	Content of Homes for the Aged Records
Vital Records	Rule 325.3203	Confidentiality of Vital Records Collected by State Registrar
	Rule 325.3233	Listing of Marriages, Divorces and Deaths by Registrar
	Rule 325.3234	Inspection of Vital Records Maintained by Registrar
	Rule 325.3235	Security of Records Maintained by Registrar
Employee Medical Records and Trade Secrets	Rules 325.3451-325.3476	Maintenance and Access to Hazardous Exposure Records Maintained by Employers
Freestanding Surgical Outpatient Facilities	Rule 325.3828	Informed Consent
	Rule 325.3831	Records to be Maintained
	Rule 325.3847	Maintenance of Medical Records by Freestanding Surgical Outpatient Facilities
	Rule 325.3848	Protection of Medical Records
Health Maintenance Organizations	Rule 325.6405	HMO Contracts
	Rule 325.6805	HMO Patient Records
	Rule 325.6810	Confidentiality of HMO Clinical Patient Records
Cancer Reporting	Rule 325.9053	Information for Cancer Reporting
	Rule 325.9054	Confidentiality of Cancer Reports
	Rule 325.9055	Release of Cancer Registry Information
	Rule 325.9056	MDCH Sharing of Cancer Statistics with Other State and Federal Agencies
Spinal cord and Traumatic Brain Injury Reporting	Rule 325.9063	Reporting Spinal Cord and Traumatic Brain Injuries
	Rule 325.9064	Confidentiality of Registry Reports

Michigan Administrative Code Rules		
	Rule 325.9065	Release for Research
	Rule 325.9066	Reports to Spinal Cord and Brain Injury Registry
Birth Defects Reporting	Rule 325.9072	Reportable Birth Defects
	Rule 325.9073	MDCH Access to Medical Records
	Rule 325.9074	Birth Defect Reports
	Rule 325.9075	Release for Research
Blood Lead Analysis Reporting	Rule 325.9085	Right to Inspect Medical Records
	Rule 325.9086	Confidentiality of Blood Lead Testing Reports
Hospice Care	Rule 325.13109	Hospice Care
	Rule 325.13205	MDCIS Licensure Surveys of Hospices
	Rule 325.13213	Inspection of Licensure Records for Hospice Care Facilities
Licensure of Substance Abuse Treatment and mental Health and Substance Abuse Services	Rule 325.14205	Licensing for Substance Abuse Treatment Programs
	Rule 325.14304	Substance Abuse Treatment Program Patient's Right to Review Records
	Rule 325.14910	Content and Maintenance of Patient Records for Substance Abuse Treatment Programs
Nursing Homes and Nursing Care Facilities	Rule 325.20112	Nursing Homes' Policies for Access to Records
	Rule 325.20215	Nursing Home Licensure Records
	Rule 325.20404	Life-Threatening Accident or Injuries in Nursing Home
	Rule 325.21101	Disclosure of Nursing Home Patient Records to MDCIS
	Rule 325.21203	Medical Audits by Nursing Homes
	Rule 325.21411	Transfer Agreements Between Child Care Home and Hospital Pediatric Department
OHS for Haz. Waste Operations and Emergency Response	Rules 325.51474, 325.51881 and 325.77111	Recordkeeping Requirements for Certain Occupational Health Exposures
	Rule 325.52115	Physician's Written Opinion Regarding Employee
	Rule 325.52116	Employer Retention of Medical Records
Bloodborne Infectious Disease Standard	Rule 325.70013	Records of Vaccination and Post Exposure Follow-up
	Rule 325.70015	Employer's Duties as to Medical Records
Hazardous Work in Laboratories	Rule 325.70108	Medical Examination Records for Lab Accidents
	Rule 325.70111	Employer to Maintain Exposure and Exposure-Related Medical Records

Michigan Administrative Code Rules		
Licensing of Facilities	Rule 330.1239	Construction Requirements of Psychiatric Nursing Units
	Rule 330.1252	Public Inspection of MDCIS Records
	Rule 330.1276	Hospitals to Maintain Patient Records
Rights of Recipients	Rule 330.7051	Disclosures Regarding Mental Health Proceedings
Medical Services Administration Provider Hearings	Rule 400.3421	Medicare Provider Reviews
Adult Foster Care	Rules 400.14316 and 400.15316	Maintenance of Resident Records by Adult Foster Care Group Homes
Worker's Compensation Health Care Services	Rule 418.101402	Access by BWC

