Electronic Health Information
In the Context
Of the
Texas Medicaid Program

Health and Human Services Commission
Office of Medical Technology

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Executive Summary

Section 10 of S.B. 1188, 79th Legislature, Regular Session, 2005, directed the Health and Human Services Commission (HHSC) to establish an Office of Medical Technology (OMT). Its mission is to explore and evaluate new developments in medical technology and propose implementing the technology into the Medicaid program if appropriate and cost-effective. The field of Electronic Health Information is a closely watched and highly anticipated emerging health care technology, and as such, is a natural area of interest to OMT, as well as other stakeholders in the health care industry.

There is little doubt that some day electronic health record (EHR) systems will be in widespread use and will become an indispensable element of our national health care infrastructure. The ideal EHR system of the future would provide the basis for improved efficiency and safety in the delivery of health care. Many EHR advocates also champion the notion that these systems will decrease the cost of health care and improve the health status of the population.

Until that day arrives, policy makers in both the public and private sectors must decide how to engage the dynamic processes through which the promise of the future may be realized. The objective of this report is to analyze the role of the Texas Medicaid program in relation to the various emerging federal and state initiatives that exist to promote the widespread implementation of EHR systems.

This report will provide a high-level discussion and analysis of:

- The term "electronic health records," along with examples of the various types of systems likely to be available in the marketplace.
- The range of national, state, regional, and local initiatives related to the use of electronic health records.
- The anticipated benefits of EHRs as they may evolve at various stages of development.
- The challenges that must be successfully engaged before the full promise of EHRs can be realized.
- The anticipated financial costs of implementing EHRs and the return on investment (ROI) that may accrue.
- How, when, and why the implementation of EHRs could result in cost savings and/or improved health status of Medicaid beneficiaries, from the perspective of the Texas Medicaid program.

This report concludes that there are two basic policy approaches to the investment of public funds for the purpose of accelerating the implementation of EHR systems.

1. Invest in EHR systems because accelerating deployment of these systems promotes good public policy in its own right, or;
2. Invest in EHR systems in situations where a high likelihood of net fiscal savings is anticipated, that is, invest as part of a business plan because of an anticipated positive ROI.

These two approaches are not mutually exclusive. However, for any given investment decision, policy makers must discern which of these criteria are most appropriate.

Electronic Records Today

Today's Reality

Given that the worldwide, exponential trend toward adoption of computer-based business technology has been in process for over three decades, one may ask why the health care infrastructure in the United States seems to be – and is – so far behind the automation curve. There are several important reasons.

First, and perhaps foremost, health care is a highly customized and individualized service, and as such, economies of scale are not as easily achieved as in other industries. Most medical care in the U.S. is delivered in physician offices or other outpatient clinics. Broadly speaking, physicians and other licensed health care professionals provide two types of services: (1) cognitive evaluation and management services, and (2) surgical or invasive procedures.

Most people are familiar with cognitive evaluation and management services in the context of their own annual physical examination, or perhaps because of a recent visit to the doctor to evaluate symptoms of an illness. The economic value of such services stems from the ability of the provider to apply their professional skill and knowledge to the task of correctly assessing, diagnosing, treating, or managing the situation at hand. Similarly, people intuitively understand the nature of surgical or invasive procedures. Here again, the value of the service lies in the special professional skill and training brought personally by the provider.

In this context, the slow pace of automation in the health care industry is more understandable, given that much of the value of medical services flows directly from actions – cognitive or procedural – performed personally by an individual health care professional in response to the unique needs of an individual patient. This fact has traditionally led many medical providers to conclude that they did not need, or did not have a practical way, to automate key aspects of their clinical care.

In addition, the functions of each type of EHR system must be customized to fit the size, functional needs, and complexity of each provider situation. The EHR system suitable for a large hospital system will not be the same as that suitable for a solo or small group practice. Moreover, health care providers of every size typically find that the cost of a suitable EHR system represents a significant capital investment. Providers continue to express concerns about when, and to what degree, they might enjoy a return on such an investment. The standard reimbursement structures in use today do not assign any specific economic value for provider use of EHR systems. Therefore, most health care payors do not provide direct economic incentive for the health care delivery system to invest in EHR deployment.

The pace of adoption has also been slowed by the fact that technical and certification standards are currently being debated at the federal level. Health care providers are wary of purchasing a system today that may be obsolete next year.

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There is not yet a clear "social contract" that unambiguously supports the free exchange of the protected health information that must be at the center of any EHR system suitable for widespread use. While patients would certainly welcome a system that alerts health care providers of all special medical needs, avoids mistakes, and reduces the need to fill out page after page of paperwork at every encounter, it is unclear who should store or have access to patients' personal health information. Patients will insist upon ironclad security and will want to forbid uses of data that are discriminatory or result in denial of health coverage.

Perhaps most challenging of all, it is not yet known who will own this health information. This is especially important, given that the data contained in EHR systems will have incredible potential economic value across nearly the entire range of stakeholders in the health care industry. The information that could be gleaned from EHR systems on both an individual and an aggregate level could guide not only public health policy, but could also guide the allocation of health care resources, as well as the development and marketing of health care services. The challenges presented by issues of privacy and ownership should not be underestimated.

Definition

The concept behind EHR is not entirely new. As this technology concept has matured, the terminology used to describe it has also gone through many changes. This report will use the term "electronic health records" to refer to the entire range of electronic health information systems. EHR systems are patient-specific and refer to a longitudinal, real-time, interoperable, computerized health record of the patient, representing standardized patient health information that can be presented to, and/or accessed and updated by, any authorized health care provider.

While this report has elected to adopt the terms EHR and EHR systems, the literature on the subject presents a wide array of acronyms (see Table A).

Table A
Terms Used in Literature on Electronic Health Records

EHR Terminology	Acronym
Electronic Medical Record	EMR
Health Information Technology	HIT
Health Information Infrastructure	HII
Electronic Health Information	EHI
Health Information Exchange	HIE
Electronic Personal Record	EPR
Personal Health Information	PHI
Personal Health Records	PHR

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An EHR system may include functions that provide the following.

- A longitudinal collection of electronic health information about the health of an individual or the care provided, including:
  - •• past medical history,
  - •• immunization status,
  - •• records of clinical observations and professional services, and
  - •• immediate electronic access to patient and population level information by authorized users, including:
    - o results of diagnostic testing (x-rays, imaging studies),
    - o EHR data from other physicians involved in the patient's care, and
    - o referrals for specialist care.
- Decision support to enhance the quality, safety, and efficiency of patient care, and support of efficient processes for health care delivery.[1]
- Electronic order entry and electronic prescribing, that can include:
  - •• safety alerts (know drug allergies and drug-drug interactions), and
  - •• drug formulary data.
- Secure electronic messaging (provider-to-provider or provider-to-patient) to address:
  - •• health risk appraisals,
  - •• disease prevention, and
  - •• patient education.
- Clinical interface with business functions, such as:
  - •• correspondence
  - •• billing, and
  - •• claims processing.

Public Initiatives

Federal Initiatives

Office of the National Coordinator for Health Information Technology
In April 2004, President Bush issued an executive order to establish the Office of the National Coordinator for Health Information Technology (ONCHIT), serving under the Secretary of Health and Human Services. David Brailer M.D., Ph.D., was named the first National Coordinator for Health Information Technology. The goal of the new office was to develop a ten-year strategic plan and to implement, through joint public and private partnerships, a national interoperable health information infrastructure, incorporating the following objectives.

- Create interoperable and always current electronic health records.
- Improve quality of care through error reduction and delivery of evidence-based medicine.
- Provide timely decision support for clinicians.
- Provide cost-effective care by reducing duplicative care.
- Improve research to bedside - efficient delivery.

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[1] GAO Health Information Technology. GAO-05-628 Washington, D.C; May 2005.

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- Improve healthcare access to medically underserved.
- Provide direct consumer involvement in personal healthcare.
- Maintain and improve accuracy and privacy of records with misuse punishable by law.
- Improve public health monitoring.[2]

The report, "*The Decade of Health Information Technology: Delivering Consumer-centric and Information-rich Health Care,*" outlines the broad steps necessary to achieve EHRs for Americans. The following national goals, developed by the ONCHIT and titled the National Health Information Infrastructure (NHII) Strategic Framework, outline the vision for improved healthcare.[3]

- Goal 1 - Inform Clinical Practice
  - ●● Provide incentives for EHR adoption
  - ●● Reduce risk of EHR investment
  - ●● Promote EHR diffusion in rural and underserved areas

- Goal 2 - Interconnect Clinicians
  - ●● Form regional collaborations
  - ●● Develop a national health information network
  - ●● Coordinate federal health information systems

- Goal 3 - Personalize Care
  - ●● Encourage use of Personal Health Records (PHRs)
  - ●● Enhance informed consumer choice
  - ●● Promote use of telehealth systems

- Goal 4 - Improve Population Health
  - ●● Unify public health surveillance architectures
  - ●● Streamline quality and health status monitoring
  - ●● Accelerate research and dissemination of evidence

Technologies are available to build privacy and security into the health information infrastructure (HII) through the following methods.

