

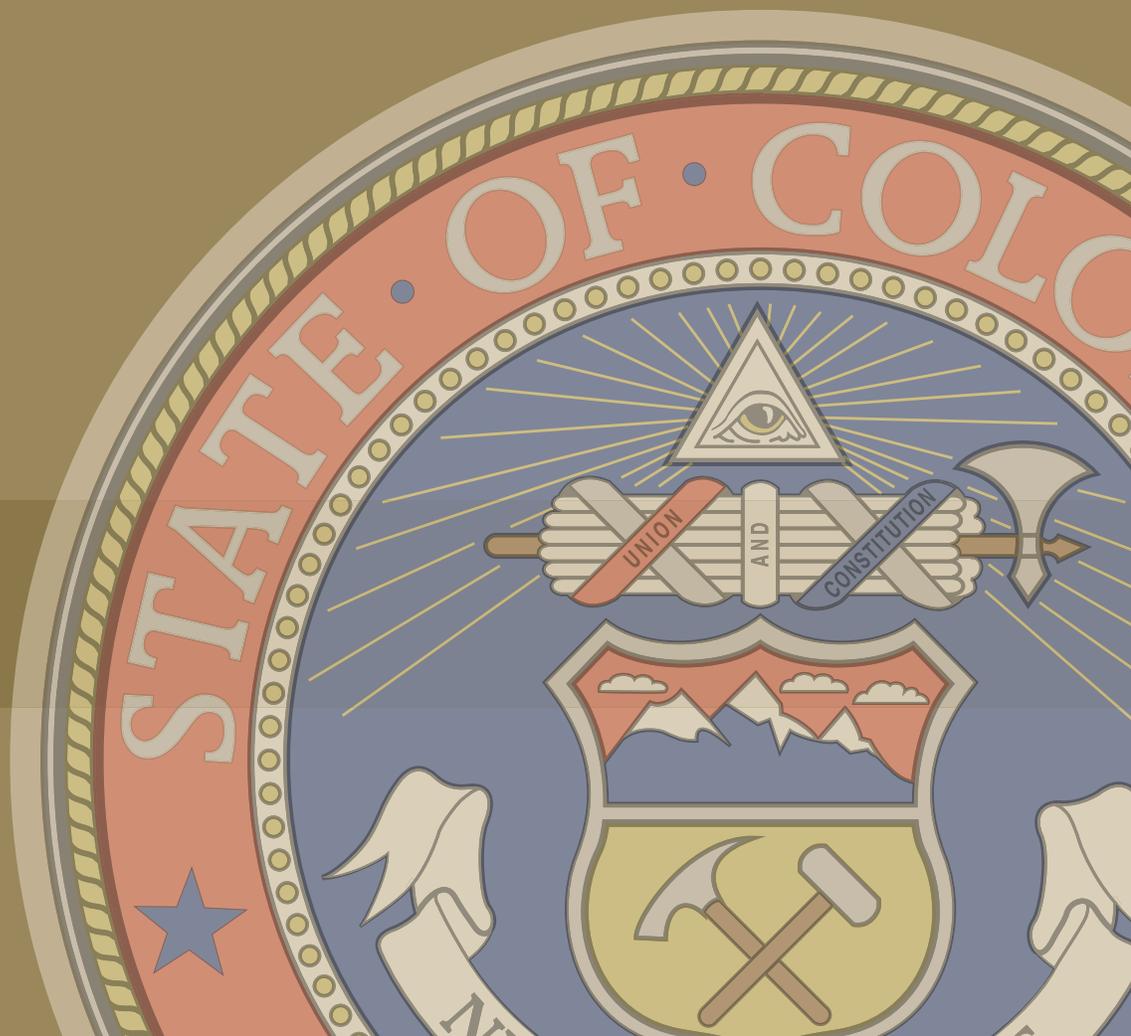


HEALTH INFORMATION TECHNOLOGY

ADVISORY COMMITTEE



Report & Recommendations
April 2009



STATE OF COLORADO

GOVERNOR'S OFFICE OF INFORMATION TECHNOLOGY

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Bill Ritter, Jr.
Governor

Michael Locatis
State Chief Information Officer

April 24, 2009

Legislative Council
Room 029
State Capitol Building
Denver, Colorado 80203

RE: Colorado Senate Bill 07-196
Health Information Technology Advisory Committee

Dear Stakeholders:

A critical component of the American Recovery and Reinvestment Act recently signed by President Obama is reforming health care through the systemic implementation of information technology. On the tides of this official enactment, it is a great pleasure to present this report from the Health Information Technology Advisory Committee to Colorado's State legislature and its citizens. This report is aligned with the new administration's objectives; and, I wish to thank the Committee for its significant efforts.

The widespread implementation of information technology throughout health care in Colorado is expected to reduce healthcare costs and improve the public well being. On behalf of the Committee, I am providing this report as an important and timely update on the issue and on our progress toward achieving State and national objectives for improving health care. The Office of Information Technology looks forward to working closely with the State legislature in furthering this critical initiative.

On April 3, 2009, Governor Ritter issued an Executive Order to take the first step in receiving funding from the ARRA and to implement an important recommendation of this Committee. The complete Executive Order is included at the end of this report.

This report may be referenced at www.colorado.gov/oit under "SB 196 HIT Advisory Committee." Thank you for your time and consideration of this report in furthering statewide health information technology.

Best regards,

A handwritten signature in black ink that reads "Michael Locatis".

Michael Locatis
HIT Advisory Committee Chair
State Chief Information Officer

ACKNOWLEDGMENTS

The Health Information Technology Advisory Committee's members were appointed by Governor Ritter and represented a variety of public and private sector interests. The following lists Committee members and the stakeholder group he or she represented. These individuals' efforts were crucial to the development of this report:

Name	Organization	Stakeholder Group
Michael Locatis Committee Chairman	Chief Information Officer, State of Colorado	Colorado Governor's Office
Geoff Blue Esq.	Deputy Attorney General	Colorado Attorney General
Mitchell Carson	Longmont United Hospital	Hospitals
Keith Clay	Colorado Department Health Care Policy and Financing	Medicare and Medicaid
Lynn Dierker, RN	State-level HIE Consensus Project, through AHIMA	CORHIO
Richard Doucet	Community Reach Center	Mental Health Providers
Bob Hagedorn	State Senator (Retired)	Colorado General Assembly
Marjie Harbrecht, MD	Colorado Clinical Guidelines Collaborative	CORHIO
Edward Havranek, MD	Denver Health	Academic Institution
James Hogan	Total Longterm Care, Inc.	Home Health Care Providers
Donna Marshall	Colorado Business Group on Health	Employers
Tom Massey	State Representative	Colorado General Assembly
Nandan Menon	Rocky Mountain Health Plans	Insurance Industry
Michael Rodriguez	John Snow Inc.	HIT Industry
Sandford Rothe	Deloitte	Information Technology Association
Alok Sarwal, PhD	Colorado Asian Health Education and Promotion	Consumers
Kathleen Traylor, MD	Amgen	Pharmaceutical Industry

The Committee would like to acknowledge the valuable contribution of the following people who also made significant contributions to this report:

Bob O'Doherty	Colorado Department Public Health and Environment	Staff Support
Lauren Plunkett	OIT HIT Project Manager	Staff Support
Steve Ward	Colorado Telehealth Network	Contributor
Christina Beck		Report Writer

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EXECUTIVE SUMMARY

Expanding Health Information Technology (HIT) across the State of Colorado has the potential to significantly reduce health care costs and improve patient outcomes. To help make this vision a reality, the Health Information Technology Advisory Committee was created in 2007 by Senate Bill 07-196. The Committee was charged with developing a comprehensive, long-term plan for HIT in the State of Colorado. Numerous issues, challenges, strategies and initiatives for using information technology to drive health care reform were discussed by the Committee throughout 2008. Senate Bill 196, which was sponsored by Senator Bob Hagedorn and Representative Tom Massey, suggested several aspects of HIT to be considered by the Committee in developing their recommendations presented in this report. These topics included electronic medical records, computerized clinical support systems, computerized physician order entry, regional data sharing interchanges for health care information, data privacy and security measures, and other methods of incorporating Information Technology to pursue greater cost-effectiveness and better patient outcomes in health care. The Committee members were appointed by Governor Ritter to represent various stakeholder perspectives on this critical issue. Their individual expertise ranged from medical practitioners, employer groups and the HIT industry to home health providers, consumers and the Colorado General Assembly.

HIT refers to the use of computer hardware and software to store, protect, retrieve and transfer health-related clinical, administrative and financial information electronically within and across health care settings. HIT is applied in a range of health care settings from small primary care offices to large databases used by multiple research organizations. Specific benefits sought through the development of a statewide HIT system are improving health care quality, preventing medical errors, reducing health care costs, increasing administrative efficiencies, decreasing paperwork, and fostering affordable care. Stakeholders who are forming the current and future aspects of HIT and health information exchange (HIE) include anyone in the health care process who “touches” the patient. From primary care and specialty physicians to pharmacists and nursing home staff, all stakeholders are seeking ways to fund, implement and sustain HIT for their organizations and the consumer.

Three major types of information systems are at the forefront of efforts to create and store health records: **electronic medical records** (EMRs), **electronic health records** (EHRs), and **personal health records** (PHRs). Additional functionalities that provide important patient care support include electronic prescribing, patient registries for monitoring and profiling patient care metrics, and electronic communication between clinicians and patients. Each technology offers its own set of opportunities and challenges. Overlying all these technical components is the need for interoperability — the capacity to electronically move clinical information between disparate health care information systems, while maintaining the meaning of the information being exchanged. Achieving the capacity for interoperability, also referred to as HIE, is essential to making health information available when and where it is needed for cost-effective, high quality health care, public health monitoring, quality reporting, research and other purposes.

The State of Colorado’s leadership is critical to the development, adoption, and sustainability of HIT infrastructure. In turn, HIT can support Governor Ritter’s Building Blocks to Health Care Reform Initiative by increasing efficiency and encouraging patient responsibility. State leadership is critical to establishing interoperability, ensuring consumer privacy, and driving HIT adoption to benefit all Coloradans. Such efforts are foundational for containing health care costs in the State budget. HIT can have a major impact in streamlining the Medicaid program and other State administrative costs.

State leadership needs to take into account and build upon stakeholder efforts that are currently underway. Creation of a predictable, transparent and inclusive HIE governance structure within the State is a critical collaborative step that has already been taken by Colorado stakeholders to establish the Colorado Regional Health Information Organization (CORHIO). State leadership can

The State's initial approach should be to help build interoperability and provide incentives for adoption

help provide financial incentives for statewide HIT through grants and tax credits, promote standards-based HIT usage, offer public education, foster stakeholder consensus for HIT implementation strategies, and develop workforce initiatives to ensure adequate capacity for supporting expanded HIT use.