Michigan Case Law		
	Baker v. Oakwood Hospital Corporation, 239 Mich. App. 461 (2000).	Physician/Patient Privilege
	Dorris v. Detroit Osteopathic Hospital, 460 Mich. 26 (1999).	Physician/Patient Privilege
	People v. Sullivan, 231 Mich. App. 510 (1998).	Physician/Patient Privilege
	Oakland County Prosecutor v. Department of Corrections, 222 Mich. App. 654 (1997).	Physician/Patient Privilege and FOIA
	Landelius, et. al., v. Rafko, 433 Mich. 470 (1996).	Physician/Patient Privilege
	Doe v. Mills, et. al., 212 Mich. App. 73 (1995) .	Physician/Patient Privilege
	People v. Keskimaki, 446 Mich. 240, 521 N.W. 2d 241 (1994) .	Accident Exception to the Physician/Patient Privilege
	Densmore v. Department of Corrections, 203 Mich. App. 363, 512 N.W. 2d 72 (1994) .	Multiple FOIA Requests for Confidential Health Information
	Scott v. Henry Ford Hospital, 199 Mich. App. 241, 501 N.W. 2d 259 (1993) .	Disclosure to Personal Representative Regarding of Deceased
	People v. Sayles, 200 Mich. App. 594 (1993).	Physician/Patient Privilege in Subsequent Trial
	Swickard v. Wayne County Medical Examiner, 438 Mich. 536, 475 N.W. 2d 304 (1991) .	Physician/Patient Privilege and Autopsies
	Domako v. Rowe, 438 Mich. 347, 475 N.W. 2d 30 (1991) .	Waiver of Physician/Patient Privilege
	Navarre v. Navarre, 191 Mich. App. 395 (1991) .	Waiver of Physician/Patient Privilege in Child Custody
	People v. Perlos, 436 Mich. 305 (1990) .	Disclosure of Blood Samples for Criminal Prosecution
	Estate of Green v. St. Clair County Road Commission, 175 Mich. App. 478 (1989) .	Admissibility of a Decedent's Blood Alcohol Level in Civil Action
	Popp v. Crittenton Hospital, 181 Mich. App. 662 (1989) .	Release of Nonparty Medical Records
	Saldana v. Kelsey-Hayes Company, 178 Mich. App. 230 .	Invasion of Privacy
	VanSickle v. McHugh, 171 Mich. App. 622 (1988) .	Scope of Physician/Patient Privilege
	Dierickx v. Cottage Hospital Corporation, 152 Mich.	Discovery of Nonparty

	App. 162 (1986).	Medical Records
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Michigan Case Law		
	People v. Johnson, 181 Mich. App. 662 (1981) .	Release of Nonparty Medical Records
	Drouillard v. Metropolitan Life Insurance Company, 107 Mich. App. 608 (1981).	Waiver of Physician/Patient Privilege by Personal Representative
	Cartwright v. Maccabees Mutual Life Insurance Company, 65 Mich. App. 670 (1976).	Release of Physician's Oral Report to Insurance Agency
	Gaertner v. State of Michigan, 385 Mich. 49 (1971) .	Legal Representative's Access to Incompetent Minor's Medical Records
	Orlich v. Buxton, 22 Mich. App. 96, 177 N.W. 2d 184 (1970) .	Scope of Physician/Patient Privilege
	Franklin Life Ins. Co. v. William J. Champion & Co., 353 F. 2d 919 (6th Cir. 1965) .	Scope of Physician/Patient Privilege
	Polish Roman Catholic Union of America v. Palen, 302 Mich. 557, 5 N.W. 2d 463 (1942) .	Physician/Patient Privilege
	Basil v. Ford Motor Co., 278 Mich. 173, 270 N.W. 258 (1936).	Scope of Physician/Patient Privilege

APPENDIX G: SECURITY STANDARDS MATRIX

This matrix was included as an appendix to the federal security regulations and can be found at 68 Federal Register 8380 (February 20, 2003).