- Employing effective user authentication techniques.
- Ensuring that only data that needs to be released are released.
- Restricting EMR viewing to those with explicit permission in the medical community.
- Segmenting data so that personal information is separated from clinical information.
- Using biometrics in place of passwords.
- Using Smart Cards for basic personal health data.

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[2] HHS Fact Sheet—HIT Report at a Glance, "The Decade of Health Information Technology: Delivering Consumer-centric and Information-Rich Health Care".
[3] HHS Fact Sheet—HIT Report at a Glance, "The Decade of Health Information Technology: Delivering Consumer-centric and Information-Rich Health Care".

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Federal Advisory Commission
In September 2005, the U.S. Department of Health and Human Services (DHHS) Secretary Mike Leavitt selected 16 commissioners to serve on the American Health Information Community. This public/private commission will advise Secretary Leavitt on how to make health information digital and interoperable. "The Community will adhere to an aggressive timetable that focuses on the areas of critical need – such as adverse drug event reporting, and biosurveillance – as we get about the work of developing, setting and certifying standards," stated Leavitt.[4]

Pilot Software/Contracts Awarded
Also in September 2005, the Centers for Medicare and Medicaid Services (CMS) issued an "evaluation" version of Vista-Office EHR (Vista-Office) software available from qualified vendors. The release of this software, an adaptation of the Veterans Health Administration EHR, will enable assessment of its effectiveness in private medical offices and will supplement efforts by the American Health Information Community to establish certification criteria. The software contains functions such as order entry, documentation templates, and clinical reminders along with additional enhancements including physician office patient registration, reporting of quality measures, and printing/faxing medication prescriptions. There is a small fee to obtain the software as well as additional costs for vendor support. To address this need, CMS funded a Vista-Office Vendor Support organization, WorldVistA, to provide training for vendors.[5]

In October 2005, DHHS awarded contracts totaling $17.5 million to public/private groups to accelerate the adoption of health information technology (HIT) across the U.S. The following groups were awarded and will deliver reports to the American Health Information Community.

- **American National Standards Institute (ANSI)**: $3,300,000
  ANSI is a private, non-profit organization, which facilitates the development of American National Standards and accredits the procedures of standards developing organizations.
- **Certification Commission for Health Information Technology (CCHIT)**: $2,700,000
  CCHIT has a three-year contract and a mission to accelerate the adoption of HIT by creating an efficient, credible and sustainable product certification program. Its first efforts will be on ambulatory EHR products for the office-based physician.
- **The Health Information Security and Privacy Collaboration (HISPC)**: $11,500,000
  HISPC will assess the variations in organization-level business policies and state laws that affect health information exchange; identify and propose practical solutions, while preserving the privacy and security requirements in applicable federal and state laws; and develop detailed plans to implement solutions.

The contractor will coordinate this effort with state and territorial governments through the issuance of subcontracts to the Governor's offices or their agents. Funding of up to 40 individual state projects will assess business practices that affect the exchange of interoperable electronic health information and any related privacy and security laws.[6]

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[4] DHHS Press Release: "Commissioners Selected for American Health Information Community. The Community will Help Shape the Future of Health Care for Generations" September 13, 2005.
[5] CMS press release: "CMS Delivers Electronic Health record Software to Physician Offices" September 19, 2005.
[6] DHHS Press Release: " HHS Awards Contracts to Advance Nationwide Interoperable Health Information Technology". October 6, 2005.

Shortly following, DHHS awarded contracts totaling $18.6 million to a consortium of four technology developers and health care providers in three local healthcare markets to develop prototypes for a Nationwide Health Information Network (NHIN) architecture. The four business participants of the consortia are Accenture, Computer Science Corporation (CSC), International Business Machines (IBM), and Northrop Grumman. They will keep the American Health Information Community informed as they work to implement a standards-based network prototype planned for the end of 2006. Prototypes will test patient identification and information locator services; user authentication, access control, and other security protections and specialized network functions, as well as large-scale deployment. Once designed, the technical specifications for each network's architecture will be placed in the public domain to encourage further approaches to implementing HIT.[7]

In August 2006, the *Washington Post* reported that Secretary Leavitt informed the National Governor's Association that President Bush will sign an executive order to require physicians and hospitals that provide care to the Medicare population, to use information technology (IT) standards. The standards will be those recommended by the American Health Information Community for laboratory results, prescriptions, and communication between health care providers and patients. The executive order will also set standards of care and will create a uniform method of reporting outcomes.[8]

On March 8, 2006, CMS issued a request for proposals (RFP) to test the feasibility of transferring claims data information into beneficiaries' PHRs. In addition to functionality, CMS also requested information on business and operational aspects of data exchanges, including procedures for access, disclosure authorization, authentication, and reporting. In theory, CMS would transform claims data into layman's terms for input into PHRs and would provide secure access for authorized users and generate medication histories and printable reports.[9]

Department of Veterans Affairs
The Department of Veteran's Affairs (VA) is gradually gaining a degree of public recognition proportionate to the remarkable success of the EHR system it has deployed across its entire VA system. In July 2006, Harvard University recognized the VA's computerized patient records as one of the "top 50 government innovations of 2006" and awarded them Harvard's prestigious "Innovations in American Government Award", an award which honors excellence and creativity in the public sector. The VA claims the cost of maintaining the EHR VistA software is $80 per-patient, per-year and in the last ten years, and that VistA's efficiencies have offset cost increases associated with a 100 percent increase in veterans receiving VA care.[10] Ten years ago, 60 percent of the VA patient paper charts were immediately available. Today, nearly 100 percent are available 24 hours a day, 7 days a week at all 1,400 VA offices. The system now allows computerized patient records access for each veteran who uses its health care system.[11]

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[7] DHHS Press Release: "HHS Awards Contracts to Develop Nationwide Health Information Network", November 10, 2005.
[8] Broder, David S., "Administration Aims to Set Health Care Standards". Washington Post, August 7, 2006 Section A04.
[9] Mosquera, Mary. "CMS Explores Transferring Claims Data Into PHRs". Government Computer News. March 7, 2006.
[10] VA News Release. "VA Receives 2006 Innovations in Government Award" July, 10, 2006.
[11] VA News Release. "Harvard Honors VA's Computerized Patient Records System". April 11, 2006.

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State Initiatives

Across the U.S., there has been activity to build health information exchanges (HIE). Since these initiatives are in an infancy stage, there are no official examples as to what is termed a sustainable, viable, and functioning HIE. Yet, there are attempts by several states to create an infrastructure that can feed into a National Healthcare Information Network (NHIN). Many HIEs are structured as non-profits, and for many it is not quite clear how their respective state Medicaid programs interact or contribute. Appendix A lists a few examples of emerging public HIEs in states other than Texas.

Texas

Texas Health Information Technology Advisory Committee
S.B. 45, 79th Legislature, Regular Session, 2005, was authored by Senator Jane Nelson and sponsored by Representative Dianne White Delisi to create a Healthcare Information Technology Advisory Committee (HITAC) organized under the Statewide Healthcare Coordinating Council (SHCC). The SHCC is a council comprised of 17 members, 13 of which are appointed by the Governor. The SHCC is required to develop a six-year State Health Plan with biennial updates to guide Texas leaders in the formulation of a healthcare workforce policy.[12]

The SHCC six-year Texas State Health Plan recommendations related to technology are:

1. The Legislature should support initiatives that will promote the application of technology in all areas of health education and clinical care.
2. The Legislature should instruct health professionals and other regulatory agencies and boards to support strategies that could incorporate the use of technology to reduce paperwork and streamline the process required by regulatory agencies to that which is truly necessary for quality patient care.
3. The Legislature should support methodologies for the development of innovative models for the delivery of primary care.
4. The Legislature should provide positive financial incentives for providers who implement the use of evidence-based health care and the use of outcome-based practice guidelines that have been approved and agreed upon by a nationally recognized health association.[13]

The HITAC, as a permanent advisory committee to the SHCC, is charged with developing a long-range plan for the use of HIE technology including the use of EHR systems, computerized clinical support systems, computerized physician order entry, regional data sharing interchanges, and other methods to improve patient outcomes and cost effectiveness through incorporating information technology.

The HITAC convened its first meeting in January 2006 and developed three workgroups at its meeting held March 8, 2006. The HITAC provided its final recommendations as a state plan on

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[12] Texas Health Institute. "Health Information Technology: Creating a Health Information Network in Texas". Policy Brief. December 1, 2005, pgs. 2-3.
[13] Texas Statewide Health Coordinating Council. Texas State Health Plan 2005-2010. November 2004. Accessed April 2006.

November 1, 2006.