Nationally, the evolution of HIT and HIE is being influenced by both Federal agencies and State-led alliances. The Office of the National Coordinator for HIT in the U.S. Department of Health and Human Services has provided funding for a variety of health care technology initiatives. The State-level HIE Consensus Project has studied the development of state-level HIE initiatives and helped identify key characteristics and best practices for developing statewide HIE. Colorado has participated as part of the Project's Steering Committee and benefited by lessons learned across the states. The State Alliance for eHealth, led by the National Governor's Association, helped to engage state governments in understanding key opportunities for HIT development and produced recommendations to help advance a framework for individual state efforts. A majority of the Committee's recommendations for the State of Colorado coincide with these recommendations issued from the State Alliance for eHealth. The Health Information Security and Privacy Collaborative (HISPC Project) engaged states in analyzing statewide barriers to privacy and security and in developing solutions to promote safe, secure electronic information sharing. Representatives from Colorado participate in both the State-level HIE Consensus Project as well as the HISPC Project.

The recently signed American Recovery and Reinvestment Act (ARRA) provides \$19 billion in Federal funding to accelerate adoption of HIT systems. One specific provision of the ARRA allocates funds for a state, or its state-designated entity, to facilitate implementation of a statewide HIE plan. The Act also strengthens Federal privacy and security laws to protect personally identifiable health information from misuse and abuse.

Overall, the Committee's findings and observations found many positive accomplishments across the State of Colorado. Currently numerous efforts are under way to build a statewide HIT system. These efforts include State and regional initiatives, public-private collaborations, and not-for-profit coalitions. CORHIO, a statewide organization representing diverse stakeholders, facilitates HIE to improve health and health care for all Coloradans. It serves to convene and foster collaboration among stakeholders by involving the private sector, state government, and non-profit organizations. CORHIO is working to provide HIE services, establish a secure environment and data sharing framework, and foster HIE implementation solutions that serve communities across Colorado. This involves working actively with the Colorado Office of Information Technology, The Colorado Health Foundation's HealthyConnections HIT grant program for safety net providers, and with regional HIE efforts such as Quality Health Network on the Western Slope and the Northern Colorado Health Alliance in Greeley. CORHIO is part of a nationwide effort to foster HIE organizations whose ultimate goal is establishment of a Nationwide Health Information Network.

Another challenge is that providers are at various stages of program development, which limits the potential for interoperability

Challenges facing the advancement of HIT in Colorado are complex. Implementation costs may be prohibitive, and stakeholders are confronted with significant uncertainty regarding their return on investment. Another challenge is that providers are at various

stages of program development, which limits the potential for interoperability. Both providers and consumers lack knowledge on how to use health care information systems. Additionally, HIT technology standards set for Colorado must be compatible with Federal standards and those of other states. Finally, the unique privacy concerns associated with medical records must be taken into account.

HIT and HIE should be incorporated into Colorado's long range plan for health care reform. This plan should be based on a road map with phased implementation, starting with adoption of the electronic systems that are most cost-effective and easiest to implement. The State's initial approach should be to help build interoperability and provide incentives for adoption. Over the long-term, the State might more aggressively promote adoption through mandates coupled with education.

Based on these findings, observations, and suggested road map strategies, the Committee's recommendations to enhance safe, timely, efficient, effective, equitable, and patient-centered care through HIT include:

- Designate a single entity as the primary organization to provide governance, promote HIE, and collaborate with other regional health information organizations
- Promote the use of electronic prescribing
- Promote the adoption of clinical data collection and sharing of information among providers
- Support the use of personal health records and other private sector solutions
- Increase awareness and educate stakeholders on benefits, tools, patient rights and provider obligations
- Create a specific HIT resource within the Office of Information Technology (OIT)
- Encourage private sector adoption through education, incentives and policy

GLOSSARY OF TERMS

American Health Information Community (AHIC)	A federally chartered public-private advisory body created to provide recommendations to HHS regarding how to make health records electronic and interoperable. The successor to this body was incorporated during 2008 and renamed the National eHealth Collaborative (NeHC).
Agency for Healthcare Research and Quality (AHRQ)	An agency within the HHS that operates various research programs aimed at improving the nation's health care.
Certification Commission for Health Information Technology (CCHIT)	A voluntary organization created by three health technology organizations to verify that various health information products meet certain standards.
Centers for Medicare and Medicaid Services (CMS)	A federal agency responsible for administering the Medicare and Medicaid programs.
Clinical Decision Support Systems (CDS)	Software tools that assist care providers by offering advice or "best practice" recommendations for a patient's situation by using information about the individual patient and a database of recommended procedures. Such capabilities are now frequently incorporated into EHR, CPOE, and eRx products.
Computerized Physician Order Entry (CPOE)	These products are clinical information technology tools that physicians and other providers can use to enter orders, such as prescription drugs or lab tests, into a computer system for further patient action. They are most frequently used in hospitals. Similar to eRx technology, CPOE products were sold as stand-alone tools in the past but are now often incorporated into EHR packages.
Continuity of Care Document (CCD)	A summary of pertinent data on a patient's health status (problems, medications, allergies, etc.) and information about insurance, advance directives, and treatment recommendations.
Disease Registry (also known as Chronic Disease Management System)	An electronic system used to capture, manage and provide information on specific conditions to support organized care management for all of a provider's patients.
eHealth Initiative (eHI)	A national nonprofit organization whose mission is to improve the quality, safety, and efficiency of health care through information and information technology.
Electronic Health Record (EHR)	An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinical staff across more than one health care organization.
Electronic Medical Record (EMR)	An electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization.
Electronic Prescribing (e-prescribing or eRx)	Use of electronic devices to create, process, and communicate prescriptions for medication.
Department of Health and Human Services (HHS)	A federal agency responsible for administering a wide variety of health programs, including other federal departments such as the Centers for Medicare and Medicaid Services.

Governance	The combination of processes and structures implemented by an organization in order to inform, direct, manage and monitor the activities of the organization toward the achievement of its objectives, including guiding strategic and key operational decisions made for the enterprise. It clarifies relationships and responsibilities among the entities making up the enterprise.
Health Information Exchange (HIE)	The electronic movement of health-related information among organizations according to nationally recognized standards. HIE refers to the process of interoperable electronic health-related information sharing conducted in a reliable manner that protects the confidentiality, privacy, and security of individuals. This includes the capability to electronically move clinical information between disparate health care information systems to facilitate access to and retrieval of clinical data, thereby helping to provide safer, timely, efficient, effective and equitable patient-centered care.
Health Information Portability and Accountability Act (HIPAA)	A 1996 federal law that establishes a variety of standards for the security and privacy of health care information.
Health Information Organization	An organization that oversees and governs the exchange of health-related information among organizations according to nationally recognized standards.
Health Information Technology (HIT)	Generally considered to be the use of computer hardware and software to store, protect, retrieve and transfer clinical, administrative and financial information electronically within health care settings.
Interoperability	(1) The ability of various HIT products to exchange information safely and securely and (2) The ability of two or more systems or components to exchange information and to use the information that has been exchanged.
Office of the National Coordinator for Health Information Technology (ONCHIT)	An office established within the HHS to oversee the Federal government’s policies for promoting health information technology.
Personal Health Record (PHR)	Electronically stored information similar to electronic health records but maintained by an individual and limited to information on the individual’s health conditions and treatment history.
Regional Health Information Organization (RHIO)	A health information organization that brings together health care stakeholders within a defined geographic area and governs health information exchange among them for the purpose of improving healthcare in that community. The members typically establish (1) an electronic network for communicating multiple types of health information using standardized information formats and transmission conventions and (2) rules governing various aspects of the group’s operation, including financing.

Sources:

¹ National Alliance for Health Information Technology. “Defining Key Health Information Technology Terms”; 2008; www.hhs.gov/healthit/documents/m20080603/10.1_bell.html.

² California HealthCare Foundation. “HIT Glossary of Terms”; January 2008; www.chcf.org/documents/chronicdisease/HITGlossary.pdf.

³ http://www.lao.ca.gov/2007/health_info_tech/health_info_tech_021307.aspx

I. LEGISLATIVE BACKGROUND AND COMMITTEE ORGANIZATION

Legislation Goals

The Health Information Technology Advisory Committee was created by Senate Bill 196 in 2007 to develop a long-range plan for statewide health care information technology (HIT). Issues explored by the committee include:

- Strategies for incorporating HIT into the health care delivery system
- Changes to State legislation in order to be consistent on both the state and interstate levels for advancing HIT interoperability
- Changes to laws in order to best support privacy and security in the transmission of electronic health information at the state and interstate levels
- Strategies for correcting major deficiencies in information sharing in the health care delivery system
- Directions for the executive and legislative decision-making bodies to implement strategies proposed by the long-range plan and
- Strategies for creating or obtaining funding and sustaining financial support for any approaches proposed by the committee

Senate Bill 196 suggested several aspects of HIT to consider as the Committee developed its recommendations:

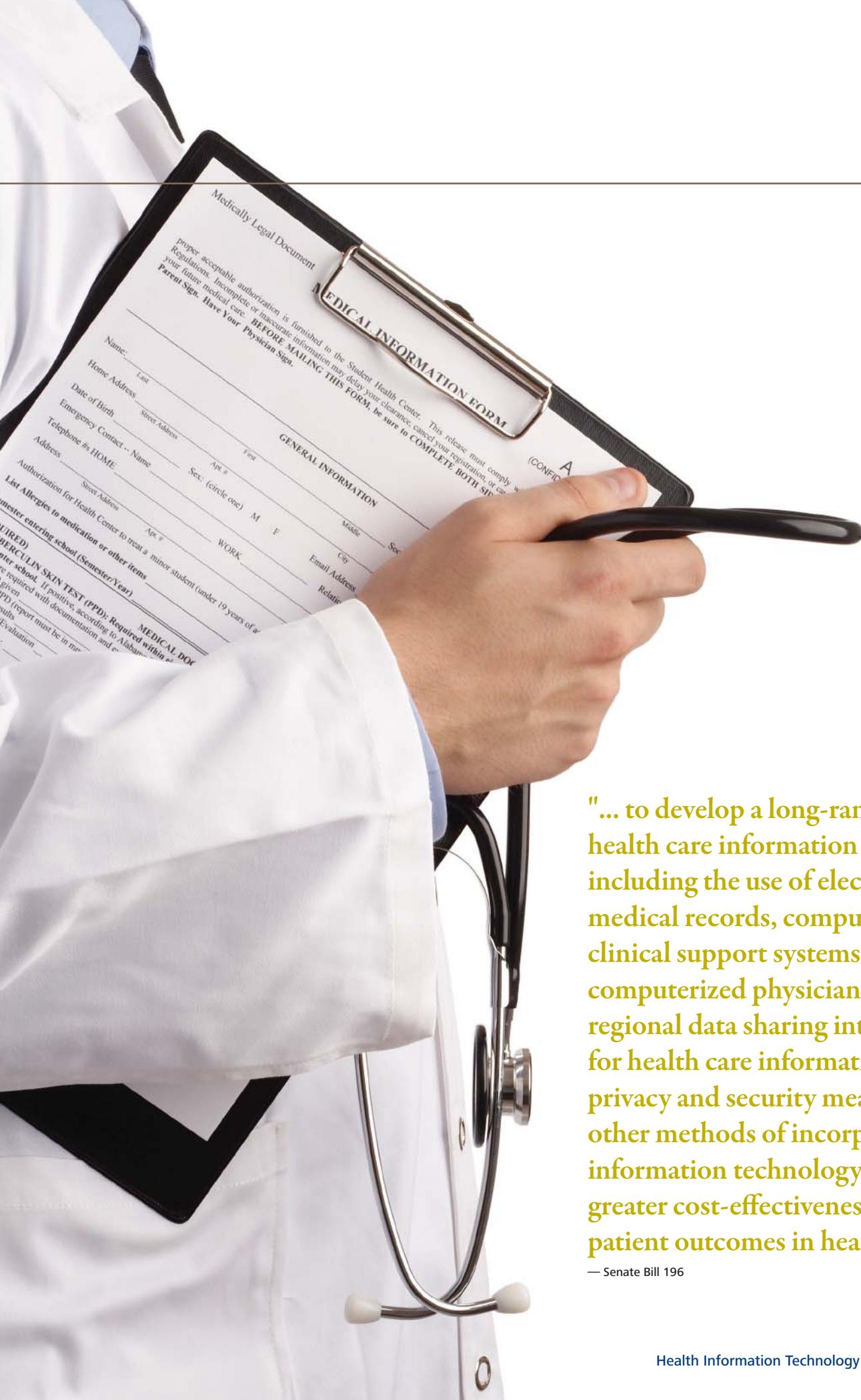
- Electronic medical records
- Computerized clinical support systems
- Computerized physician order entry
- Regional data sharing interchanges for health care information
- Data privacy and security measures
- Other methods of incorporating IT to pursue greater cost-effectiveness and better patient outcomes in health care

Role of the Committee

The Health Information Technology Advisory Committee consists of members who have been appointed by Governor Ritter and have key perspectives and expertise relative to HIT. The following stakeholder groups were represented on the Committee:

- Academic institutions
- Insurance industry
- Pharmaceutical industry
- Employer groups
- Attorney General's Office
- Governor's Office
- Medical practitioners
- Medicare and Medicaid
- HIT industry
- Information technology associations
- Home health providers
- Mental health providers
- Consumers
- Colorado Regional Health Information Organization (CORHIO)
- Colorado General Assembly
- An association representing many Colorado hospitals, including private and government-operated, metropolitan and rural, investor-owned and not-for-profit

The Committee held regular monthly meetings throughout the course of 2008 to examine the HIT landscape. Through this investigation, committee members gained stakeholder input and insights regarding issues, opportunities and priorities for HIT development. They also formulated key observations and recommendations for developing effective and sustainable statewide and regional HIT. The Committee's efforts have culminated in this report that includes recommendations and a road map for building a statewide HIT system in Colorado.



"... to develop a long-range plan for health care information technology, including the use of electronic medical records, computerized clinical support systems, computerized physician order entry, regional data sharing interchanges for health care information, data privacy and security measures, and other methods of incorporating information technology in pursuit of greater cost-effectiveness and better patient outcomes in health care."

— Senate Bill 196

II. OVERVIEW OF HEALTH INFORMATION TECHNOLOGY

What is Health Information Technology?

Health information technology (HIT) spans a variety of definitions, functions and stakeholders. HIT refers to the use of computer hardware and software to store, protect, retrieve and transfer health-related clinical, administrative and financial information electronically within and across health care settings. HIT is applied in a range of health care settings from small-scale environments, like a patient medical record system in a single doctor's office, to large-scale interconnected databases with extensive information sharing capabilities that enable sophisticated analysis such as disease research and bio-surveillance. Features of an effective health information system include: technology adoption among all stakeholders, interoperability to enable health information exchange (HIE), and governance to sustain an evolving system.

Why is Health Information Technology So Important?

The goal of HIT is to facilitate access to and retrieval of clinical data in order to provide safer, more timely, efficient, effective, equitable, and patient-centered care.

The U.S. Department of Health & Human Services (HHS) advocates the broad use of HIT since it "allows for the comprehensive management of medical information and its secure exchange between health care consumers and providers." According to a study that directly measured physicians' use of HIT in a hospital setting¹, when physicians use HIT to its full potential there are fewer

patient deaths, fewer complications, and lower health care costs. Adopting and implementing HIT supports numerous public and private objectives:

- Improving health care quality
- Preventing medical errors
- Reducing health care costs
- Increasing administrative efficiencies
- Decreasing paperwork
- Expanding access to affordable care²

Stakeholder Interests in HIT

HIT stakeholders include patients, care providers, and other groups who may not provide direct patient care but who may be contributors to and/or users of health information. These stakeholders include public and private payers, state employee benefit plans, quality improvement groups, regional health information organizations (RHIOs), public health agencies, researchers, specialty societies, and employer health programs. From this array of constituents, each stakeholder group has interests that are both common and unique. All stakeholders are looking to HIT for improving the overall costs, efficiencies and outcomes of the health care system.

Health care providers want access to timely, complete and accurate information with which to deliver safe and effective health services. Important provider priorities are the HIT systems' ease of use and accuracy of clinical information. Care providers broadly include anyone who may interact with a patient throughout the health care process:

- Primary care and specialty physicians
- Midlevel providers (physician assistants, nurse practitioners)
- Hospital, emergency and in-patient facility staff
- Nursing home staff
- Urgent care (including private sector

and employer-based) staff

- Ancillary staff (physical and occupational therapists, nutritionists, case managers, etc.)
- Home health nurses and clinicians
- School-based nurses
- Pharmacists and
- Clinical service providers (lab, radiology, etc.)

Payers' leading concerns are reducing costs and streamlining administration through standardization and process efficiency. Payers include private insurers, employers that provide employee health insurance, and government programs such as Medicare and Medicaid. They look to HIT to produce efficiencies in care delivery processes and to eliminate costly duplicative and unnecessary services and errors.

Employers' specific interest in HIT is keeping their own employees healthy in order to minimize health care service and insurance costs. Additionally, as business enterprises, employers are impacted by the overall costs of health care; and, they want to control unnecessary costs in the health care system

Research institutions, public health organizations, and quality improvement programs are stakeholders interested in the collection of and access to aggregate data obtained from HIT systems. Their concerns include bio-surveillance to detect and respond to infectious disease epidemics, the management of chronic diseases, and emergency preparedness.

The public at large experiences the cost burdens generated by our current system of fragmented paper-based health records. Patients are the ultimate stakeholder and beneficiary of HIT. Accuracy, safety and cost-effectiveness are just a few of the primary reasons cited by patients to hasten the implementation of electronic health information systems. Through the adoption of

HIT and HIE, locally, regionally and statewide, patients may receive better quality care.

Overall, stakeholders have a spectrum of interests in the implementation, use and outcome of HIT. To serve current and future health needs, an effective HIT system incorporates multiple components that link the entire continuum of health care. Core dimensions of an effective electronic health information system include:

- Broad adoption of health information technologies among all stakeholders
- Widespread sharing of health information through interoperable systems with the capacity for HIE between sources and users of health information
- Policies that establish consistent confidentiality provisions
- Financing for initial system investments and ongoing sustainability
- Governance to support effective stakeholder collaboration and consensus in order to develop coordinated HIT capacity and to sustain a shared HIE system

Health Information Technologies

Three major automated information systems are at the forefront of evolving technologies being used to create and store health records: electronic medical records (EMRs), electronic health records (EHRs), and personal health records (PHRs).³ In addition to these core technology products, there are other functionalities that provide patient care support to clinicians and patients such as electronic prescribing, patient registries for monitoring and profiling patient care metrics, electronic communication between clinicians and patients, and telemedicine services.

Electronic Medical Record The Agency for Healthcare Research and Quality defines an electronic medical record (EMR) as "the set of databases (or repositories) that contains the health information for patients within a given institution or organization."⁴ The EMR is created in hospitals and ambulatory settings and is used by the provider (physician, clinic, or hospital) creating the record. This information may be provided directly by the patient or a caretaker, or be produced on site by the clinical staff based on vital signs, tests and treatments. EMRs commonly include notes and records, test results, and order entry. EMRs help physicians save time and money and improve quality of care through health management guidelines and decision support. Generally, EMRs do not currently include registries or reporting functionality.

Electronic Health Record An Electronic Health Record (EHR) provides the ability to easily share medical information among stakeholders and to have a patient's information follow him or her through the various modalities of care engaged by that individual.⁵ It "is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting." EHR information may

include patient demographics, progress notes, problems, vital signs, past medical history, medications, immunizations, laboratory data and radiology reports. The compilation of this information automates and streamlines the clinician's workflow. As such, the EHR has the ability to generate a complete record of a clinical patient encounter, as well as supporting other care-related activities directly or indirectly via interface. These activities may include evidence-based decision support, quality management, and outcomes reporting.⁶

The public and many health care professionals, however, have not made a distinction between EHRs and EMRs and are not clear on their differences. In 2005, Healthcare Informatics provided a simple overview of the difference: "EMRs are computerized legal clinical records created in Care Delivery Organizations (CDOs), such as hospitals and physician offices. EHRs represent the ability to easily share medical information among stakeholders and to allow it to follow the patient through various modalities of care from different CDOs." EMRs are what currently exist in most practices that have adopted electronic record systems, but EHRs "are what the nation

EHR Case Study: Denver Health

Denver Health is an integrated, citywide network of 25 health care delivery sites including community health centers (CHCs), school-based clinics, a public hospital and a public health department that provides care to medically underserved and indigent citizens of Denver. A study in two Denver Health clinics demonstrates how technology is being used to support health care providers in carrying out recommended preventive screening programs. Screening programs increasingly follow national guidelines that demonstrate a link between certain characteristics and a patient's risk for a disease or condition. To identify patients for whom screening for tuberculosis was recommended, individual patient information from Denver Health's electronic health records is automatically compared to the Centers for Disease Control and Prevention (CDC) screening guidelines for tuberculosis. For patients who met CDC guidelines, the system created a written alert for the physician, identifying the risk potential and recommending further assessment. This alert was placed on the top of the patient chart at the time of the visit. Physicians had access to a web-based tool to conduct an assessment and identify patients for whom further testing was recommended. During the study, appropriate screening following CDC guidelines increased 189 percent. These programs aid not only the individual patients for whom active tuberculosis can be avoided, they can also improve public health by reducing the wider spread of tuberculosis.⁷

aspires to.”⁸ Both concepts are crucial to the success of local, regional, and national goals to improve patient safety, improve the quality and efficiency of patient care, and reduce health care delivery costs. EHRs are reliant on EMRs being in place, and EMRs will never reach their full potential without interoperable EHRs in place.⁵