Standards Sections Implementation Specifications (R)=Required, (A)=Addressable

Administrative Safeguards

Security Management Process.....	164.308(a)(1)	Risk Analysis (R) Risk Management (R) Sanction Policy (R) Information System Activity Review (R)
Assigned Security Responsibility.....	164.308(a)(2)	(R)
Workforce Security.....	164.308(a)(3)	Authorization and/or Supervision (A) Workforce Clearance Procedure Termination Procedures (A)
Information Access Management	164.308(a)(4)	Isolating Health care Clearinghouse Function (R) Access Authorization (A) Access Establishment and Modification (A)
Security Awareness and Training.....	164.308(a)(5)	Security Reminders (A) Protection from Malicious Software (A) Log-in Monitoring (A) Password Management (A)
Security Incident Procedures.....	164.308(a)(6)	Response and Reporting (R)
Contingency Plan.....	164.308(a)(7)	Data Backup Plan (R) Disaster Recovery Plan (R) Emergency Mode Operation Plan (R) Testing and Revision Procedure (A) Applications and Data Criticality Analysis (A)
Evaluation	164.308(a)(8)	(R)
Business Associate Contracts and... Other Arrangement	164.308(b)(1)	Written Contract or Other Arrangement (R)

Physical Safeguards

Facility Access Controls.....	164.310(a)(1)	Contingency Operations (A) Facility Security Plan (A) Access Control and Validation Procedures (A) Maintenance Records (A)
Workstation Use.....	164.310(b)	(R)
Workstation Security.....	164.310(c)	(R)

Device and Media Controls164.310(d)(1) Disposal (R)
Media Re-use (R)
Accountability (A)
Data Backup and Storage (A)

Technical Safeguards (see §164.312)

Access Control164.312(a)(1) Unique User Identification (R)
Emergency Access Procedure (R)
Automatic Logoff (A)
Encryption and Decryption (A)
Audit Controls164.312(b) (R)
Integrity164.312(c)(1) Mechanism to Authenticate Electronic Protected
Health Information (A)
Person or Entity Authentication.....164.312(d) (R)
Transmission Security.....164.312(e)(1) Integrity Controls (A)
Encryption (A)

Added Notes:

If an implementation specification is “required”, the covered entity must implement policies and/or procedures that meet what the implementation specification requires.

If an implementation specification is “addressable”, the covered entity must assess whether it is a reasonable and appropriate safeguard in the entity’s environment. This involves analyzing the specification in reference to the likelihood of protecting the entity’s electronic protected health information from reasonably anticipated threats and hazards. If the covered entity chooses not to implement an addressable specification based on its assessment, it must document the reason and, if reasonable and appropriate, implement an alternative measure.

APPENDIX H: TECHNOLOGY OVERVIEW

This appendix provides the highlights of technology activities, conclusions and recommendations. The anticipated processes for both implementing individual HIEs and moving toward a network of HIEs and a National Health Information Network (NHIN) are expected to be incremental and iterative. This in part derives from two aspects of the role of technology in HIEs and HIT, (1) the closely intertwined relationship between policy and technical decisions, and (2) the emerging and changing nature of many HIT solutions. Thus, technology issues need to be revisited in tandem with policy decisions and direction as HIE activity develops and expands and as its associated, supportive technologies become more widespread and increase in sophistication.

Policy/Technology Symbiosis: As stated in the eHealth Initiative's Connecting Communities Toolkit: "Although actual technical implementation of the HIE system is one of the last stages to be undertaken – the one where the 'rubber meets the road' – the decisions about which standards to use and which technologies to implement should be made early, as there are significant interactions between policy decisions (about privacy protection, for example) and the technical decisions (use of a record locator service to index distributed databases, for example). Experience has shown that this feedback into the policy process is critical and may, in fact, require re-examination of previously decided policy or technical issues."

HIE and HIT Technology Maturity Levels: Many business process, design and technology issues still need to be resolved, and much of the technology is still emerging and maturing. For example, Gartner views RHIOs and HIEs to be an emerging business and technology solution model, some five to ten years away from providing fully mature benefits. The user advice in "Hype Cycle for Health Care Provider Technologies, 2006", July 3, 2006, is to "think long-term of a networking infrastructure and business models that support many different needs for information exchange; act short-term to begin with a few kinds of information exchange that motivate physician participation and generate cost savings that lead stakeholders to accept long-term financial participation in the networks."

The *Conduit to Care*, including the materials in this appendix, resources on the MiHIN website and the foundation laid by efforts such as the Connecting for Health Common Framework (<http://www.connectingforhealth.org/commonframework>), and the eHealth Initiative's (eHI) Connecting Communities Toolkit (<http://toolkit.ehealthinitiative.org>) can assist in taking the next steps crucial to establishing functioning HIEs. The Common Framework is a methodology and implementation guide supporting the technical aspects of HIE and addressing issues such as patient and provider authentication, a record locator service, and effective technical architectures to support responsible implementation and access. It also includes policy guides and model contractual language. The Connecting Communities Toolkit supports learning across and among diverse stakeholders including state, regional, and community-based organizations. The Toolkit is a distillation of the knowledge that eHI has accumulated through its work with multiple stakeholders and various communities.