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│                              HITAC Plan                                       │
│                                                                               │
│  1.  Will include formalized input from stakeholders within identified IT     │
│      domains (e.g., data standards, regional health information               │
│      organization, EHR and disease management);                               │
│  2.  Will include recommendations to accelerate the adoption of IT and an     │
│      electronic health information infrastructure to support quality, safety  │
│      and efficiency within the healthcare arena;                              │
│  3.  Will consider the public health implications of health IT;               │
│  4.  Will emphasize the applications of health IT within the educational and  │
│      employment arena of the healthcare workforce.                            │
│                     **Texas Statewide Health Workforce and Health IT Summit   │
│                                                     Overview, May 2006         │
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Texas' State Hospital System
The state hospitals operated by the Department of State Health Services (DSHS) have used an EMR system since 2002 and are 90 percent paperless at this time. Currently, all ten institutions have nearly fully functional, 24-hour, EHR systems, which are a product of NETSMART (formerly Sociomedics) that DSHS purchased. The EHR system is divided into three parts: 1) Clinician Work Station (CWS) or clinical, medical, and administrative screens; 2) AVATAR PM - demographic and other patient information; and 3) WORX – pharmacy management system.

State Hospital Services Designed into an Integrated System

Admissions/Background Information	Legal/Commitment Status
Treatment Scheduling	Progress Notes
Critical Incident/Event Information	Assessments
Diagnosis	Consultations
Lab	Pharmacy
Medications	Authorization Information
Order Entry	Treatment Planning
Discharge Planning	Other medical/clinical information

The Texas state hospital system is in the process of purchasing an enhancement that will allow clinical providers to sign the hospital record electronically. While the present system links all ten hospitals, it does not interface with the Texas Community Mental Health Centers. So, while the hospital systems are interoperable, they do not have a complete longitudinal, interconnected, EHR system that incorporates important components of state-funded mental health care.

Specialized Archives - ImmTrac
ImmTrac, the Texas immunization registry, is a confidential, statewide repository of immunization records for Texas children under 18 years of age. ImmTrac consolidates data reported from multiple sources statewide to provide the most complete immunization history for a client. Data sources include public and private health care providers, health plans and Medicaid, DSHS Vital Statistics, Women, Infants and Children program (WIC) clinics, and local registries. Immunization information is reported via the ImmTrac Internet application or by

electronic data import. Providers, payors, schools, and childcare facilities are all authorized to access registry immunization information. ImmTrac offers reminder/recall capability and other reporting capability for use by providers and public health authorities. ImmTrac currently contains over 53 million immunizations reported for 5.2 million clients. Over 2,400 active online user sites access ImmTrac data.

In early 2005, ImmTrac established electronic interfaces and improved business processes to facilitate reporting by health plans, Medicaid, and health care providers. During 2005, the number of records reported electronically by Medicaid and health plans increased over 500 percent to 4.4 million immunizations. Records reported electronically by health care providers increased over 50 percent to 4.6 million. Immunizations reported online through the ImmTrac Internet application increased 77 percent to over 1.1 million during 2005.

ImmTrac is currently developing electronic data exchange capability based on the Health Level Seven (HL7) standards and is implementing advanced data translation systems. This capability will facilitate reporting and data exchange with provider groups, physician networks, billing clearinghouses, and EMR systems. During 2007, ImmTrac plans to implement an enhanced electronic interface with the DSHS Texas-Wide Integrated Client Encounter System (TWICES). The ImmTrac-TWICES integration will offer TWICES users easy access to ImmTrac data as well as real-time immunization reporting and data exchange. ImmTrac will also work with EMR vendors to develop electronic reporting and interface capability and facilitate provider participation in the registry.

Clearly, the scope of ImmTrac is limited to immunization data. While ImmTrac does not address the full range of clinical data that might be found in the office-based applications used by clinical providers, ImmTrac is, nonetheless, a large and potentially significant example of an EHR-like system that is already in use statewide. The functionality and value of ImmTrac could be enhanced by more complete data. Some professional provider associations have also advocated for retaining ImmTrac data beyond the patient's 18th birthday.

Additionally, DSHS supports other registries such as the Texas Cancer Registry and the Texas Birth Defects Registry. DSHS also supports the Behavioral Health Integrated Provider System (BHIPS), which is a web-based application tool for clinicians to ensure consistent, quality services through record keeping and data sharing.

Smart Cards – Medicaid Access Card
Smart cards allow users ownership and portability of their health information by using encrypted data within embedded chips together with a photo ID. The user then offers this card to the provider at the point of service. These cards can be loaded with a patient's health information such as demographics, allergies, current medications, laboratory results, etc., and can be updated by healthcare professionals who are included in the regional smart-card network. In the paragraphs that follow, another form of smart card, the authentication card, will be discussed. The authentication pilot is the only currently active smart card project, but is only used to validate the identity and program eligibility of the user. The State does not have the capability at this time to access all the clinical information that could potentially be loaded onto a smart card.

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As directed by H.B. 2292, 78th Legislature, the Texas Health and Human Services Commission (HHSC) implemented a Medicaid front-end client authentication pilot called the Medicaid Integrity Pilot.[14] This pilot was initially deployed and operated with four separate vendors in six Texas counties. Pilot operations began in March 2004 and ended in August 2005 with voluntary participation of Medicaid clients and providers. This initial pilot allowed HHSC to evaluate each of the vendor solutions for best practices and technologies, and develop a single solution to meet program objectives.

From this pilot, HHSC identified a "best-practice" vendor and determined that mandatory participation for front-end Medicaid service delivery should be tested before implementing statewide. Consequently, the Medicaid Access Card (MAC) project took effect in December 2005. This current expanded project involves one vendor and three counties - Travis, Cameron and Hidalgo - along with mandatory direct-care provider participation. For the duration of this project, all direct-care providers are supplied card reader and biometric scanner equipment. Those providers excluded from this phase of the project are non-direct-care providers such as medical equipment providers, laboratories, home health, ambulance, nursing home and psychiatric hospital providers.

The system has been designed and developed to make improvements to the Medicaid process that the Commission believes will provide significant benefits for all stakeholders of the Medicaid Program. The Medicaid Access Card project report was released in December 2006.[15]

Major benefits offered by the Medicaid Access Card project include:

- Express Client Check-In
- Rapid Automated Client Authentication
- Quick Medicaid Eligibility Verification
- Improved Claim Approvals

Other notable smart card implementation programs in the U.S. include two major healthcare institutions in New York City, Mount Sinai Medical Center and Elmhurst Hospital Center, which are forming an alliance to deploy 100,000 cards in the first phase roll-out. Eventually, the smart card will link 45 affiliated healthcare facilities in the New York metro area.[16]

Foster Care Passport
As directed by S.B. 6, 79th Legislature, Regular Session, 2005, HHSC issued an RFP on July 19, 2006, for a comprehensive healthcare program for children in foster care. The program includes the development and maintenance of a web-based health passport system that will provide an EHR for each foster-child member. The health passport will be *Health Insurance Portability and Accountability Act of 1996* (HIPAA) compliant and will facilitate service management and continuity of care for its members, as well as streamline data sharing and coordination between members' providers and the Department of Family and Protective Services (DFPS). The contract was tentatively scheduled for award in November 2006, but as of

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[14] HHSC Report to the Legislature – Medicaid Access Card Project, March 2006.
[15] HHSC "Medicaid Access Card" Project Overview, January 2006.
[16] Siemens News Release, "Siemens, The Mount Sinai Medical Center and Elmhurst Hospital Center form Patient Health Smart Card Alliance Will Goal of Serving Residents and Health Care Facilities in New York Metro Area". December 5, 2005.

January 2007, is still in the process of negotiations. Further technical and functional details of the passport will be available once the final contract has been awarded.

Integrated Care Management (ICM)
ICM is a new care management and health care delivery model currently under development at HHSC. H.B. 1771, 79th Legislature, Regular Session, 2005, required that ICM be a non-capitated model that will combine medical and administrative management of both acute and long-term care services provided to eligible members residing in the community. ICM will be implemented in the Dallas-Fort Worth area. The ICM RFP includes provisions for the deployment of an electronic health information (EHI) system that would allow the HIPAA-compliant interchange of medical records data among ICM providers. The goal is to reduce duplication and improve the efficiency of the provision of ICM services.

Medicaid Claims Data and Decision Support Systems
This report would not be complete without a discussion of the health care data sources that are currently available to Texas Medicaid. What are these data sources? Do these data sources provide the same type of information that could be garnered from an advanced, widespread, interoperable EHR system?

The fundamental difference between the existing systems maintained by Medicaid and an ideal future EHR system is that existing data describes what Medicaid has paid for, while in contrast, an ideal EHR system contains in-depth clinical documentation.

The existing systems contain records of all the claims submitted by physicians and other providers for services they have rendered to their Medicaid-eligible patients. Each individual claim includes the following information: patient, provider, date of service, a coded description of the exact service(s) provided, and a list of codes related to the diagnoses that pertain to the service(s) on the claim. Medicaid is able to use the eligibility data at its disposal to identify the age, sex, place of residence, and eligibility category of the recipient listed on the claims.

While claims data can provide a considerable amount of information, the ideal EHR system would accurately describe the health status of the individual. Claims data lacks clinical detail information such as past medical history, immunization records, or the results of laboratory tests and x-rays. This missing information, which may be available through the future integration of a HIE, can be important in certain decision support applications. Consider the example of Type II Diabetes Mellitus as a way to illustrate the differences between the level of information available through claims data and the clinical information contained in an EHR-based system.