The Colorado Business Group on Health has noted that the value of personal health records to individuals who voluntarily create them to include:

- Opportunity to aggregate their information in a secure, organized, portable and retrievable way
- Opportunity to aggregate records across specialists, home care providers, pharmacies and medical device manufacturers and others that are not currently available to consumers
- Promote personal responsibility for health
- Opportunities to reduce medical and medication errors and to reduce costly duplication of labs and other tests
- Opportunities to share records with health care providers and family members
- Opportunities to store durable power of attorney and advanced medical directives to be available at a time of need

Personal Health Record Through a Personal Health Record (PHR), patients can participate in documenting their medical history and communicate with their provider. The PHR is an “electronic, lifelong resource of health information needed by individuals to make health decisions. Individuals own and manage the information in the PHR, which comes from health care providers and the individual. The PHR does not replace the legal record of any provider.”⁹

A PHR is a consumer driven collection of medical records gathered from various sources of health care caregivers for the benefit of the consumer. The PHR allows consumers to collect information such as: medications, drug interaction warnings, allergy identification, test results, conditions, immunizations, insurance, lab results, chronic illness details, treatment data, and much more. An important aspect of PHRs is that consumers control the content of and access to their records. PHRs enable consumers to be proactive about their personal health care and provide emergency information to doctors which are critical due to our mobile lifestyles. Additionally, PHRs provide a mechanism for consumers and medical professionals to communicate, and thus reduce unnecessary visits. In a major disaster, use of PHRs can provide continuity of care when records are lost. PHRs are generally patient-owned and managed; and, they are portable between payers, providers, etc.

Employers are promoting PHRs because this is one technology that is low in implementation cost and high in value. Employers are taking on roles to educate their employees and encourage PHR use. Furthermore, some have underwritten the modest cost of PHR

subscription on behalf of their employees. Health plans are also interested in promoting PHR use as a way to encourage proactive health management and health promotion.

If PHRs are broadly implemented and utilized, their specific benefits may include:

1. Patients with chronic illnesses will be able to track their diseases in conjunction with their providers, promoting earlier interventions when they encounter a deviation or problem.
2. Improved communication will make it easier for patients and caregivers to ask questions, to set up appointments, to request refills and referrals, report problems, and to reduce adverse drug events.
3. PHRs make easier for patients to share their records broadly with others including family and home health providers.
4. PHRs are portable and will travel between employers, health-plans, geographic regions etc.
5. PHRs can alert for issues (e.g. drug interactions) and provide appropriate health care education and provider-based messages for improved patient care.¹⁰

EHR Case Study in Multi-ethnic Populations

Colorado Asian Health Education and Promotion (CAHEP) is a community-based organization primarily serving Asian American Pacific Islander population in Colorado, with linkages to Hispanic and African American populations. It provides services for screening of “disparity” diseases, and their related education and treatment. It has developed an EHR system for data-collection and analysis that provides user interface in multiple languages This system supports integrated risk-assessment with multi-ethnic parameters.

CAHEP’s health information system engages patients, their family and medical provider, along with their insurance provider, if they have one. The system is portable and currently supports point-of-care tests for diabetes, cardiovascular disease, women’s health, pulmonary diseases and others, by utilizing appropriate risk-assessment procedures, based in part on personal data and standardized disease risk scores. This system also provides tools to support “triggers” for follow-up care, referral and treatment decision-support.

Electronic Prescribing To improve the medication management process between doctors, clinicians, patients, and pharmacists, electronic prescribing (e-prescribing) incorporates a set of tools for achieving this objective. These tasks, traditionally done manually, include:

- Writing the prescription
- Transferring the prescription between prescriber and dispenser
- Dispensing the medication
- Supporting associated administration
- Monitoring the prescription's impact

E-prescribing can also provide clinical decision support to aid in safer, more informed prescribing such as access to information on drug-drug interactions, drug-allergy interactions, patient medication history, pharmacy eligibility, formulary (which specifies a patient's drug coverage), and benefits information. It is important to emphasize that e-prescribing is increasingly used by physician practices within the context of EHRs, which provide broader functionality and support more gains in quality and safety.¹¹

Registries A registry is an electronic tool for tracking individual clinical care and population clinical care information. It is a database that stores disease-specific individual and population-based information to support care management, outreach, quality improvement, and outcome research. Registries help identify patients with gaps in care by capturing, managing, and providing information on an individual's disease or condition to support care management.

Registries are crucial components in helping practices manage their patients more effectively. They identify overdue patients, provide electronic access to professional guidelines, implement care management systems, produce automated reminders, assess quality improvement, and produce provider-organizational specific reports. Registries are effective and important tools in assisting physician offices and clinics to achieve improvement of clinical outcomes.¹² Many registries are free of charge or fairly inexpensive to purchase or access.

Several Colorado providers have noted that disease registries were invaluable in demonstrating to clinicians how HIT could

be used to improve the care they were delivering. In addition, many physician "IT champions" who have been critical to successful adoption were first exposed to HIT through registries.⁷

Electronic Communication When responsibility for a patient's care is passed from one provider to another, such as during a referral from primary care to a specialist, or a transition from a hospital to outpatient care, opportunities for error are created. Similar opportunities are created when new data is generated from blood tests, x-rays, and other exams that need to be transmitted between care providers. Secure electronic communication offers a chance to reduce these errors, and improve communication and coordination of care.

Telehealth uses technology to deliver health care services, usually remotely (e.g., remote monitoring, video diagnostics, etc.). While issues related to telehealth were not addressed in depth by the Committee, there may be opportunities for HIT and telehealth projects to share technology, especially broadband connectivity.

Registry Case Study: The Plains Medical Center

The Plains Medical Center in Limon, Colorado, is a system of four clinics serving patients in five counties, covering 4,000 square miles on the eastern plains of Colorado. Plains is committed to quality improvement by addressing the needs of their diabetic patients. Efforts include the development of an electronic registry that allows the healthcare provider to easily identify how well patients are doing both individually and as a group, as well as by specific demographics. The registry provides current, accurate information and enables the staff to easily contact patients monthly to remind them of follow-up visits or tests.

Data from the registry, coupled with personal follow-up with these patients at risk, resulted in dramatic improvements in the quality of care. Plains now meets or exceeds national quality standards for hemoglobin A1c and cholesterol levels, including increasing the number of diabetic patients with LDL cholesterol levels under 100 from 40 percent to nearly 80 percent in one year. Better control of these measures helps prevent long-term complications and leads to improved patient outcomes.⁷

Registry Case Study: Denver Health

In 2007, doctors, nurses, pharmacists, and information technology staff at Denver Health teamed up to improve the care of patients with hypertension (high blood pressure). The conventional approach was to educate care providers about the best treatment of high blood pressure. Studies, however, have demonstrated consistently that this conventional approach results in slow and modest improvement at best.

The Denver Health team identified all patients (hospital and outpatient) who had high blood pressure. Then, they gathered all the patients' information relevant to the care of this single condition. From EMRs and from the pharmacy and laboratory data bases to create a registry of patients with hypertension.

By studying the data in the registry, the team concluded that a primary reason for uncontrolled high blood pressure was that patients frequently missed doses of their medications. The team designed a report from the registry to inform providers which patients were missing medication doses and summarized recent blood pressure measurements and medications, allowing providers to address these issues during office visits.

Interoperable Health Information Exchange

Overlying all these components of HIT is interoperable health information exchange (HIE). HIE is the capability to electronically move clinical information between disparate health care information systems while maintaining the meaning of the information being exchanged. HIE is key for being able to significantly impact the efficiency and effectiveness of health care; making health information available when and where it is needed in a timely and efficient manner for individual patients and providers; and ensuring effective public health monitoring, quality reporting and research. Organized capacity for HIE is being established around the country to promote health information sharing among diverse health care providers and across the continuum of health care and public health institutions who need to be able to share clinical information in real time, under stringent security, privacy and other protections.¹³ Building this level of broad interconnectedness requires that standards be in place for HIT products and common data specifications be outlined.

Because interoperability inherently involves diverse data sources, organizations, and purposes, a distinct organizational infrastructure is needed to ensure that interoperability is achieved in an inclusive and cost-effective manner that serves all stakeholders and improves health care. While RHIOs and other HIE efforts have developed

in local communities, almost all states have seen the development of state-level HIE entities, similar to CORHIO, that have helped convene stakeholders, foster collaboration, and lead implementation of road maps for statewide HIE implementation. In many cases, this involves also sponsoring HIE services through the state-level HIE organization to fill gaps and achieve statewide data sharing. While in some states these initiatives have been government hosted, at least initially, others have been more akin to quasi-public utility entities; and, still other state-level HIE organizations have been created as non-profit organizations outside state government. Despite these different models, there is growing consensus that the convening and coordination provided by these entities is essential for guiding negotiated stakeholder solutions for practical, incremental HIE implementation that links local, statewide and national efforts.

Overall, HIT and HIE are a complex interplay of tools and stakeholders needed for improving health care. A publication of the Institute of Medicine titled "Crossing the Quality Chasm" purported that, "between the health care we have and the care we could have lays not just a gap, but a chasm." To improve this situation, they recommend six specific aims: health care should be safe, effective, patient-centered, timely, efficient and equitable. There is growing evidence that technology plays an important role in our ability to transform the current health care system, both at the individual practice level and among multiple providers. However, given some of the potential challenges and

HIE Case Study: CORHIO

On December 1, 2008, CORHIO initiated a Point of Care Inquiry System that allows clinicians in emergency rooms at Denver Health, Kaiser Permanente's Hub, The Children's Hospital and University of Colorado Hospital to retrieve records on a consenting patient. This system uses all available federal standards to exchange information. In the first week alone, two incidents offered examples regarding the importance of interoperability. First, in one emergency room, a physician asked a patient who had been in an auto accident how many medications she was taking. The patient's answer was inaccurate as one might expect following an accident. The CORHIO system showed the physician which medications the patient was actually taking and the patient's pain management regimen was developed to accommodate all the medications. A second incident involved patient with abdominal pain. Because records from the patient's previous visits to other providers were available through the CORHIO system, the time and effort spent to help the patient were reduced and care was available more quickly, more accurately and more readily.

tremendous fragmentation in the Colorado health care marketplace, it will take a thoughtful, phased approach to increase HIT adoption statewide, improve quality, decrease costs, and increase satisfaction for patients, healthcare providers, and other stakeholders.¹⁴

Research has shown that key roles and functions at the state level are important to supporting the development of HIT and HIE in ways that benefit the general public. State-level HIE initiatives provide a range of functions and tasks organized around two distinct roles:

- **Governance:** A primary role to neutrally convene health care stakeholders, promote collaboration, develop consensus, coordinate policies and procedures to secure and facilitate data sharing, and lead and oversee statewide HIE.
- **Technical Operations:** An optional and variable role to manage and operate the technical infrastructure, services, and/or applications to support statewide HIE. A range of HIT technical applications and operations can be owned and operated by the state-level organization or managed through contracts with outside technical providers.