I. Technical Overview

A. Issue and Challenge Highlights

Technology issues and pending tasks were identified by a number of workgroups. These are described in greater detail in both this appendix and the *Conduit to Care* report.

- Developing and assuring adherence to a common set of principles and standards both for the technical and policy aspects of information sharing, addressing the needs of every stakeholder.
- Achieving a viable, equitable, trust-based balance between centralized/federated HIE models.
- Establishing standards and architecture, compatible with other HIEs and national standards in order to facilitate interoperability.
- Ensuring privacy, security and disaster recovery capabilities.
- Creating a shared methodology and standards for identity, authentication and authority (including encryption, certificate exchange, auditing and logging).
- Select or develop shared provider and patient indexes, and controlled medical vocabulary, terminology and coding standards.
- Achieving a workable balance between computer-processable and computer manageable data standards.
- Developing consistent frameworks for presenting information related to the technical aspects of HIEs.
- Ensuring sufficiently robust infrastructure to support migration to an interoperable, scalable health information network.

Health Information Exchange Characteristics

- Includes multiple senders and receivers of data (many-to-many relationships)
- Multiple beneficiaries and value propositions
- Shared infrastructure
- Public-private partnership
- Typically no participant can meet needs independently

HIEs typically focus on improving cross-organizational communications and access to patient information, including:

- Delivery of results and reports
- Ambulatory orders from physician practices (including e-Prescribing)
- Referrals and consults
- Secure messaging
- Historical patient record access

Health Information Technology Characteristics

- Typically defined, designed and implemented to serve the needs of an entity or organization
- Usually serves the organization and its customers
- Benefit, decision and funding relates to one specific organization

Examples of HIT Products and Services include:

- Physician practice EMR system
- Practice management system
- Laboratory system
- Hospital CPOE
- Medical Records system

B. Review Selected Clinical Data Sharing HIE Architecture Options

Health information Exchange (HIE) Architectures

The Technology Workgroup reviewed basic HIE architecture options and their implications. A detailed presentation to the workgroup by Shaun Grannis (MD, MS) from the Regenstrief Institute is available at the MiHIN site - see

<http://workspace.ehealthinitiative.org/medigent/collaborate/view.aspx?CID=426&AID=609&AT=documents>

The review illustrates the issues surrounding the centralization/decentralization debate, and the need to address issues such as trust, ownership and control. According to Gartner's "U.S. RHIO's" A Hype Roller Coaster", April 27, 2006, the federated or confederated model is an important compromise. The Indiana Health Information Exchange is currently the best example of the federated model.

Primary Models Reviewed

- **Fully integrated, monolithic database:** All data reside in a single data base structure, and users interact with centrally located, standardized content. An example is the planned UK PHS.
- **Federated, inconsistent databases:** Data is gathered from physically separate repositories with different patient identifiers, different data models and different identifiers for observations (e.g. hemoglobin, Hgb or WB Hemoglobin). An example is the CareSciences/Santa Barbara County Care Data Exchange.
- **Federated, consistent database:** Data is gathered centrally in separate physical files, "mirrors" of remote sites. Data is standardized at the time it comes in. An example is the Regenstrief/Indiana Network for Patient Care.

- **Patient carried/owned patient centric-smart cards/PING:** A standardized data set is carried by each individual. Infrastructure at clinical sites interacts with the data.
- **Switch:** No data storage. Data is gathered centrally in separate physical files, “mirrors” of remote sites. Data is standardized at the time it comes in.

Advantages and Disadvantages

Centralized Database

- **Advantages**
 - Simplicity
 - Benefits of scale
 - Data are consistent
 - Efficient
 - No patient linkage issues – everyone has to accept the same identifier
- **Disadvantages**
 - Doesn't scale well
 - Single point of control – must trust the custodian
 - Requires exceptional leadership
 - Everyone has to accept the same identifier
 - Needs robust communication infrastructure (e.g. Internet/fixed lines)