Providers can submit claims using any one of 20 different diagnosis codes that can be used to precisely describe Type II diabetes. These different codes describe conditions, including complications that the provider has diagnosed, that are already present. While this information can be very useful, the key long-term health policy question in terms of Type II diabetes is what is likely to happen to these patients in the coming months and years. A diabetic that is well controlled is likely to have far fewer medical problems than a diabetic who is poorly controlled. The cost of the medical services used by the well-controlled diabetic is also likely to be much less than that of the poorly controlled diabetic.

However, claims data alone provides absolutely no insight into whether or not a given individual or group should be classified as well controlled or poorly controlled. This means that claims data provides no direct way to accurately predict future costs for care of patients with Type II diabetes. Perhaps most importantly, claims data provides no straightforward way to identify those individuals who would benefit most from more effective management of their disease.

The fundamental value proposition in medical care can be defined as purchasing the maximum health benefit possible for a given level of cost. Since claims data provides – at best – only an indirect measure of health status, claims data alone is often unable to address key questions concerning health status. This fact limits the usefulness of claims data as a decision making tool in the fundamental value proposition. While HHSC's data is limited, during the past several years, HHSC has worked to improve its data analysis capabilities by using Cognos Reporting Tools to develop a comprehensive, decision support system for data across the Health and Human Services system. The fundamental value proposition of EHR systems as they relate to Texas Medicaid will be discussed further in the Gap Analysis section of this report.

Private Initiatives

Clinician-Level EHR Systems

The term "clinician" refers to health care professionals who engage in direct patient care, including physicians, nurses, psychologists, and others. Clinicians derive their compensation from the care they provide to patients. Clinician-level EHR systems are designed to meet the clinical and business needs of these health care professionals. Such systems typically are able to assist the clinician in their professional and business activities by recording, storing, and manipulating information obtained by the clinician in the course of their encounter with the patient. This information includes:

- patient demographic data (name, age, contact information, etc.);
- past medical history (e.g., medication allergies, surgeries);
- reason for present visit (e.g., annual physical versus new illness);
- vital signs (height, weight, blood pressure, etc.);
- physical examination (clinician examination of lungs, heart, etc.);
- ordering ancillary services (e.g., laboratory studies, medical imaging);
- medical decision making (what is the clinician's opinion regarding the condition and needs of the patient); and
- automated prescribing aids.

Clearly, EHR systems can help organize and manage clinical data. These systems are widely believed to have the potential to improve preventive health care and better manage chronic disease by integrating the use of evidence-based best practices into day-to-day clinical decision-making and treatment. However, the effectiveness, scope, and provider acceptance of this type of EHR function varies widely from application to application.

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Physician EHR Adoption Rates

Most statistics point to modest but growing rates of EHR use on the part of physicians and hospitals, with one estimate indicating 14-28 percent of physician practices and 13 percent of hospitals having EHR systems.[17] The reasons for these modest adoption rates of EHR systems include cost, perceived disruption of clinical workflow and decision-making processes, a variety of technical and system compatibility issues, and issues surrounding security and privacy.

Locally, in the fall of 2005, the Texas Medical Association together with the Texas Medical Foundation Health Quality Institute evaluated physician practices in Texas and their implementation of EHR systems. Some of the key findings from the survey were:

- Twenty-seven percent of physicians are currently using some form of EHR system.
- Almost half of all physicians (46 percent) are planning some form of EHR system implementation.
- More than a third (36 percent) of physicians who have implemented some form of EHR system are extremely satisfied, and another half (48 percent) are somewhat satisfied.
- Physicians who do not plan to implement any form of EHR system report the cost to be prohibitive and state they would need the prospect of a grant in order to reconsider that decision.

2005 TMA Special Survey – Electronic Medical Record System Implementation
These 2005 studies are generally consistent with, and show a slight growth, when compared to a 2004 American Academy of Family Physicians survey of member data that reported 23 percent of respondents using an EHR system; 81 percent reported interest in EHR software, and 61 percent reported cost as the reason for not purchasing. It is noteworthy that in the 2004 survey at least 264 different EHR software programs were in use and only 0.4 percent of the respondents used the same EHR software.[18] However, these surveys only addressed clinician-level EHR systems. The EHR systems surveyed did not necessarily connect with other health care units, nor accrue benefits to payors.

In 2005, a Family Practice Management survey of 408 family practitioners reported use of 77 distinct types of EHR systems. These systems ranged from small to large vendors and included one-of-a-kind systems developed by large institutions. Eleven different commercial EHR system vendors accounted for greater than 60 percent of the systems in use by respondents. Respondents were asked to address: (1) functionality (e.g., chart review, laboratory results reporting), (2) ease of use (e.g., note creation, options, speed), and (3) on-going support and service by the vendor.

Survey respondents most commonly cited insufficient resources and a perceived lack of evidence for a positive ROI as barriers to EHR adoption. Staff training demands and changes in working practices were also important. Respondents also expressed concern that health insurance

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[17] HHS Fact Sheet—HIT Report at a Glance, "The Decade of Health Information Technology: Delivering Consumer-centric and Information-Rich Health Care".
[18] Valdes, Ignacio M.D. et. al. "Barriers to Proliferation of Electronic Medical Records". Informatics in Primary Care. 2004; 12:3-9.

reimbursement policies do not recognize or reward the efficiencies and improved care made possible by EHR systems.[19]

Some physician practices report very favorable results. The Ogden Clinic in Ogden, Utah, is a multispecialty clinic with 31 physicians and 23 mid-level practitioners in eight locations. This clinic reports that their integrated EMR and practice management systems have made a million-dollar difference. The clinic's director of operations, Ray Brock, stated, "…the last time I looked, the return on investment was slightly over $90,000 a month in increased revenue and decreased expenses".

The Ogden Clinic claims to have eliminated 95 percent of transcriptions; saved $255,000 per year in staff and chart costs and $30,000 per year from eliminated paper receipts, forms and labels; and increased annual revenue by $180,000 from increased family practice visits due to complete documentation. The improved documentation allows for more advantageous coding and billing practices.[20]

<u>Hospital and Healthcare Networks</u>

Healthcare networks provide EHR system interconnectivity within a well-defined group of users who share common clinical and business needs. Large hospitals or hospital networks are the most common examples of vertically integrated EHR systems. These EHR systems typically integrate clinical and business functions related to facility's laboratory, pharmacy, radiology, physician order entry, and delivery of nursing care. The most complete integrated systems interconnect physician practices with the hospital.

According to a 2005 Rand study, the overall EMR adoption rate, as defined by a contractual commitment to adopt, was between 20-30 percent for hospitals. Rand also noted that the rate of adoption is growing more in non-profit healthcare organizations than for-profit hospitals. This difference suggests that the largest barrier to adoption may be the lack of a credible business case rather than lack of access to capital. Rand recommends that policy options must include incentives to galvanize both for-profits and non-profits and should improve the business case for HIT adoption.[21] Listed below are some examples of Texas-based institutions that are in various stages of implementing network-wide EHR systems.

- Dallas/Fort Worth -Texas Health Resources (Harris Methodist, Presbyterian, and Arlington Memorial hospitals)
- Houston – Memorial Hermann Hospital and the Harris County Hospital District
- Austin – Seton Healthcare Network
- Midland – Midland Memorial Hospital

These systems are described in more detail in Appendix B.

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[19] Adler,K.G. and Edsall, RL. "An EHR User-Satisfaction Survey- Advice From 408 Family Physicians". Family Practice Management. Vol.12 No. 9 Oct. 2005 p.29 ff.

[20] EMR Advisor "Integrated EMR and practice management net Ogden Clinic more than $1M annually". Vol.3. No.1, Jan 06, pp.5-7.

[21] RAND Health. "The State and Pattern of Health Information Technology Adoption". By Kateryna Fonkych and Roger Taylor. RAND Corporation 2005.

Regional Health Information Networks (RHIOs)

In June 2005, the Texas Health Institute (THI) began its Shared Vision for Health Care in Texas Project (SVP). The SVP information technology workgroup defined a RHIO as:

"An independent entity that provides and supports data, communications, and other technology capabilities that facilitate multiple healthcare entities - insurance payers, government-sponsored payers, employers, physicians, institutional providers and patients – within a specific geographic area to share or exchange and communicate client, clinical and payment information".[22]

The Health Information and Management Systems Society (HIMSS) defines a RHIO as a "multi-stakeholder organization that enables the exchange and use of health information, in a secure manner, for the purpose of promoting the improvement of health quality, safety and efficiency".[23]

As of September 2005, the THI reported that there were more than 200 regionally based HIT efforts throughout the U.S. Their activities are generally sponsored by a combination of providers, business coalitions, health plans, or government-related entities within a given region. However, many of these regional organizations represent specific groups with specific goals; e.g., county health departments or emergency departments. Thus many of these 200 efforts do not fully meet the RHIO definition and are termed "RHIO –Lite" in some sources of literature.[24]

There are some evolving efforts at starting RHIOs in Texas, most notably Southeast Texas Health System's miRHIO ("my connected healthcare community"). MiRHIO connects up to 200 physicians and six facilities in six counties via a web portal which enrolls 20,000 patients in the region. Patients are issued chip-embedded patient data cards containing a summary of their essential health information including current demographics, insurance eligibility, medical conditions, allergies, medications, and lab results. Providers, including physicians, hospitals, ancillary, and emergency departments, update the card after each visit. The project is financed through membership dues, product lines, and grants.[25] For additional examples of HIE initiatives in Texas, see Appendix C.