Governance		Technical Operations
Convene	Coordinate	Operate/Manage
<ul style="list-style-type: none"> • Provide neutral forum for all stakeholders • Educate constituents and inform HIE policy discussions • Advocate for statewide HIE • Serve as an information resource for local HIE and HIT activities • Track/assess national HIE and HIT efforts • Facilitate consumer input 	<ul style="list-style-type: none"> • Facilitate alignment with statewide, interstate, and national HIE strategies • Promote consistency and effectiveness of statewide HIE policies and practices • Coordinate implementation of HIE solutions as part of statewide road map to interoperability • Support integration of HIE efforts with other health care goals, objectives, and initiatives 	<ul style="list-style-type: none"> • Own or contract with vendor(s) for the hardware, software, and/or services to conduct HIE



¹ <http://www.commonwealthfund.org/>

² <http://www.hhs.gov/healthit/>

³ Linking Children's Health Information Systems: Clinical Care, Public Health, Emergency Medical Systems, and Schools, Alan R. Hinman and Arthur J. Davidson, PEDIATRICS Vol. 123 Supplement January 2009, pp. S67-S73 (doi:10.1542/peds.2008-1755D), http://pediatrics.aappublications.org/cgi/content/full/123/Supplement_2/S67

⁴ Agency for Healthcare Research and Quality. Electronic medical/health records, http://healthit.ahrq.gov/portal/server.pt?open=514&objID=5554&mode=2&holderDisplayURL=http://prodportalb.ahrq.gov:7087/publishedcontent/publish/communities/k_o/knowledge_library/key_topics/health_briefing_01232006114616/electronic_medical_health_records.html

⁵ Electronic Medical Records vs. Electronic Health Records: Yes, There Is a Difference, A HIMSS Analytics™ White Paper, Dave Garets and Mike Davis, Updated January 26, 2006, http://www.himssanalytics.org/docs/WP_EMR_EHR.pdf

⁶ www.HIMSS.org/ASP/topics/ehr.asp

⁷ The Colorado Health Foundation's report: Health Information Technology: A strategy for creating a healthier Colorado, February 2007

⁸ http://www.informatics-review.com/wiki/index.php/EMR_Definition

⁹ American Health Information Management Association. Defining the personal health record. http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_027351.hcsp

¹⁰ Personal Health Records: Definitions, Benefits, and Strategies for Overcoming Barriers to Adoption, Paul C. Tang, MD et al.]

¹¹ Electronic Prescribing becoming mainstream, June 2008, page 12, http://www.ehealthinitiative.org/assets/Documents/eHI_CIMM_ePrescribing_Report_6-10-08_FINAL.pdf

¹² East, J., Krishnamurthy, P., Freed, B., Nosovitski, G., 2003, Impact of a diabetes electronic management system on patient care in a community clinic. American Journal of Medical Quality, 18(4), 150-154

¹³ National Health Information Network (NHIN): Background. <http://www.hhs.gov/healthit/healthnetwork/background/>

¹⁴ <http://www.ahrq.gov/news/ulp/buyright/clancys.txt>

III. PUBLIC POLICY INTERESTS AND ROLE FOR STATE OF COLORADO

“I believe there is an appropriate and important role for government, both at the state and federal level, to establish the infrastructure needed to make widespread adoption of health information technology a reality.”

— Bill Ritter, Jr., Governor of the State of Colorado⁴

The State of Colorado’s administration of health policy and stewardship of public dollars devoted to HIT is critical to its infrastructure development, technology adoption, and sustainability. The State’s greatest role though is realizing the potential of HIT for its citizens.¹ There are several important reasons for achieving a statewide HIT system. Statewide electronic access for health information will support long-standing public policy objectives on many fronts such as improving health care quality and reducing costs. In addition, Colorado statutes, regulations and other State health policy that influence HIT capabilities will play a significant role in ensuring patient privacy rights and adequate health care safety, quality and access.

Building Blocks to Health Care Reform

In early 2008, Colorado Governor Bill Ritter announced the “Building Blocks to Health Care Reform” initiative. This multi-faceted effort to make bold and realistic reform in the State’s health care system has been tasked with the global issues of improving quality, addressing costs, and expanding access. HIT will play a critical part in implementing the initiative’s long-term strategies. This promise to Colorado citizens incorporates broad health care system improvements that will be significantly supported by HIT systems such as EHRs and PHRs, functional tools including registries, and the development of HIE.

The policy interests and role for the State of Colorado in HIT are synchronous with those of the Building Blocks initiative. It has been demonstrated that states with explicit and strong commitments to leverage HIE as part of their broader health care agendas have had the most success to date in financing and implementing state-level HIE.³ Colorado’s comprehensive approach to building electronic health systems through the Building Blocks and HIT initiatives is clearly on the right path.

Budget Impacts and Reduced Costs

The annual budget for the State of Colorado is significantly impacted by health care costs. Currently, the State spends approximately \$2.8 billion per year in health programs. Public dollars fund numerous safety net programs such as Medicaid, a State government health coverage program. State government employee health care benefit costs are paid by public dollars. Funding levels for Colorado’s prison and university systems incorporate significant health care expenses. Additionally, State funds are appropriated for bio-surveillance and public health monitoring. The true value of the Colorado’s investment in HIT will be demonstrated in the quantitative and qualitative improvements to State health care programs. Unlike many investments that depreciate over time, the value of electronic health information increases with use.

HIT is expected to lower costs from multiple standpoints and should readily produce a return on investment for the State of Colorado through:

- Reduced duplicate treatments, tests, prescriptions
- Reduced paperwork for test results and medical records, in particular less paperwork for prescriptions through e-prescribing
- Increased e-communication between treating physicians and between physicians and patients
- Shared IT infrastructure investments

There are numerous case studies from other states implementing HIT programs that exemplify a diversity of benefits to be reaped. Specific to Medicaid, Colorado stands to gain from approaches being taken in other states for which HIT mechanisms are being developed to promote and support higher quality care and improved patient outcomes for Medicaid and State Children’s Health Insurance Program populations. Examples of HIT projects include:

- Supporting provider effectiveness by pushing clinically relevant claims data to the point of care (Missouri)
- Pulling and integrating clinical data for quality measurement, benchmarking, evaluation and improvement (New York City)
- Integrating Medicaid data with public health and other state and federal agencies for population monitoring (Utah)

“Building Blocks to Health Care Reform”

- Basic health care should be available and accessible to all.
- High quality health care should be available regardless of geography.
- Health care should be affordable and financed in a cost-effective manner.
- Medicaid must become more efficient and cost-effective.
- We must all take responsibility for our own health.
- Health care reform must be developed collaboratively.²

Improved Quality and Safety

Coloradans should not be satisfied with a health care system that does not take full advantage of information technologies. It is imperative to begin building a comprehensive, interoperable electronic health care information system in order to effectively monitor quality and safety and improve patient outcomes. HIT will improve diagnosis accuracy and the identification of drug interactions and allergies, while simultaneously reducing errors. Additionally, electronic systems will enable early detection of health conditions through remote monitoring, data sharing and other capabilities. Registries will benefit patient safety through improved treatment protocols. Moreover, HIT will improve the quality of care for chronic conditions and increase patient involvement in treatment.

While many benefits will not be immediate, the overall implications of a statewide HIT system will be profoundly positive. Budget requirements will be reduced for public health coverage programs including Medicaid and those for State employees. Public health expenditures will be used more effectively and bio-surveillance programs will benefit from increased efficiency. HIT initiatives will also create economic development through enterprising organizations that provide technical support and training. Furthermore, collaborative public-private partnerships will have the opportunity to pursue a variety of revenue generating programs supported by the technology. Overall, Colorado's

targeted efforts in developing, implementing, promoting and sustaining a statewide HIT system will create a general public good that benefits all stakeholders.

“We know from numerous studies that technology can dramatically reduce medical errors and in the process improve quality and reduce costs of care. As Governor, I will...promote regional health care quality collaborations to reduce costly medical errors and complications through better processes of care.”

— Bill Ritter, Jr., Governor of the State of Colorado⁴

State Leadership

The State of Colorado needs to play a leadership role in order for a statewide HIT program to be a success. State leadership needs to consider the impact of policies and actions in the context of other stakeholder efforts in order to prevent further siloing and achieve desired interoperability.⁵ The

ability to finance, develop and sustain health information systems requires the creation of an HIE governance and policy framework that is predictable, transparent and inclusive in order to build trust and accountability among all stakeholders.

A State toolbox for building and guiding HIE could include:

- Providing financial incentives such as grants and tax credits
- Offering public education and promoting standards-based HIT usage
- Building consensus among stakeholders
- Encouraging technology adoption and interstate and intrastate interoperability
- Ensuring patient privacy, security and consumer protection
- Enabling an overarching governance structure
- Developing workforce and agency capacity to support electronic HIE efforts.⁵

Improved health care quality, safety and cost savings for citizens, including Medicaid recipients and State employees can be readily realized through HIE, EMRs and e-prescribing, especially in the treatment of chronic conditions. Facilitating interoperability, however, is a complex, multi-year proposition.³ Being a proponent of HIT will fortify the capabilities of State public health missions such as disease tracking and pandemic alerts. In addition, information that can be compiled and made available through HIT will improve the effectiveness of public policy making. Moreover, State policy and leadership efforts in driving HIT will improve public good and the general population's health, and make Colorado an attractive place for relocation.

¹ The Federal Role in Promoting Health Information Technology, David Blumenthal, MD. The Commonwealth Fund, Perspectives on Health Care Reform January 2009

² Building Blocks to Health Care Reform presentation by Joan Hennenberry, Office of Governor March 10, 2008

³ Interim Report--State-level HIE Value and Sustainability: Approaches for financing and bringing interoperable HIE to scale, American Health Information Management Association, November 5, 2008

⁴ The Colorado Health Foundation's report: Health Information Technology: A strategy for creating a healthier Colorado, February 2007

⁵ Accelerating Progress: Using Health Information Technology and Electronic Health Information Exchange to Improve Health Care, Annual Report of the State Alliance for E-Health 2008

⁶ State-Level Health Information Exchange Final Report Part I: Ensuring Governance and Advancing Interoperability Executive Summary, March 10, 2008 American Health Information Management Association

IV. NATIONAL LANDSCAPE OF HIT AND HIE

Federal HIT Strategy and Initiatives

The federal HIT agenda was launched in 2004 under the Bush administration to drive transformation of the nation's health care system. Fueled by increasing evidence about the impacts of fragmented, inadequate information on health care quality, safety and costs, the federal government strategy focused health care reform efforts on moving the nation's health records from paper to electronic format (HIT adoption) and ensuring that health information can be readily exchanged and made available electronically (interoperability or HIE).