Federated Data Base

- **Advantages**
 - Data ownership can be managed by defining business policies and access rules
 - Individual organizations are able to control their own data
 - Benefits of scale
 - Builds on existing infrastructure – doesn't necessarily require new computers, easier transition
 - More opportunities for creativity (within the specified architecture)
 - Experience: The only examples of working interoperable healthcare systems use the federated model
- **Disadvantages**
 - Requires more coordination
 - May be slower than monolithic database
 - Have to solve the patient identifier problem
 - Also needs robust communication infrastructure in place
- **Other issues**
 - Consistent federated databases are a cross between inconsistent federated databases and centralized databases
 - If inconsistent federated databases are adopted, speed becomes a bigger issue
 - Patient linkage is a problem unless there is a uniform identifier but "incorrect" linkages are more easily undone than with centralized databases

C. Assess Regional HIE Core Requirements and Use Cases

Core HIE Requirements: Core requirements consist of a master patient index, vocabulary standardization and a provider index. The data repository contains clinical data that may be standardized or non-standardized. Repositories may represent hospitals, regional labs, or other data submitters.

- **Master Patient Index:** Used to identify where patient data resides within the HIE and to link specific data to specific patients. This is needed to aggregate patient data. Term is often used interchangeably with “Record Locator Service”.
- **Vocabulary Standardization:** Functionality needed to create a common vocabulary (for diseases, diagnoses, lab findings, etc.) by translating differing proprietary vocabularies into a single common vocabulary. This is necessary for decision support and aggregating patient-level data by data type (a very useful clinical function).
- **Provider Index:** Used to identify doctors and other health care providers and their physical locations. Necessary for clinical results delivery.

Selected Use Cases: The work group delineated the data repository, master patient index, vocabulary standardization and provider index requirements for various scenarios or user cases. Use cases included:

- Delivering regional laboratory results to a HIE
- Transfer of clinical patient summaries between regional HIEs (Two scenarios, different assumptions about architecture and HIT)
- Transfer of medication history from payor and pharmacy benefits manager (PBM) sources to an Emergency Department (ED)
- Transfer of Medicaid data to an ED

Depending on the type of information exchange desired, the technology needed to transfer or “switch” data among the HIEs varied as did the assumptions or requirements for the architecture. The “Regional Health Information Exchange (HIE) Schematic with Core Components” is available at

<http://workspace.ehealthinitiative.org/medigent/collaborate/view.aspx?CID=478&AID=766&AT=documents>

Research and Advisory Service Perspective and Validation: Gartner's "Hype Cycle for Healthcare Provider Technologies, 2006", July 3, 2006, characterizes the core technologies as either being in or entering the mature mainstream. "Any Care Delivery Organization (CDO) that does not have a monolithic computing environment should use the capabilities of an enterprise master person index to ensure that it is able to accurately aggregate all patient information across all of its internal information systems. This capability will also be critical as CDOs begin to participate in information sharing outside the organization, such as regional health information organizations (RHIOs). Access to adequately controlled medical vocabulary (CMV) capabilities is becoming essential to healthcare providers to offer automated support for advanced healthcare activities such as clinical decision support, outcomes analysis, care management protocols and evidence-based medicine."

APPENDIX I: MIHIN RESOURCE CENTER WORKGROUPS

The structure for the MiHIN Resource Center Workgroups is similar to the *Conduit to Care* structure, however, additional objectives have been added to each workgroup. The objectives and type of participants of each workgroup are as follows:

Clinical Workgroup

- Aid in the prioritization of key process flows under consideration by the MiHIN Resource Center for implementation
- Define and prioritize use cases that are appropriate
- Provide guidance on appropriate and most effective use of HIE in clinical activities

Recommended participants should include at a minimum:

- Physician representing physicians' association(s)
- Nursing representative
- Physician representing medical schools
- Representative from patient safety organization
- Representative of employer community
- Physician representing hospital/health system
- Other healthcare providers (e.g., EMT, home health, etc.)
- Representative from public health

Legal and Governance Workgroup

- Provide advocacy when needed and build trust, buy-in, and participation of major stakeholders statewide including public health.
- Serve as a resource for best practices for data security, data use agreements, privacy, and confidentiality that can be applied in Michigan.
- Establish standards for audit trails and data verification/data integrity checks. Fund costs of monitoring and auditing and investigating complaints.
- Establish a means for developing consensus on legal interpretations of applicable laws, consider limits on liability for those who meet or exceed the standards identified.
- Provide input on federal and state laws that govern maintenance and transmission of electronic health information, engage technical experts on design of system to address and facilitate legal compliance. (e.g., HIPAA privacy, HIPAA security, other federal and state laws governing confidentiality).
- Convene stakeholder focus groups (providers, regulators, consumers) to provide input on proposed changes to Michigan law and facilitate discussion to avoid unintended consequences.
- Develop model documents or templates for inclusion in the Reference Guide (e.g., model clause regarding HIE for Notice of Privacy Practices, authorization forms, participant agreements, vendor

agreements regarding software). Develop answers to FAQs for Reference Guide (written in general terms) to address legal questions about starting an HIE.