Electronic Health Records – Tomorrow's Promise: Benefits and Challenges

Potential Benefits

Increase Patient Safety

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[22] Texas Institute for Health Policy Research – Shared Vision Project. Regional Health Information Organizations: State of the Industry. Final Report. September 30, 2005.
[23] Richards, Fred. "Mission RHIO" a White Paper - Healthcare Transaction Processors, Inc. Jan. 2006.
[24] Texas Institute for Health Policy Research – Shared Vision Project. Regional Health Information Organizations: State of the Industry. Final Report. September 30, 2005.
[25] Calhoun, Shannon S. E.D. "miRHIO – My Connected Healthcare Community Southeast Texas Health System". Presentation to HITAC July 7, 2006.

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EHR systems may significantly improve the quality of care by identifying duplicate therapies and avoiding errors due to poor handwriting or transcription errors. Valuable clinical care prompts can be integrated into EHR systems. Computerized Physician Order Entry (CPOE) can incorporate evidence-based standard order-sets for major diagnoses or disease conditions to promote the use of clinical best practices. CPOE systems are intended to prompt physicians to prescribe comprehensive, evidence-based pharmacological treatment plans and alert caregivers to potential drug-to-drug interactions and drug allergies.

Decrease Duplication of Services

In some cases, physicians order duplicate diagnostic tests simply because they are not aware that they have already been performed, or because the results of those tests are not available in a timely fashion. EHR systems that are able to display the results of the entire range of diagnostic tests should decrease unnecessary duplication of services. This could be one of the most important cost savings advantages of widespread use of EHR systems.

Promote Evidence-Based Best Clinical Practices

EHR-based protocols can reduce unwarranted variations in the way physicians and other providers manage diseases. This can be accomplished by linking standardized physician orders with diagnoses; generating automated performance reports; and standardizing diagnostic testing, development of treatment plans and the provision of therapy using evidence-based best practices.

Provide Portability and Continuity of Care

Modern healthcare typically requires coordination of multiple specialists, diagnostic services, and treatments. EHR systems promise to vastly improve this coordination by improving the sharing of pertinent clinical information. This would greatly enhance patient care by allowing up-to-date health care information to be shared across the continuum of care by all care providers. One obvious and exciting possibility would be a portable information system that individual patients could carry with them from one health care provider to another. Portability can be provided, for example, from either a central server or from a smart card product.

Improve Administrative Decision Support

Administrators and medical and quality assurance directors can better identify departmental services, resource utilization, disease, and safety issue trends.

Provide Remote Access

Providers can easily access their patients' real-time clinical and administrative information regardless of where the provider is physically located when the need arises.

Effect on Healthcare Costs

U.S. health care costs continue to rise faster than the overall rise in the cost of living. The rate of cost increase in health care is an area of concern for public and private policy planners. In this

context, there is a natural enthusiasm for measures that hold the potential to control or decrease costs while maintaining access to health care. Advocates often contend that EHR systems are not only indispensable tools for accomplishing these goals, but will simultaneously improve the quality of health care as well. However, there is not yet any direct proof that widespread use of EHR systems will, in fact, reduce the overall cost of health care. A 2006 July/August edition of *Health Affairs* claimed that EHR often leads to higher billing and declines in provider productivity with no change to provider-to-patient ratios. [26] Absent additional interventions altering medical practice, it is unlikely that U.S. health care costs will decline due to the EHR alone.

Health care utilization and costs could trend upward if EHR systems optimize health care providers' clinical and business practices. This is because EHR systems' clinical decision support functions will prompt physicians to order or provide all of the services that are indicated for a given clinical situation and the business support functions will, hopefully, optimize provider billing practices. Net decreases in health care costs would result only if EHR systems create significant offsetting efficiencies, such as avoiding duplication and provision of unnecessary services, or by decreasing the disease burden of populations in a manner that reduces the overall cost of care.

Improved Health Status – Individuals and Populations

The clinical decision support, evidence-based best practice protocols, and patient safety features of EHR systems promise to allow physicians and other health professionals to efficiently provide optimal care. EHR systems must be designed to automatically incorporate proven innovations and improvements in medical science. EHR systems will greatly speed up the diffusion of new scientific knowledge and medical practice guidelines throughout the health care infrastructure. Without doubt, if best clinical practice protocols can be effectively implemented, their use will enable many additional health care professionals and patients to avail themselves of the state-of-the-art care options. That is indeed a welcome prospect. However, patient compliance with prescribed plans of care must also improve. This is perhaps most challenging when adherence to healthier lifestyles must take place before there can be cost of care savings gains for major chronic diseases linked to lifestyle choices (e.g., obesity, alcohol consumption, and smoking). The 2006 *Health Affairs* article noted previously also cites other published studies that demonstrate that professional providers who use EHR systems often ignore the "best practice" prompts they contain.[27] Moreover, when these prompts are followed, the cost of per quality-adjusted life year (QALY) can dramatically increase for certain chronic diseases such as coronary artery disease and hypertension – up to $10,000 and $50,000 per QALY respectively.[28]

Challenges and Gap Analysis

Technology

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[26] Hillestad, Richard, Bigelow, J. et. al. "Can Electronic Medical Record Systems Transform Health Care? Potential Health Benefits, Savings and Costs". Health Affairs. Vol.24, Issue 5, 1103-1117, 2006.
[27] Hillestad, Richard, Bigelow, J. et. al. "Can Electronic Medical Record Systems Transform Health Care? Potential Health Benefits, Savings and Costs". Health Affairs. Vol.24, Issue 5, 1103-1117, 2006.
[28] K. Kiewra, "What Price Health?" Harvard Public Health Review, Fall 2004.

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We must all communicate in the same language if we expect to communicate effectively. Until national standards and certification criteria become established via DHHS' Office of the National Coordinator and the American Health Information Community and until there is a determination made on the underlying technology architecture, it may be premature for states to invest heavily in statewide interoperable EHRs/EMRs via incentive programs or via variable-rate reimbursement methods.

The fact that there are currently no certification standards for EHR software contributes largely to physician resistance in adopting EHR systems. These concerns are coupled with security/privacy concerns and interoperability. The interoperability must exist between acute care facilities and physician practices as well as between labs and pharmacies, all while remaining comprehensive and current. Until these capabilities exist, demand for EHR adoption will remain low.

Debates surrounding clinical data messaging include potential use of standards such as HL7, Logical Observation Identifiers Names and Codes (LOINC®), RxNorm and involve organizations such as, the National Council for Prescription Drug Programs (NCPDP), Institute of Electrical and Electronics Engineers, Inc. (IEEE), or the Digital Imaging and Communications in Medicine (DICOM). Some primary groups included in the standards debate are the International Organization for Standardization (IOS) Technical Committee, HIMSS, and the National Committee on Vital and Health Statistics (NCVHS). It is unclear at this time which technical standards will be officially adopted. The Standards Developing Organization (HL7), accredited by the American National Standard Institute (ANSI), presently appears to dominate in the standards debate. HL7's Reference Informational Model, Clinical Document Architecture, Templates, and Vocabulary groups may produce tools to construct an interoperable EHR once the ONCHIT determines the national requirements.[29] Much of the problem with standards however, appears to be the simple definition of an EHR. Is it a current clinical snapshot or a longitudinal record with episodic and/or historical information on a patient? This debate is ongoing.

An eHealth Initiative Survey in May 2005 involving 109 respondents (mainly regional health exchanges) substantiated the rise in HIE. Forty respondents were in the implementation phase and 25 were fully operational. Fully operational HIE efforts increased from nine in 2004 to 25 in 2005.[30] This study reported, that of the advanced stage respondents, 76 percent used the HL7 technology standard for messages and 41 percent reported using the LOINC standard for lab reporting.

It is not clear how claims data can best be utilized and integrated in EHRs. Many hospitals and healthcare networks have already invested in EHRs through either commercial software vendors or the less costly OpenVista federally subsidized software. Additionally, many physician offices have implemented the same variety of software. When and if the state chooses to connect these disparate systems with RHIOs or other regional hubs, still remains unanswered. Primarily, how will the Texas Medicaid programs create equitable incentives without penalizing those providers

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[29] Larsen, Ed. HIMSS Standards Insight. April 2003, pp. 4 and 5.
[30] Marchibroda, Janet and Jennifer Covich-Bordenick. Emerging Trends and Issues in Health Information Exchange. EHealth Initiative paper, 2005.

who cannot yet afford EHRs? Or rather, how will the Medicaid program retain rural and urban providers to serve our state's medically needy population? These are all issues that must be resolved.