Guided by leadership from the U.S. Department of Health and Human Services, Office of the National Coordinator for HIT (ONC), the federal strategic plan for HIT (ONC), the federal strategic plan from 2004 was updated during 2008. The transformational vision for HIT and HIE remains unchanged. The ONC-coordinated Federal Health Information Technology Strategic Plan 2008-2012: Using the Power of Information Technology to Transform Health and Care (Strategic Plan) continues to affirm achieving interoperability as a core objective to support both patient-focused health care and population health.¹

Health care reform strategies anticipate that interoperable health information can help to redefine the health care landscape and marketplace and channel health-related investments to produce greater overall value in how health services are delivered and used. National-level health care reform efforts seek to create a new demand and drivers for generating and using electronic health information. The federal HIT Strategic Plan includes four broad themes for this development: adoption, interoperability, privacy and security, and collaborative governance. Putting the Strategic Plan into action involves leveraging existing as well as creating new health infrastructure

components to incorporate HIE-related roles and responsibilities, rules, incentives, oversight and rewards. Achieving these widespread innovations involves serious challenges to craft new relationships, resources, and the application of health information in the marketplace. Leadership at the federal level, through explicit efforts to link federal and state-level strategies, is elemental to making this happen across the landscape of regional, state and local HIE implementation.

Modern health care systems need HIT in order to perform to their full potential. A national systemic implementation, however, requires overcoming a host of financial, technical, and logistical obstacles. Through the power of collaboration and policymaking there are a numerous strategies and initiatives that the federal government can take to ease providers' and patients' fears and help pave the way for the future of health care.

U.S. health care providers make minimal use of HIT, especially compared with other health systems in the industrialized world. Right now, for example, about 17 percent of U.S. physicians and perhaps 8 to 10 percent of U.S. hospitals have at least a basic EHR system. However, in most European countries, as well as in New Zealand and Australia, 80 to 100 percent of primary care physicians have EHRs (although adoption rates for specialists and hospitals are far lower). Virtually every developed country has made a national commitment to increasing use of EHRs by their clinicians.¹

The U.S. is on a path toward similar widespread adoption of HIT and HIE. There are several factors for the country to take into account and act upon during this long-term process.

The recently enacted American Recovery and Reinvestment Act will provide funding to dramatically expand health information technology, which is expected to save billions

of dollars. A few of the Act's specific HIT components include:

- Providing support to states and state-level HIE efforts for implementing statewide plans for meaningful use of HIE that will result in health care quality and cost improvements
- Providing more than \$30 billion to accelerate adoption of HIT systems by doctors and hospitals, in order to modernize the health care system, save billions of dollars, reduce medical errors and improve quality
- Strengthening Federal privacy and security laws to protect personally identifiable health information from misuse and abuse

Interoperability Standards

The Office of the National Coordinator for Health Information Technology is responsible for the development and implementation of a nationwide HIT system that would allow for the seamless exchange of data and records. The federal HIT strategy calls for a network of networks to be developed, collectively forming a National Health Information Network. ONC has been fostering standards development through federal-level bodies such as the Certification Commission for HIT (CCHIT). CCHIT is working to develop standards for HIT products and HIE networks to ensure capacity for interoperability. Another federal-level entity, the Health Information Standards Panel has engaged diverse experts in developing interoperable HIE data specifications. These efforts form a data sharing framework upon which the vast array of HIE can develop.

In addition to the improvements in personal health care that seamless interoperability would make possible, many public health benefits would come to fruition with a standardized HIT system including: early detection of disease outbreaks around the country, improved tracking of chronic

¹ For purposes of clarity throughout this paper, HIE will be used to refer to HIT adoption efforts unless otherwise specified, since HIT adoption is an inherent prerequisite for HIE.

National Governors Association's State Alliance for eHealth Recommendations for HIE

Each state should develop or adopt a vision for state electronic health information exchange that leverages existing and planned public and private health information exchange efforts and outline an electronic health information exchange roadmap by the end of 2010 that must be implemented by 2014.

1. Governors and state legislatures should issue executive orders and adopt legislation that advances HIT adoption and health information exchange development. At a minimum, the following should be included:
 - Specific objectives for public program participation
 - Procedures for designing an HIE roadmap
 - An indemnity provision for HIE
 - Requirements for state agencies to adopt interoperable HIT
 - Consumer protections to ensure appropriate access to health data
 - Commitment to inclusiveness and diversity in HIE activities amongst health care providers, payers and consumers
 - State procurement rules that enable fair and flexible innovations, require the adoption of interoperable HIT applications and align with any statewide electronic HIE and HIT policies
2. Governors and state legislatures should designate a single authority for the state to coordinate state-government based electronic health information exchange implementation activities and work, in collaboration, with public-private electronic health information exchange efforts.
3. In line with the principles of achieving value-driven health care, state publicly funded health programs more effectively can track physician performance based on evidence-based measures and report cost and quality information to their enrollees by using HIT and developing electronic HIE.
4. State Medicaid agencies implementing EHR systems in the Medicaid program, should implement certified technologies (when available) and a standards-based PHR that is portable and includes appropriate privacy and other consumer protections.
5. State Medicaid agencies should implement incentive programs and/or reimbursement policies that will encourage provider adoption and use of HIT systems and participation in eHIE.
6. Governors and state legislatures should align to establish flexible financing mechanisms (e.g., pooling funds across relevant state agencies, bridge funding between federally funded programs) across public agencies and within state jurisdictional boundaries to develop and support electronic health information exchange and ensure that state data partners (e.g., Medicaid, public health, state employee health plans) can operationally and financially sustain electronic health information exchange for the purpose of it being a necessary public benefit and utility to improve public health and health care value to state residents.
7. States should provide public health and Medicaid agencies with resources necessary to train and hire workforce to support HIT/HIE competence and internal system modernization efforts.
8. States should establish quality, prevention and safety goals from which to base the development of their HIT/HIE infrastructure planning. States should then establish HIT infrastructure objectives to support these broader quality, prevention and safety goals.

“My vision remains the same — that high-quality affordable health care is available to every Coloradan. We can help make this vision a reality by working together, by working with broad coalitions that include public and private partners, and by working with bipartisan leadership that puts our future first.”

— Governor Bill Ritter announcing “Building Blocks to Health Care Reform” February 13, 2008

disease management, and health care quality comparison for consumers.

Health Information Exchange

A Nationwide Health Information Network (NHIN) is being developed to provide a secure, interoperable health information infrastructure that will connect providers and consumers. In 2007 and 2008, the U.S. Department of Health and Human Services awarded \$23.1 million in contracts to nine HIEs to begin forming the NHIN. This critical part of the national HIT agenda will eventually enable health information to follow the consumer, be available for clinical decision making, and support appropriate use of such information beyond direct patient care. The NHIN is administered by the ONC in the U.S. Department of Health and Human Services.

Nationwide HIE Prioritization: Leadership and Consensus for Implementation

The American Health Information Community (AHIC) was established within the U.S. Department of Health and Human Services in 2005 with the goal of establishing electronic health records for all Americans within 10 years. A successor to the AHIC was incorporated in 2008 as the National eHealth Collaborative (NeHC) as a public-private corporation and partnership. The NeHC intends to build upon progress already made in order to develop an effective, interoperable, and supportive health information system for the entire country. The ARRA established the Policy and Standards Committees as federal advisory bodies. It remains to be seen how the NeHC will continue to relate to its current charge in this new scenario.

State-level Strategies and Initiatives

Nearly all U.S. states are making progress on HIT initiatives through a range of approaches. To begin addressing issues such as interoperability and privacy, many have established a road map for using information technologies to drive health care reform in their state. Several important projects have engaged states and their HIT initiatives, including Colorado.

State-level HIE Consensus Project

Since 2006, the State-level HIE Consensus Project has studied the development of state-level HIE initiatives and helped to identify key characteristics and best practices for developing statewide HIE. Colorado has participated as part of the Project’s Steering Committee and benefited by lessons learned across the states.

The State-level HIE Consensus Project focuses on activities organized at the State-level to advance HIE. State-level is often confused with the work of state governments, who have important responsibilities related to promoting health and ensuring effective health care. However, the work of the State-level HIE Consensus Project reveals that state-level HIE entities have important and broader common features such as: a statewide mission for developing HIE; the involvement of public and private sectors and diverse statewide stakeholders; a scope of HIE activity that addresses the unique needs and characteristics of the local, statewide, and potentially regional health care landscape; and distinct roles to build consensus and deploy strategies that facilitate statewide

HIE implementation. A series of reports, recommendations and profiles of state-level HIE initiatives are available at www.slhie.org.

State Alliance for eHealth

The **State Alliance for eHealth**, led by the National Governor’s Association Center for Best Practices began in 2007 to engage state governments in understanding key opportunities for HIT development. The State Alliance has provided a forum for dialogue and produced recommendations to help advance a framework for individual state efforts. A majority of the State Alliance’s recommendations for state government roles and actions related to HIT coincide with the recommendations being put forward by the Colorado HIT Advisory Committee.

The Health Information Security and Privacy Collaborative (HISPC) was established by ONC in conjunction with the Agency for Healthcare Research and Quality and led by RTI International. HISPC engaged the majority of states in a consistent and simultaneous effort to analyze the statewide barriers to privacy and security, and to identify solutions for promoting safe and secure electronic information sharing. CORHIO was designated to lead Colorado’s participation in HISPC and has incorporated the HISPC findings and recommendations into its statewide plan for HIE privacy and security.

The National Conference of State Legislatures (NCSL) has actively monitored state health policy efforts related to HIT through its HIT Champions program and searchable legislative database. NCSL has produced a series of scans and analyses, the most recent of which profiles trends in state HIT policy efforts “Health Information Technology — 2007 and 2008 Legislation.”

¹ The Federal Role in Promoting Health Information Technology, David Blumenthal, MD. The Commonwealth Fund, Perspectives on Health Care Reform, January 2009

² “A Look Ahead: What Colorado Health Care Professionals Can Expect Under the Obama Administration,” M.D. News, Denver Metro Edition, Winter 2009



Establishing intrastate interoperability and RHIOs are two critical steps for both the federal and state governments to take.