- Assist with the development of a master provider index, which identifies all licensed personnel in the state who are qualified to access health information through the HIE. Additionally, assist with the development of a master patient index. Facilitate maintenance and record-keeping to ensure that the index remains accurate and updated.
- Establish requirements for creating, administering and terminating access rights to the HIE. Permit the HIE governing body to suspend access as necessary or appropriate, and insulate the governing body from liability for such decisions made in good faith.
- Establish stringent measures for enforcement against individuals who engage in behaviors intended to, or likely to without valid reason, bypass or overcome security measures.
- Prioritize recommendations in *Conduit to Care* that need further study, set goals and timelines according to priorities.

Recommended participants should include at a minimum:

- Board chair or equal representative from at least one of the more advanced exchange initiatives
- Hospital/health system executive or board member
- Representative of a physician group
- Representative of one of the major payers
- Representative of employer community
- Representative from MDCH/MDIT
- Representative of the American Civil Liberties Union (ACLU)
- Privacy Officer or equal representative with expertise in HIPAA Privacy Regulations and other federal privacy laws, and state confidentiality laws
- Security Officer or equal representative with expertise regarding compliance with HIPAA Security Regulations and other laws governing electronic health information.
- Representative of MDCH or local health department with expertise regarding health information collected or maintained by the State and/or local health departments for public health or other purposes, public health reporting requirements and surveillance initiatives, and applicable state laws
- Attorney or equal representative with expertise regarding regulation of health professionals and health facilities and agencies (e.g., licensing laws, federal and state Stark, antitrust)
- Attorney or equal representative with expertise regarding business law aspects of HIE, such as laws governing nonprofits, corporations and other business entities, contracts, intellectual property, tax law.

Financial Workgroup

- Provide guidance for distribution of funding through the HIT Commission
- Analyze benefits of potential HIT investments as requested by the HIT Commission and MiHIN Resource Center
- Provide recommendations of financial strategies to increase adoption and funding of health data exchanges
- Assist in the development of business cases for various investments in health information exchange on a statewide basis
- Provide guidance on grants available from public and private sources

Recommended participants should include at a minimum:

- Board chair or equal representative from at least one of the more advanced exchange initiatives
- Hospital/health system executive or board member
- Representative of a physician group
- Representative of one of the major payers
- Representative of employer community
- Representative from MDCH/MDIT
- Representative from private foundation
- Representative from public accounting (specifically someone with healthcare expertise)

Regional Workgroup

- Obtain Michigan Department of Community Health agreement with criteria to be used in designating regional health information exchanges
- Meet with key leaders of the governing entities of existing and start-up regional HIE efforts to learn “best practices”, communicate criteria, educate on Reference Guide, etc.
- Develop and participate in delivering an education plan for large employers, business coalitions, Chambers of Commerce, etc. regarding the importance of HIE
- Directly approach major employers regarding HIE and the need for them to be involved as stakeholders for regional HIEs

Recommended participants should include at a minimum:

- Board chair or equal representative from at least one of the more advanced exchange initiatives
- Hospital/health system executive or board member
- Representative of a physician group

- Representative of one of the major payers
- Representative of employer community
- Representative of healthcare law firm familiar with not-for-profit and HIT
- Representatives from each Michigan HIE

Technical Workgroup

- Provide recommendations regarding possible technical architectures that can be used to facilitate health information exchange (including Master Patient and Provider Indexes, security protocols and options, network robustness, disaster recovery, etc.)
- Provide guidance/guidelines on national and developing standards
- Consulting with established HIEs or those wishing to begin HIE effort
- Education (within broader efforts of MiHIN and HIT Commission)
- Brokerage with other HIEs

Recommended participants should include at a minimum:

- Representative from at least one of the more advanced exchange initiatives
- Hospital/health system representative
- Representative of a physician group
- Medical school representative
- Representative of employer community
- Representative of a major payer
- Representative from MDCH/MDIT
- Individual representing health information technology field
- Representative of a major physician group (should be clinician using IT in daily practice)
- Representative from non-physician clinical specialty (who uses IT in daily practice) (e.g., nursing, physical therapy, etc.)
- Representative from group supporting primary care in MI (e.g., MPCA)