Organizational/Financial

Buy-in from providers and their staff is a persistent challenge. Clinicians, already overworked, are reluctant to embark on new operations that require huge learning curves and require additional time and effort. Implementation costs are high initially for capital investments such as hardware/software and personnel training costs, in addition to ongoing operating costs. These factors slow the rate of EHR system adoption.

Some published studies sound important cautionary notes regarding EHR systems. A study performed at Kaiser Permanente and published in the 2005 *British Medical Journal,* reported a five to nine percent decrease in office visits, which were replaced by phone contacts after Kaiser implemented an EHR system.[31] Another study published in 2005 in *Pediatrics* documented an unexpected increase in mortality in a pediatric intensive care unit that was attributed to delays and miscommunications caused by the implementation of a new EHR system for the unit.[32]

However, the question of ROI is perhaps the most central and most difficult question of all. Purchasing, implementing, operating, and upgrading EHR systems will require substantial capital investment. Insufficient funds and perceived lack of evidence for a positive ROI are the most commonly cited barriers to the adoption of EHR systems. For thoroughly automated hospitals, declining costs and positive ROI are typically realized no sooner than three to five years after adoption.[33]

It is especially important to note that incentives to invest in EHR systems are neither well aligned nor evenly distributed across the full range of stakeholders or potential beneficiaries currently doing business in the health care delivery infrastructure. For example, physician practices often express the concern that their high-stakes investment in EHR systems will provide an unearned windfall for other players, especially health care payors and government regulators. However, there is no clear evidence to support these commonly expressed concerns.

HIPAA does provide a striking example of how public mandates can provide effective incentives for significant changes in health care information technology. Payors and providers rapidly modified their systems once CMS made clear to the industry that nearly all business transactions that involve health care information must comply with the standards promulgated by HIPAA. The financial incentives for HIPAA compliance were significant across the entire health care delivery system.[34]

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[31] Garrido, T. et. al., "Effect of Electronic Health Records in Ambulatory Care: Retrospective, Serial, Cross Sectional Study," British Medical Journal 330 no. 7491 (2005): 581.

[32] Han, Y.Y., et. al., "Unexpected Increased Mortality after Implementation of a Commercially Sold Computerized Physician Order Entry System," Pediatrics 116, no. 6 (2005): 1506-1512.

[33] Borzekowski, R., "Measuring the Cost Impact of Hospital Information Systems: 1987-1994," Washington D.C.: Board of Governors of the Federal Reserve System, September 2002b.

[34] Glaser JP, DeBor G, Stuntz L. The New England Healthcare EDI Network. Journal of Health Care Information Management. 2003; 17:42-50.

Some providers express concerns about how information technology could alter the role of the medical professional in care delivery or disrupt established workflow. Other concerns include the increased time needed to enter data and the potential for a system to have limited usability at the point of care. "These [current systems] are disaggregated, disconnected, pieces of information technology, and what [medical professionals] want is an integrated system into which the information and workflow components fit".[35]

The Markle Foundation estimates that to spur adoption of EHR systems by small and medium-sized practices, payers would have to offer substantial financial incentives able to cover most of the initial costs of a start-up system. In 2004, the Markle Foundation estimated the incentive would need to range from $12,000 to $24,000 per full-time physician.[36] Other approaches could include professional organization sponsorships of HIT discounts for their members. For example, the American Academy of Family Practice is partnering with 11 vendor companies as a part of a national demonstration project to provide 15 to 50 percent discounts on HIT products and services to encourage family practitioners to have an EHR system for their practice location.[37]

Naturally, the owner of the capital expects a return on their investment. However, how and when that return can be expected varies depending upon the entity that makes the investment. Table B below presents a very high level summary of the business model for ROI in EHR systems in the present-day health care environment. The categories across the top list the anticipated benefits of effective, widespread use of EHR systems. The vertical headers indicate potential sources of capital for EHR investment. The comment in each box indicates whether or not the anticipated EHR benefit will contribute to the positive ROI of each type of investor.

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[35] Jackson K. "What's Holding Up the EMR? Barriers to the Universal Adoption of Electronic Medical Records," For the Record. 2004:16(4)30.
[36] Connecting for Health-The Markle Foundation. "Financial, Legal, and Organizational Approaches to Achieving Electronic Connectivity in Healthcare". October 2004.
[37] Adler K.G. and Robert Edsall. "Why it's Time to Purchase an Electronic Medical Record System –Principles of Group Purchasing Agreements". Family Practice Management. Nov/Dec. 2004 p.43.

Table B
ROI Mechanisms for EHR System Investment

Source of EHR Investment Capital	EHR Will Generate ROI by Increasing Revenue to the Investor	EHR Will Generate ROI by Decreasing Operating Costs for the Investor	EHR Will Generate ROI by Decreasing Demand for Services or Significantly Improve Health Status	EHR Will Guide Service Array or Coverage Policy Decision Making	ROI Can Be Expected in Near Term	ROI Can be Expected in Long Term
Individual or Group Physician/Provider Practice	Yes	Yes	No	Maybe	Yes	Yes
Hospital System	Yes	Yes	No	Maybe	Yes	Yes
Commercial Insurance Payor	No	Maybe	Maybe	Yes	Maybe	Yes
Governmental Program Health Care Payor	No	Maybe	Maybe	Maybe	Maybe	Yes

Security

The patient's identity and the user's identity are key, and the patient will need to know who is accessing their data. Consumers are concerned about security of information. Fears of unauthorized access to and use of EMR systems continue to be a significant barrier to EMR adoption. Ensuring HIPAA-compliant EMR systems will help drive automation. Breeches in information systems have alarmed patient advocates regarding the potential for third-party organizations, such as employers and health insurance companies, to have increased access to patient information.

If a portable medium such as a smart card is adopted, access and security issues may multiply. As is true of any form of electronic patient information, protections are needed to safeguard this data against loss, damage, hardware failures, intentional manipulation, identity theft, and other events that could adversely affect the integrity of the records and make the data unreliable for patient use.

Governance/Ownership

Ownership rights to the information contained in EHR systems will continue to be an important issue, even after EHR technical standards have been defined. Many important questions are still unanswered. Historically, a physician's office owned a patient's medical documentation and a hospital's Medical Information department owned documentation related to medical care provided in that facility. The cost of generating and managing these records was borne by the entity doing the documentation. However, when the day comes that EHR systems are widely

implemented, who will own the medical record and who will bear the costs of the EHR system when the information is transferred electronically from place to place, from healthcare provider to healthcare provider? How will the official "original" medical record be defined and where will it reside? Will individual patients be entitled to share in the ownership rights of their medical record? These questions must be resolved before the potential use of EHR systems can be fully realized, since the answers will affect every potential user of the system and every patient in it. The cost of doing business with an EHR system clearly affects its net value to its users, including publicly financed health care programs such as Medicaid.

The issue of ownership of EHR data is even broader than the issue of the ownership of Protected Health Information (PHI) in the form of the identifiable medical and health records of specific individuals. Aggregated data extracted from advanced EHR systems will have tremendous economic value even when that data has been stripped of all of the information that could be used to link the information to specific individuals. Aggregated data derived from large EHR systems could determine not only the number and distribution of Type II diabetics in the database, but also determine the number and distribution of patients whose disease is poorly controlled. This sort of detailed picture of the disease burden in a given population would have value to a range of potential customers: physician group practices, medical suppliers, pharmaceutical manufacturers, hospital systems, public health officials, and health care payors, both public and private. Who will be entitled to compensation for use of this data, especially use by entities not directly involved in the clinical care of the patient?

Bridging the Gap

Taking the Lead

Texas has already initiated the first steps in addressing the challenges posed by EHR systems by convening the public/private Health Information Technology Advisory Committee (HITAC), which is designed to develop recommendations and a preliminary roadmap pointing the way to wider adoption of EHR systems and a broader Texas HIT strategy across the state. The state can also catalyze EHR through assisting in the development of a business model by organizing efforts intended to quantify the financial and clinical benefits associated with investment in EHR systems.

There is also the very important question of direct investment of state funds for the purpose of promoting widespread adoption of EHR systems. There are two basic approaches: (1) the "good public policy" approach or (2) the "return on investment/business case" approach.

The "good public policy" case for investing state funds to promote EHR systems is simple: such an investment would provide value by jump-starting the modernization of the health care infrastructure and improving health care for patients across the state. If policy makers deem that such an investment is self-evidently in the public interest for these reasons, then the only remaining question would be how much to invest and where. In the "good public policy" approach, there is no expectation of a quantifiable net financial advantage to the investment.

The "return on investment/business case" is far more challenging. In this approach, the state would have to determine how, when, and to what degree capital invested to promote EHR systems would provide net financial advantage to the state. The logical place to look for those returns would be in the form of lower costs to large, publicly funded health programs such as Texas Medicaid.