V. OVERVIEW OF HIT IN COLORADO

Statewide Initiatives

With the Governor's Building Blocks for Health Care Reform and the Colorado Regional Health Information Organization (CORHIO) taking the lead, Colorado is on its way toward developing statewide HIT and HIE systems with numerous organizations, projects, stakeholders and funding initiatives. This report highlights current representative projects in Colorado, not all are included. These efforts encompass the actions of providers, consumers, and collaborative public-private projects to support EHRs, PHRs, registries, infrastructure, training and multiple other assets for developing HIT. A map of some current Colorado initiatives is presented in Diagram 1.

Colorado Regional Health Information Organization (CORHIO)

CORHIO is a non-profit organization created in 2007 by a coalition of interested individuals, health care providers, agencies, organizations and community leaders. These stakeholders collaborated to establish CORHIO as a statewide independent and neutral resource to facilitate HIE to improve the health and health care of all Coloradans. CORHIO is similar to statewide health information organizations across the country

seeking to develop interoperability, and to link providers, consumers, communities, and health organizations in meaningful HIE efforts. There are an estimated 4.7 million people in the state of Colorado and 10,000 practicing physicians. CORHIO's ultimate goal is to facilitate HIE across diverse settings and stakeholders. CORHIO is addressing important components required for statewide HIE, including establishing a secure infrastructure and the necessary legal framework for sharing clinical data, developing a master patient index, building an interface engine for clinical data acquisition from data repositories, hosting a secure web server application to display integrated clinical information, and providing an applications to display integrated clinical information.

- CORHIO's initial \$5 million grant came from a contract from the U.S. Agency for Healthcare Research and Quality (AHRQ) to demonstrate a federated Point of Care Inquiry System. This system allows four large, sophisticated health care organizations, The Children's Hospital, Denver Health and Hospital Authority, Kaiser Permanente Colorado and University of Colorado Hospital to retrieve information on a consenting patient in emergency rooms. Such information includes radiology

reports, laboratory reports, medications (prescribed and dispensed), EKG images, problem lists and registration information. An estimated 30 percent of Coloradans benefit from this data exchange capability.

- CORHIO subsequently developed its road map to serve as collaborator/convenor and, where necessary, provide or broker services to assure that all communities in Colorado can use HIE to improve care. This road map was confirmed by a broad community of HIE experts throughout the state attending the January 2008 HIT Summit cosponsored by the Colorado Office of Information Technology, The Colorado Health Foundation and CORHIO.
- As part of the Building Blocks for Health Care Reform, the State of Colorado has provided funding to CORHIO to expand HIE across the state. In addition to substantial in-kind investments from the four demonstration partners, direct funding has also come from The Colorado Health Foundation, Kaiser Permanente, United Healthcare, Rocky Mountain Health Plans and COPIC.

Center for Improving Value in Health Care

The Center for Improving Value in Health Care (CIVHC) is an inter-disciplinary, multi-stakeholder center established as one of Governor Ritter's Health Care Building Blocks that will identify and pursue strategies for quality improvement and cost containment. The center is led by the executive director of the Colorado Department of Health Care Policy and Financing. It will bring consumers, businesses, health care providers, insurance companies and state agencies together to develop long-term strategies for ensuring a better value for the billions spent annually

Diagram 1. Colorado HIE Initiatives



Source: CORHIO

on health care in Colorado every year. CIVHC has already established working committees that are moving forward to create meaningful projects that incorporate data acquisition, delivery system enhancements, alignment of financing and quality, and consumer engagement. All of these important initiatives will require HIT tools. CIVHC will help create the business case for adoption and expansion of HIT efforts in Colorado.

Prescription Drug Monitoring Program

Beginning in 2008, Colorado physicians have had access to a computerized database of prescription drug and patient information to help them identify patients who might be abusing prescription drugs. Pharmacists have begun uploading information into the Prescription Drug Monitoring Program (PDMP) database which is accessible to physicians. The database includes patients' names, who prescribed the medication, which pharmacy dispensed the drugs, and any other data necessary to determine if a patient has gone to multiple doctors or locations to obtain the drugs. At present, 1,174 pharmacies currently submit data into the program. There are 4,770 providers registered to query data in the PDMP, including physicians, optometrists, physician assistants, pharmacists, podiatrists, advanced practice nurses, dentists and veterinarians.

In 2005, the Colorado state legislature passed a law to create the database, which is led by the Board of Pharmacy under the State of Colorado Department of Regulatory Agencies. The statute does not require that physicians or pharmacists call law enforcement if a patient is suspected of "doctor shopping," but they can use the information to intervene and provide a course of treatment. In the course of an investigation, law enforcement officials can gain access to the database by obtaining a court order or subpoena. The State received federal funding in 2006 to operate the database, which costs \$200,000 annually. The program will be up for legislative review in 2011.²

Newborn Screening and Information Delivery

This HIE for delivering newborn screening results to clinical practices generates notices for follow-up that are communicated to local public health agencies via a case management system. Its lead organization is the Colorado Department of Public Health & Environment (CDPHE) and it is funded by the Robert Wood Johnson Foundation. The project builds on a major effort at CDPHE that has developed an integrated surveillance system for identifying special needs children. The project will involve multiple health information exchanges all at different stages and examine issues that arise across them, in order to create protocols and standards for additional exchanges.

Colorado Immunization Information Service

The Colorado Immunization Information System (CIIS) is the electronic statewide system for reporting immunization information. Greater accessibility to and from this database can lead to improved vaccine rates and reduced vaccine-preventable disease.

To promote this greater accessibility, a recent grant from the U.S. Centers for Disease Control offers support to create data flows to CIIS and return important immunization health information to clinicians either through a web browser or to their electronic medical record (EMR). The grant allows CIIS and CORHIO to test a standard message protocol (HL7), a federally developed messaging standard for sharing immunization information. Participants in this project initially include the CDPHE, CORHIO, The Children's Hospital, Quality Health Network, Banner Health Systems, MCPN, the Indian Health Service, and others.

HIT Survey

For the 2006 Technical Assistance and Services Center (TASC) HIT Survey, TASC surveyed, 14 critical access hospitals in Colorado to identify their use of HIT. Here is a summary of the survey results from Colorado:

- 93% have funding included in their budget for purchasing information technology
- 6 out of 14 hospitals said their clinicians use hand held computers/ PDAs
- 0% of the hospitals surveyed have nurses using hand held PDAs
- All hospitals have internet access (93% high speed, 29% wireless)
- 71% of hospitals said they have encrypted secure e-mail access for all staff to protect patient confidentiality
- 93% have computerized claims submissions and 100% have computerized patient billing
- 100% have computerized registration and admission
- None of the hospitals use bar-coded patient identification bracelets
- 79% of hospitals surveyed do not use electronic medical records
- 21% keep physician's notes and 0% keep vital signs records in electronic format
- 57% of hospital pharmacies have computerized allergy and drug interactions and 29% have computerized dose recommendations
- 57% have computerized clinician review of radiology results
- 11 out of 14 hospitals use teleradiology technology to transmit images electronically
- 50% of the hospitals transmit EKG tracings electronically to clinicians at other sites
- 50% of hospitals do not share clinical data with selected other departments within the hospital
- 36% of hospitals surveyed have physician offices or clinics connected electronically to the hospital's information system
- 43% have long-term care facilities connected electronically to the hospital's information system
- 14% of the hospitals share clinical data electronically with other hospitals¹

“We have many successful regional efforts underway in Colorado, which have shown that electronic health records can improve outcomes for patients and save money for the health system.”

— Bill Ritter, Jr., Governor of the State of Colorado¹

Bio-surveillance Early Warning System

Colorado implemented a bio-surveillance system during the 2008 Democratic National Convention based in Denver. Bio-surveillance is the process of looking for emergency room patterns that might indicate naturally occurring events or bioterrorist acts. It is designed as an “early warning system” to help public health officials identify and respond to such incidents as early as possible.

The Colorado Hospital Association, with member hospitals in the Denver metro and Colorado Springs regions, as well as local and state health officials encouraged hospitals to participate in the system. Following a model developed by the CDC, staff at CDPHE built the analytic tools to implement the system using 11 different syndrome categories. Data were received, processed and reported daily for review by public health and hospital officials.

CORHIO was used as the secure bio-surveillance portal for review by public health officials, hospitals and health care systems in the Denver metro region. During the event, there were several minor “spikes” of syndromes (i.e., respiratory and meningitis) which were evaluated and found to be naturally occurring and consistent with typical seasonal patterns.

Twenty contributing hospitals could securely view daily community surveillance reports. Public health and hospital officials will review the value of the system after 2008 to determine whether to continue with these bio-surveillance efforts. The infrastructure will remain with CORHIO.

Regional Initiatives

HealthTrack

The El Paso County multi-agency Health Track program is headquartered in Colorado Springs. The anticipated outcomes of this internet-based system include increasing enrollment in public health insurance and raising patient quality of care through improved timeliness, coordination, and

cultural appropriateness. It accomplishes these objectives by allowing community partners to help individuals apply for public benefit programs, allowing providers to bill for care provided, helping providers make needed referrals, minimizing disparities, and reducing the time clients spend completing paperwork. HealthTrack also shares information about previous visits at partner agencies to improve the continuity of care and avoid duplicating tests.

The system’s functionality offers application tracking, interagency communication, community statistics data collection, medical history summaries, custom reporting, benefit management tracking, and chronic disease management. To further improve the quality of care, work is underway by these agencies to add medical care guidelines to HealthTrack so that regardless of where a client is seen, the same standard of care is used. In addition, because a person’s health depends in large part on what she or he does every day, a patient portal is being added to HealthTrack that will allow a person to obtain their own records and track personal health information.

Its members include the El Paso County Department of Health and Environment, El Paso Department of Human Services, two local hospitals (city-owned and private), faith-based clinics, and community health centers. HealthTrack is a significant community benefit because it provides a much better understanding of their uninsured community members’ health needs and how this population changes over time. As a whole, these data are useful in planning for the expansion of medical services and for addressing local health system problems that adversely affect access to health care.

Quality Health Network

Quality Health Network (QHN) is a non-profit quality improvement collaborative based on the western slope. It was initially funded and founded in 2004 by Hilltop Resources, Community Hospital, St Mary’s Hospital, the Mesa County Independent Physicians Association, and Rocky Mountain Health

Plans. The network’s ongoing funding is provided by participants utilizing the system (physicians and payors (25 percent each) and hospitals (50 percent). The organization successfully launched live operations of its secure and private electronic HIE infrastructure in 2005.