APPENDIX J: MEDICAL TRADING AREA ANALYSIS

Introduction to Medical Trading Area Analysis

This analysis can be started with simple charts, graphs and maps. Those from discharge analysis and other tools should be used, such as the information in the Dartmouth Atlas for Michigan:

<http://www.bcbsm.com/atlas/geography.shtml>. Many of the areas would resemble the federal government's definition of metropolitan statistical areas but will go beyond those areas where there is an established pattern of health care services provided to patients outside the metro area or where there is a significant non-metro population grouping not yet defined as a metro area.

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

Qualitative Building Blocks:

- Recommended Planning Elements:
 - There should be flexibility for inclusion in the Medical Trading Areas. They should be inclusive, not exclusive. Providers may need to be in more than one medical trading area.
 - The Medical Trading Areas must work for the providers to improve efficiency and quality. What is best for the provider will ultimately be best for the patient.
 - The providers should drive the Medical Trading Areas and shape them.
 - Being involved in the Medical Trading Area should give organizations a competitive edge, but not create a competitive edge over another organization also involved.
 - There must be flexibility because different areas will have different approaches to health care based on culture.
- Recommended Implementation Elements of a Regional Exchange:
 - The technical infrastructure for each area should include a central switch to send and receive data. There should be technical hardware, such as Internet access, facilities and infrastructure as well as a standard patient identification system and consistent data.
 - The “what” and “how” of this should be a state role, especially in setting standards, assuring transferability between Medical Trading Areas, and fitting in with federal standards that may emerge
 - Must be treated as a unique entity with a sustainable business model
 - Decisions on services to be offered should be based upon market and pricing/cost in that market

Quantitative Building Blocks:

- Planning Minimums:
 - Average Minimum Population Size: 250,000 people
 - Minimum Percentage of Services: 3 or more separate organizations representing at least 60% of Hospital Discharges, 50% of lab work, and 50% of the data in at least 3 other categories listed above.
- Implementation of a Regional Exchange Minimums:
 - Average Minimum Population Size: 500,000 people
 - Minimum Percentage of Services: 3 or more separate organizations representing 70% of the hospital discharges, 60% of lab results and 60% of 3 other categories from above.

Additional Details on Medical Trading Areas

We have developed a medical trading area analysis to analyze the claims of beneficiaries of particular health plans from a designated geographic area such as those outlined in the atlas report or others. This analysis is used to determine what clinical service providers and specialty procedure and testing physicians would be needed as participants in a local or regional HIE to provide the vast majority of the clinical results, reports, and documents necessary to meet the goals of the Health Information Exchange users. It would make sense to do the analysis to determine how many providers and their volumes of services would be required to serve the population of an area defined by those who plan to develop an HIE for an area. The area must be big enough to support the expense and resource requirements of an HIE. The types of services one would typically include in such an analysis would include but not be limited to the following services:

- Inpatient discharges
- Emergency service visits
- Outpatient hospital services such as
 - Laboratory
 - Radiology
 - Rehab services
 - Cardiology procedures
 - EEGs, EKGs, pulmonary function
- Hospital outpatient surgeries
- Urgent care center visits
- Primary care office visits
- Specialty physician office visits
- Imaging center procedures
- Free standing surgery centers
- Birthing centers
- Pharmacies prescriptions
- Commercial laboratories procedures

- Anatomical path analysis
- Mental health visits
- Long-term care days
- Home health visits

The vast majority of the reports, documents and procedures completed are not addressed in the hospital analysis alone.

The following information is support for the quantitative building blocks recommended by the Regional Workgroup in the *Conduit to Care*.