ROI for Medicaid would need to arrive in the form of significant reduced demand for services by the Medicaid eligible population - due to reduced duplication of services, or improved health status– resulting in an overall decreased demand for health care. If these beneficial effects come to pass, they will most likely come about only after a robust, interoperable EHR has been in widespread use for some significant length of time by a large majority of Medicaid providers. It is unreasonable to expect that isolated implementation of EHR systems will reduce unnecessary duplication of services or improvements in the health status of large populations unless robust, interoperable, and interconnected EHR systems have been in play over an extended period of time.

Implications for Texas Medicaid and CHIP

What is the proper role of Texas Medicaid in the evolution of the EHR implementation across the state? Viewed broadly, the options range from passive observer to active investor.

Objectively speaking, the passive observer stance makes sense if policy makers deem that widespread EHR use is inevitable in the reasonably near-term and that the Medicaid program will eventually enjoy all of the cost savings benefits without need of risking any investment. Conversely, the active investor stance makes sense if there is convincing evidence that investment of public funds on behalf of Medicaid will result in a positive ROI, or if such investment is deemed to be good public policy in its own right and no demonstration of ROI is required.

The following section will discuss specific options in the light of these two ends of the policy spectrum.

Encourage Use of Existing EHR Resources

Medicaid could adopt policies intended to improve the usefulness of ImmTrac, BHIPS, or other state registries - systems that the state has already created and is currently funding. If ImmTrac were optimally populated with immunization data, there would be a clear opportunity to avoid duplicate immunization and thereby reduce the overall cost of these services. Archiving records for individuals beyond their 18th birthday may significantly enhance the value of ImmTrac. This could prove especially useful in response to a widespread outbreak of a vaccine-preventable disease, e.g., influenza or mumps. Medicaid could research the feasibility of providing financial rewards to providers who populate ImmTrac with immunization data.

Reward or Subsidize Provider EMR/EHR Implementation

One policy option would be for Medicaid to invest directly in the EHR implementation process by providing enhanced reimbursement rates to providers who already have or will adopt EHR systems. While this seems quite straightforward, there are significant unanswered questions. Foremost among these questions is whether or not the federal government would allow additional federal matching dollars to be used for this purpose. While CMS has expressed strong support for the concept of widespread EHR implementation, CMS has yet to provide specific direction on how this goal can be accomplished within the highly regulated structure of the federal-state Medicaid partnership.

Given the large number of Texas Medicaid providers, it also would require additional administrative resources to determine and monitor which providers qualify for enhanced EHR reimbursement. Finally, since a typical clinical office-based EHR system may cost from $30,000 to upwards of $50,000 per provider to implement, it is not clear that modest changes in Medicaid reimbursement rates would influence providers' business decisions in any meaningful way.

Conclusions

This report documents that the widespread implementation of electronic medical records is gaining momentum. The federal government and the information technology industry are making rapid strides in a partnership that is intended to result in industry standards for interoperability and system architecture. Clinical service providers, most notably hospitals and group physician practices, are increasingly accepting the business argument that investment in EHR systems yields a positive return on investment.

The public policy case in favor of widespread EHR implementation points to the promise these systems hold to improve safety, convenience, and efficiency across the entire health care industry. The case in favor of EHR systems will become even more compelling if it is shown that these systems prove effective in significantly improving the health status of entire populations.

However, hope that the widespread use of EHR systems will reduce the overall cost of health care has yet to be rigorously demonstrated by empirical evidence. Moreover, there is still no clear and widely accepted consensus regarding what sectors of the health care system should be expected to secure the capital needed to purchase and implement EHR systems on a large scale.

As a result, two basic policy approaches present themselves. If policy makers conclude that direct investment of funds in promoting EHR systems is good public policy in its own right, then they need to determine when and how funds should be dedicated to toward this end. On the other hand, if public policy makers deem it more prudent to adopt the business case, then investment of public funds will proceed only after the marketplace has provided empirical evidence that large publicly financed medical assistance programs can expect a timely and significant return on that investment.

This report was prepared by the
Health and Human Services Commission
Office of Medical Technology

The Office of Medical Technology (OMT) was created by S.B. 1188, 79th Legislature, Regular Session, 2005. The mission of the OMT is to explore and evaluate new developments in medical technology and propose implementing the technology in the Medicaid program if the technology is appropriate and cost-effective. Contact Information: HHSC Medicaid CHIP Division, Medical Director's Office, John Hellerstedt, M.D.,(512) 491-1325, John.Hellerstedt@hhsc.state.tx.us.

Appendices

Appendix A
Public Initiatives: Other States

Indianapolis Health Information Exchange (IHIE)
One of the oldest in the nation, IHIE is funded by the Regenstreif Institute (a private, not-for-profit research leader in medical informatics and health services research) with some start-up funds from Biocrossroads and the Fairbanks Foundation. The IHIE's ongoing support was obtained by payments from data sources, which benefited from using electronic transfer of information versus paper-based models.[38]

Through creating economies of scale, IHIE analyzed data and discovered the cost was 80 cents per clinical laboratory result for a hospital to deliver to a doctor's office using paper-based models. In contrast, IHIE claims that the electronic transfer delivers the information at a lower cost, saving hundreds of thousands of dollars each year for each data source.

Vermont Information Technology Leaders (VITL)
Vermont initiated its HIE through state seed funding. However, Vermont still experiences funding sustainability challenges. VITL is actively pursuing public and private grants and is also considering a subscriber-financed model.

VITL representation includes physician groups, employers, and state payers such as Medicaid, along with state and regional quality organizations, patients/consumers, public health, and regulatory entities. At the time of writing, the VITL committee is attempting to develop an implementation strategy and select a technology solution.[39]

Tennessee: MidSouth Health Alliance
The Agency for Healthcare Research and Quality (AHRQ), along with the state of Tennessee and Vanderbilt University, funded the MidSouth Health Alliance to implement a pilot and a future broad alliance. Data exchange is to begin October 2006.[40]

AHRQ donated $5 million to MidSouth as one of their five regional demonstration programs. Mark Frisse, M.D., Director of Regional Health Initiatives for the Vanderbilt Center for Better Health and Program Director for the MidSouth Alliance, states that the MidSouth Alliance receives strong participation from the state's senior leadership and from regional political leaders. Frisse lists some items as remaining challenges: (1) fears about security, (2) legal and organizational concerns, primarily legal consensus between institutions, and (3) diverse stakeholders.[41]

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[38] eHI Connecting Communities Toolkit. Indianapolis Health Information Exchange. February 2006. <http://toolkit.ehealthinitiative.org/
[39] eHI Connecting Communities Toolkit. February 2006. <http://toolkit.ehealthinitiative.org/
[40] eHI Connecting Communities Toolkit. February 2006. <http://toolkit.ehealthinitiative.org/
[41] eHI Connecting Communities Toolkit. February 2006. <http://toolkit.ehealthinitiative.org/

California: CalRHIO

CalRHIO was launched in January 2005 as a collaborative effort with support from Kaiser Permanente, Sutter Health, Blue Shield of California Foundation, and the Wellpoint Foundation, with funds totaling over $5 million. CalRHIO was created to link various regional RHIOs by providing the infrastructure and financial support for a statewide electronic "spine" of healthcare information. Initially, the organization began as a program operated by San Francisco's Health Technology Center and CEO Molly Coye, but it is currently in the process of transition into an independent nonprofit organization.[42]

Some of CalRHIO's short term projects/pilots include linking hospital emergency departments, defining necessary infrastructure for statewide health data exchange, supporting enhanced medication management safety, improving administrative efficiency for health plans and providers, and giving consumers more direct access to information in the form of a personal health record. The goal is to connect 80 to 90 percent of California consumers and authorized health information users within a decade.[43] In April 2006, CalRHIO published a data-standards road map intended to guide state health care organizations on sharing patient information; this will be updated periodically to reflect evolving national standards.[44]

Massachusetts eHealth Collaborative

Blue Cross Blue Shield has invested $50 million in funding into the Massachusetts eHealth Collaborative, a private non-profit group founded by insurers, doctors, and others with an interest in the healthcare industry. The pilot initiative started two years ago and will purchase computers for doctors and hospitals in three communities – Newbury, Port Brockton, and North Adams. The plan expects to eventually implement across the entire state and will use the pilot projects to better define the barriers to adopting EHRs. The group plans to have 200 offices wired by next year.[45]

The state initiatives and collaboratives mentioned above are experimental or rather, demonstration projects attempting to identify and/or develop an optimal model or practice. In fact, a Health Data Management newsletter mentions a report by Avalere Health, funded by AHRQ, recognizing that of eight state-level HIEs recently examined, none had achieved any sustainable funding to maintain or expand their respective HIE projects.[46] Appendix B describes the established health information exchanges in the U.S and Texas that may exist on a provider/physician level or on a healthcare network level.

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[42] Rauber, Chris, "Bush Official Lauds California Health-Tech Plan", San Francisco Business Times, March 1, 2006.
[43] IhealthBeat.org interview. Special Audio Report: HealthTech CEO Molly Coye Discusses California RHIO Progress. October 11, 2005.
[44] Moore, John. "CalRHIO Publishes Data Standards". Government Health IT. April 10, 2006.
[45] Powell, Jennifer. "Docs Link Up to New Record Style". Boston Herald.com March 17, 2006.
[46] Health Data Management News Release, May 11, 2006.