- A. The volume of service in each category and the number of providers in the region required to participate in the HIE in order to reach certain threshold metrics in order to reach 60%, 70%, 80% or 90% of the clinical data, by type, needed to meet the needs of the physicians who ordered the tests, the consulting and referring physicians, the disease management programs, the community summary record users, and the public health programs. In the long run, an HIE may want to provide or interface a patient's clinical data to their personal health record as well.
- B. The identification of the clinical service providers outside the service area, or medical trading area, who provide enough service to warrant inclusion in the scope of the providers who are necessary to meet the threshold levels but are not deemed part of the community by virtue of their distance, a small proportion of their total services provided in this area, or other factors. Many of these may be large national concerns like commercial laboratories or national chains of pharmacies.
- C. The identification of geographic areas where large proportions of the services are provided by providers outside their chosen designation of a medical trading area, in one or many different directions and locations.
- D. The critical mass of beneficiaries necessary to support an HIE may range from 250,000 on the low side to areas of 500,000 to 750,000 covering multiple counties. Areas larger than those mentioned are usually more complex and diverse. They may have complex relationships among and between providers, diverse and complicated referral and service delivery patterns, and more difficult organizational problems (areas like Chicago, Detroit, Philadelphia, Baltimore/Washington, Oakland/San Francisco Bay area and Los Angeles). The opportunities are great but the challenges seem much greater.
- E. The Dartmouth Atlas will aid as one of the tools to help define some beginning points of geographic definition for the initiation of the process but many dynamics will unfold as one accesses and analyses the data. It is important for success that the major insurers, Medicaid, Blue Cross, and the State participate with all of their beneficiary data (de-identified) to broaden the base of the analysis.

- F. Much can be learned in the assessment of the real opportunities for the use and value of clinical information exchange if the full range of clinical data sources and potential users, benefits, beneficiaries, and funding sources are explored beginning with the Medical Trading Area analysis suggested.
- G. The population of beneficiaries who utilize the health care providers extensively will also yield a number of key findings, which for those really exploring a sustainable business model, will provide a clear path of future developments and data sources with a very strong benefit for those who chose to use clinical data for patient safety, efficiency and quality improvement.
- H. The Financial Group recommends this type of analysis when a group files for a planning grant, or for implementation funding.
- I. The Governance Group may want to use this type of analysis to determine those who may be potential members of the regional organizational governance and would be desired as signatories on letters of intent or commitments for matching funds.
- J. The Technical Workgroup should use this type of analysis, in conjunction with knowledge of the existing state of HIT development and implementation in region, to make recommendations concerning technologies and processes to leverage and those to discontinue.
- K. The MiHIN Resource Center may use the analysis to assist with the identification of those clinical service providers who have service levels in many medical trading areas across the state and to determine the extent of the service to assist them with their priorities for policy and operational issues to encourage their participation in the provision of clinical data to regional HIEs across the state.

Example of a Medical Trading Area Analysis:

The Capital Area Regional Health Information Organization, with the help of the Institute for Health Care Studies at Michigan State University, performed a Medical Trading Area Analysis to begin the assessment of the preliminary geography, the concentration of clinical service providers and physician practices which are within the three county area who provide the majority of services to the patients of the area. Further, they were interested in estimating the level of service provided in the area of different types and numbers of providers. Of course an important analysis was the identification of clinical service providers whose organizations were located outside the three county area who provided a significant proportion of the area services.

This analysis will help the sponsors to determine the scope and breadth of the number and location of potential customers for the exchange and also to clarify with statistics the extension of the geography outside the three county area.

APPENDIX K: GLOSSARY

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

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

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

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

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

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

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

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

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

Continuity of Care Record (CCR) - A standard specification being developed jointly by ASTM International, the Massachusetts Medical Society (MMS), the Health Information Management and Systems Society (HIMSS), the American Academy of Family Physicians (AAFP), and the American Academy of Pediatrics. It is intended to foster and improve continuity of patient care, to reduce medical errors, and to assure at least a minimum standard of health information transportability when a patient is referred or transferred to, or is otherwise seen by, another provider. The origins of the CCR stem from a Massachusetts Department of Public Health, three-page, NCR paper-based Patient Care Referral Form that has been in widespread use for many years in Massachusetts, and from other minimal data sets both electronic and paper-based. The CCR is being developed and enhanced in response to the need to organize a set of basic patient information consisting of the most relevant and timely facts about a patient's condition. Briefly, these include diagnoses, recent procedures, allergies, medications, recent care provided, as well as recommendations for future care (care plan) and the reason for referral or

transfer. The CCR will be created by a health care provider/clinician at the end of an encounter, or at the end of an episode of care, such as a hospital or rehabilitation stay. www.massmed.org/pages/ccrfaq.asp

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

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

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

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

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

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

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

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

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

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

ICD-9 (International Classification of Disease, 9th revision) – International disease classification system developed by the World Health Organization (WHO) which provides a detailed description of known diseases and injuries. The classification system is used worldwide for morbidity and mortality statistics, reimbursement systems and automated decision support in medicine.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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