Appendix B
Private Initiatives: Texas Hospitals/Healthcare Networks

Texas-Based EHR Systems

Dallas/Ft. Worth Area

Texas Health Resources (THR):
Arlington-based THR is one of the largest faith-based, nonprofit health care delivery systems in the U.S. The 13-hospital system includes Harris Methodist, Presbyterian, and Arlington Memorial hospitals in the Dallas/Fort Worth area. EHR implementation efforts began more than eight years ago, prior to their merger when each legacy organization had been working on a complete electronic health record.[47] In July 2005, the health care system was awarded as one of the three winners of the Most Wired Innovator Awards by *Hospital and Health Networks*, a Journal of the American Hospital Association. THR won the award based on its deployment of a web-based Safety Action Learning Tool (SALT). To date, approximately 65 to 70 percent of THR's paper documentation is produced by computer-based information systems. A physician portal is available and 62 percent of THR's medical staff use it regularly, however, information is not received from the physician offices.

Houston Area

Memorial Hermann:
Memorial Hermann is an integrated health system comprising 13 hospitals, including the Texas Medical Center and ten suburban hospitals. The system's EHR program is well underway. Today, all acute care locations are live with Electronic Medication Administration Reporting and bar-coded patient identification. All Emergency Centers document in the computer, and the emergency center charts, as well as the non-bedded outpatient visit charts, are available in the document imaging system. Many non-nursing clinicians also currently document using the EHR system. Memorial Hermann has not yet implemented nursing documentation for inpatient care, but the lab and radiology results are available through the EHR system at each site. A physician portal is also available for physicians to view results at their offices or homes. A complete phase-in for nurse documentation and CPOE/physician documentation is planned for future action. Memorial Hermann is currently about 40 percent complete with the implementation of their EHR system. When the nurse documentation and CPOE/physician documentation projects are functional, the implementation will be nearly 80 percent complete.

Over 2,000 physicians are connected electronically with Memorial Hermann's hospitals and are able to access patient records in real-time. Memorial Herman is involved with Houston area committee meetings regarding RHIOs that are conducted by the Greater Houston Alliance.

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[47] Muntz, David. Senior VP of Information Services and CIO – Texas Health Resources. E-mail interview. March 15, 2006.

Harris County Hospital District:
The Harris County Hospital District includes three area hospitals along with a variety of clinics and mobile units, serving approximately 1.2 million outpatients and 60,000 emergency department visits per year. Currently, the Harris County Hospital District is using basic EHR systems for results reporting of lab and radiology throughout all their facilities. Plans for 2006-07 include expanding to computer physician order entry and EHR functionality for inpatient/outpatient services. Implementing clinical decision support is expected during the 2007 time frame. They have no integration with other healthcare systems at this time but are actively involved in meetings for Houston area RHIOs.

Austin Area

Seton Healthcare Network:
The Seton Healthcare Network reports that 33 percent of its departments have a fully functioning EHR system. The network has implemented the first phase, which includes the clinical repository, master patient index, results viewing across the continuum of care, medication allergy alerts, scheduling, and paper medical record chart tracking. The system is live at Brackenridge, Children's Hospital of Austin, Seton Medical Center, Seton Northwest, Seton Southwest, Seton Highland Lakes, and Seton Shoal Creek. The integrated pharmacy system is on-line at Brackenridge and Children's Hospital. Phase II, which includes all acute care nursing and all ancillary documentation, will convert at Brackenridge and the Children's Hospital in summer 2006. Phase III, which includes physician clinical documentation, CPOE, Intensive Care Units, and Emergency Department will convert in fall 2006 at the Children's Hospital and Brackenridge. Other Seton sites are scheduled for phases II and III, one hospital per quarter, to be completed by 2008. Currently, all Seton clinical sites have direct-networked connectivity and all Seton credentialed physicians have access through a secure portal, which allows for accessing and entering information by physicians.[48]

Midland Area

Midland Memorial Hospital:
The Midland Memorial Hospital plans to connect three campuses with MedSphere's OpenVista software and services, which is based on the open source VistA EHR developed by the U.S. Department of VA, in use at VA hospitals. The cost of implementing OpenVistA software will be $7.1 million, half of what it would have been if the hospital had gone with commercial software. The pharmacy application went live in October 2005 and the laboratory application went live in December 2005. The hospital is moving forward with general order entry services on March 20, 2006.[49]

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[48] LeMaistre, Anne M.D. IS Medical Director, Seton Healthcare Network. E-mail Questionnaire . March 29, 2006.
[49] Martens, China. "US Hospital moving to open source medical apps". Computerworld. March 13, 2006.

Appendix C
RHIOS and Texas HIE Examples

RHIOs Technology Standards

The SVP identified two broad technical models as emerging for RHIO development – a "central" data repository model and a "distributed" data model. Those RHIOs interviewed by the SVP utilized, or planned to utilize, one of these models. It is important for the national standards for HIT exchange to support the regional models.

The centralized data repository is deployed under an Application Service Provider (ASP) through a contract with a third party. However, this model may pose security and privacy concerns along with data ownership and control issues. Organizations such as the Austin's Indigent Care Collaboration utilize this ASP model.

The distributed model is a "peer-to-peer" model in which data remains on a central server near the source location. In this model, a record locator "points" to the data location and facilitates data query retrieval.[50]

Access Medica

Access Medica plans to deploy an EHR system for use by physicians in East Texas. The RHIO will deploy the technology to 29 physicians in six independent clinics during the first regional phase, and then will include 50-60 physicians in mid 2006. The contract is valued at more than $1.4 million.[51]

Acute Care Facility Projects: TEXCITE!

TEXCITE! is a collaborative effort by the Texas Medical Association, the Texas Medical Foundation, the Texas Hospital Association, the DSHS, and the Texas Health Institute together with Johns Hopkins researchers to conduct a statewide project to help Texas hospitals improve their information systems. The TEXCITE! project, funded by The Commonwealth Fund, has the following aims.

- Assess information systems across 156 Texas hospitals using a clinical information technology assessment tool (CITAT) developed by Johns Hopkins;
- Examine hospital IT systems and their clinical/financial outcomes; and
- Share the results of a hospital's IT performance with each hospital. The results of the project will be used to provide policy recommendations to the Texas Legislature.

Clinical Information Technology (CIT) scores will be obtained from each hospital by surveying hospital chief information officers and physicians. The completed analyses will be confidential and will be supplied to each participating hospital executive with a comparison to "like" hospitals. "Beyond the specific hospital itself, no other hospital or physician can be specifically

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[50] Texas Institute for Health Policy Research – Shared Vision Project. Regional Health Information Organizations: State of the Industry. Final Report. September 30, 2005.
[51] Healthcare IT News, Physician News Briefs, February 1, 2006.

identified in these confidential reports. These quality improvement reports are only for the use of individual hospital executives and cannot be viewed by anyone else".[52]

Texas Indigent Care Collaboration (ICC)
The ICC was initially and collectively funded by approximately $2 million from the Robert Wood Johnson Foundation, the Health Resources and Services Administration's Community Access Program in 2001, and the Healthy Community Access Program in 2003. It is comprised of 18 participating organizations, or safety-net providers, including the SETON Healthcare Network, St. David's Healthcare Network, and the city health clinics to cover a three county region around Austin (Travis, Hays, and Williamson Counties). The collaborative was organized in 1997 and is now designated a Texas Uniform Unincorporated Nonprofit Association. ICC has two data systems: (1) the I-Care system, for shared health history; and (2) the Medicaider, a screening system.

I-Care is a health information exchange network for uninsured patients in the three-country area whose demographic and clinical data is exchanged among ICC's regional safety-net providers. With patient consent, clinicians use I-Care's shared health history to support management of chronic conditions and to improve clinical care. Participating sites upload to a central data repository using electronic interfaces and a Master Patient Index. The system is an internet-based model run through an Application Service Provider. Currently, the I-Care system contains over 500,000 unduplicated patients and two million encounters captured electronically from 47 locations.

The Medicaider system has screened over 256,000 people since 2002, 86 percent of which were found to be potentially eligible for federal, state, or local health funding. Over 25,000, or ten percent, have been found potentially eligible for Medicaid or CHIP. The I-Care system is currently being replicated in Houston and similar collaborative efforts are being started in San Antonio.[53]

Terry Stoller, a Cleveland Health Care Consultant, has claimed Austin as "unparalleled in its potential to affect and improve the community's health". She stated that, "Austin is doing a better job to curb hospitalizations than any other city she had evaluated".[54]

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[52] TEXCITE Project – Welch Center for Prevention, Epidemiology and Clinical Research, Johns Hopkins University School of Medicine – Project Description 2005.
[53] Kitchen, Ann. Executive Director, Indigent Care Collaboration (ICC) – E-mail/Interview. April 2006.
[54] Galewitz, Phil. "Palm Beach County follows Austin's Lead in Providing Health Care for Uninsured". PalmBeachPost.com, May 15, 2005.