The goal of this information exchange project is to electronically unite western Colorado’s many disparate providers into a “virtual clinic” in order to integrate care and to provide clinicians with access to electronic tools for improving efficiencies and outcomes for patients. Mesa County’s acute care facilities and more than 85 percent of treating providers encompassing ambulatory care, acute care facilities, surgery centers, urgent care, behavioral health, home health, extended care, pharmacies, hospice, public health and other providers are currently connected via the network. The QHN system provides its users with access to its EMR software, electronic prescribing functions, clinical summary information on patient medication, allergy, immunization, and problem lists, chronic care management tools (registries), and clinical decision support tools to help improve provider efficiencies as well as improve the quality of care for area patients.

Authenticated participants are able to securely send and receive encrypted patient medical records to treating providers via the private network’s high-speed infrastructure. These medical records are all based on a master patient index containing demographic information on 450,000 patients. More than four million patient diagnostic tests and other relevant patient data have been electronically routed to treating physicians since the network began operations. Additionally, the network routed more than 367,000 electronic prescriptions to area pharmacies as of December, 2008. Upon completion of the QHN expansion throughout the 40,000 square mile region, more than 1,000 physicians and 10 more area hospitals will join the network.

North Colorado Health Alliance

The North Colorado Health Alliance (NCHA) is a community-based collaboration among Weld County safety net organizations providing health care services to low-income, uninsured residents. The Alliance's mission is to assure that all underserved residents have access to affordable, comprehensive, quality health care. NCHA serves as a convener, facilitator and integrator of health care in the region working with health care partners to expand access, improve quality and eliminate disparities in health care for vulnerable populations.

Toward that goal, the Alliance is developing an electronic communication network to encourage dialogue among members and enable information sharing. Additionally, the Alliance is working with two local technology providers to build a remote access database. This population database will support data collection, analysis and research to enhance rural health services in the region.

Other Initiatives

Colorado Clinical Guidelines Collaborative

The Colorado Clinical Guidelines Collaborative (CCGC) is a non-profit coalition of over 50 organizations including clinicians, hospitals, health plans, employers, consumers and others working together to help implement a safe, effective, optimized health care system for all. Through various local and national initiatives such as Improving Performance in Practice (IPIP) and Patient Centered Medical Home (PCMH), CCGC works with individual practices and communities to help them transform care delivery to improve quality and safety, reduce costs, and increase satisfaction

for patients and their health care team. An important HIPAA compliant web-based tool used in these initiatives is ReachMyDoctor, whose features include:

- **A Secure Common Communication Platform** — to facilitate intra/interoffice communication and enable coordination of care among primary care clinicians, specialists, hospitals, nursing homes, patients and many others.
- **Patient Engagement Tool** — to educate and engage patients in their care through personalized care plans with target goals (such as for cholesterol levels). It offers: automatic reminders to notify patients when they are due for needed services; storage and portability of personal health information; plus, ability to make online appointments, request prescription refills, and communicate with their health care team.
- **Care Plan Management (Registry)** — a mechanism to track personalized care plans to determine who is and who is not getting needed care, and to reach out to those still needing services. This registry also helps practices determine what percentage of their patients is receiving optimum care according to evidence-based guidelines and improve systems when deficiencies are identified.

CCGC has been able to make this tool available to physicians across the state at low or no cost.

Integrated Physician Network Avista

The Integrated Physician Network Avista (iPN Avista) has been established as a non-profit organization. The information network is an initiative designed to improve health care services for individuals who are uninsured or have Medicare and Medicaid. It is one of the first organizations in the nation to build an electronic patient information network linking a community health center and its low-income patients with the private practice community. The number of covered lives in the iPN Avista coverage area is 60,000; and, the number of total patients in the area is 300,000. There are 400 practicing physicians in the network area.

iPN Avista uses an electronic medical record (EMR) system to link Clinica Campesina Family Health Services, a Federally Qualified Health Center (FQHC); Colorado Access, a Medicaid, Medicare and Child Health Plan Plus HMO; Avista Adventist Hospital; and independent physicians from 14 private practices at 19 different sites. Boulder County Public Health is also involved in the initiative.



As part of its development efforts, the organization worked with their EMR vendor's system so that it will provide real-time decision support. By creating a complete longitudinal patient record, iPN Avista allows participating physicians to immediately access and share patient data, including demographics, referrals, medications, allergies, diagnosis, procedures, alerts, laboratory and radiology reports through a secure internet portal. This level of data access will help specialists treat patients who typically have trouble accessing their services, namely those who are uninsured or have Medicare or Medicaid.

Colorado Associated Community Health Information Exchange

The Colorado Associated Community Health Information Exchange (CACHIE) is a collaborative project of Colorado Community Health Network and Colorado Community Managed Care Network (CCMCN). CACHIE receives funding from the Health Resources and Services Administration (HRSA), the Agency for Healthcare Research and Quality and The Colorado Health Foundation. Through CACHIE, Colorado community health centers (CHCs) are joining forces to create a shared information technology system to support quality reporting, analysis, and improvement.

Its goal is to promote the use of interoperable HIT to support quality reporting and improvement across the CHC networks. This project will identify ways to share experience and knowledge gained; share costs and collectively design a system that serves multiple CHCs. Specific quality reporting features will support: 1) clinic-based rapid cycle improvement efforts, 2) HRSA-sponsored reporting for health disparities collaborative work and 3) information needs for CHC advocacy and value-based reimbursements.

CACHIE initially worked with EHR-enabled CHCs to develop appropriate policies to share information. CACHIE will use technology to extract data, securely transmit it to a data repository, standardize the content, and generate reports to address the functions outlined above. Lessons learned from this effort will be shared with those clinics not yet using an EHR to inform and guide future planning efforts to enable them to benefit from the collectively developed tools.

The Colorado Health Foundation — Healthy Connections

In an effort to improve efficiencies in the health care system, reduce the rate of preventable medical errors, and close the gaps in the delivery of quality care for underserved populations, The Colorado Health Foundation established Healthy Connections. Healthy Connections is a multi-year initiative designed to improve the HIT capacity of providers serving low-income, uninsured Coloradans. Entering its second year, Healthy Connections has awarded 21 grants totaling close to \$2.5 million for advancing HIT in Colorado.

The Foundation's Phase 1 Healthy Connections grantees encompass a variety of safety-net health organizations. A few of the grantees accomplishments include:

Clinica Campesina provides primary care to underserved residents of south Boulder, Broomfield and western Adams counties. An existing practice management system was obsolete and Clinica Campesina believed EHRs would improve quality of patient care. With a new EHR funded by the Foundation, their quality of care greatly improved. Instead of using multiple spreadsheets to record patient data, the patient data process is now automated. The EHR has also created multiple disease registries; and, the implemented technology is helping attract new physicians.

Doctors Care has more than 529 participating physicians. It provides a medical home for 4,300 children and adults in south metro Denver. Their existing practice management system was outdated and Doctor Care needed to evaluate HIT needs. With Foundation funding, their IT staff is now in place and the organization has a three-year hardware refreshment plan to accommodate new software purchases.

Fort Collins Family Medicine Center provides care to 12,000 underserved patients in the Fort Collins area. The Center has had an EHR system since 2005, but it was under-utilized due to lack of training. This training, funded by the Foundation, did not significantly interfere with their daily workflow. One hundred percent of physicians in the Center are now using EHRs to provide patients with more comprehensive, better quality care.



High Plains Community Health Center

serves an average of 7,500 patients per year in southeast Colorado. It had a productive HIT system in place but needed Foundation assistance to hire an HIT coordinator to optimize its use. Now the Center has reporting tools that allow staff to extract the data needed for quality assurance, audits, reports and providing planned care to patients.

Mountain Family Health Center

is a Federally Qualified Health Center (FQHC) that serves 8,700 people in the Glenwood Springs area. Previously it used paper records for data collection. As an FQHC, it knew EHRs would be required in the future. With help from the Foundation, it now has a fully operational EHR and is well on its way to developing reports for decision making. The Center's EHR system has also been a model for smaller clinics in the area.

Pueblo Community Health Center provides a range of services to 18,300 patients at five clinics in the Pueblo area. It had multiple EHR and practice management systems, leading to redundancy and errors. Through the Foundation grant, these HIT systems are now optimized, enabling staff to gather data from various systems to identify pressing health concerns in the community, and to better care for and educate patients.

Valley-Wide Health System serves 44,600 patients at 18 sites in 12 rural counties. All clinic EHRs in the System were not compatible with a main practice management system. They needed to adopt and sustain an efficient HIT system. With Foundation grant funds, staff at all 18 clinics have received basic computer training; electronic schedules can be accessed from any clinic site; and, the system is now providing data for reporting.

Colorado Access

This HIE project to enhance provider-member-plan communications is an internet-based portal. Denver metro area providers are able to actively manage patient care and ultimately provide a higher quality of health care. Providers can access a suite of functions, including patient service and pharmacy data; practice level trending and querying; communicate securely between providers; and conduct administrative functions such as claim submission, referral; and authorization submission. The integration of tools such as evidence-based guidelines and decision support access will enhance the effectiveness of the care provided. Members will have access to educational materials, plan and provider information, and community resources.

Colorado Access has adopted a strategic plan to leverage technology and information management to deliver high quality, low cost care and become an innovator in the provision of integrated health services for Medicaid members. The development of a robust communication vehicle between the providers, members, and the plan, is critical to achieving these goals. Colorado Access believes that creating an easy to use environment that gives providers the clinical data and tools necessary for care coordination will assist primary care practitioners in providing a medical home for their members.

Colorado Telehealth Network

The Colorado Hospital Association (CHA) and the Colorado Behavioral Healthcare Council (CBHC) are embarking on an initiative to create a statewide high-speed fiber optic data transmission network for health care providers. The goals of this network are to improve quality, increase access and reduce the costs of health care in the state. This three-year initiative will establish one of the country's largest and most complete

telehealth networks. As of January 2009, 388 eligible participants have been identified. Rural hospitals, metropolitan hospitals, rural clinics and mental health care clinics have all signed letters of agency stating their interest in participating in the Colorado Telehealth Network.

Stemming from a Federal Communications Commission Rural Health Pilot Program, CHA and CBHC have received \$9.8 million in federal funding with a 15 percent match from participating health care providers. The Network has an overall budget in excess of \$11 million to be spent supplying broadband connectivity for rural hospitals, clinics and mental health clinics to transmit data between health care providers. The Network will support video conferencing for medical consultation and the transmission and receipt of data for the broad range of clinical and informational needs of health care providers. It also offers access to inter-state and intra-state medical education and telemedicine. Once established, the Network will provide a backbone of infrastructure to allow other telehealth initiatives to participate in HIPAA compliant data transfer.

Currently, the Network is developing a rural health care pilot program to help public and non-profit providers construct a broadband network to provide telemedicine services. This program will help bring health service to those some of the most acute needs. Support for the Network initiative comes from many organizations including the State of Colorado, CORHIO, the University of Colorado's Health Sciences Center, Banner Health, Exempla, Poudre Valley Health Systems, and NCAR.

¹ "A Look Ahead: What Colorado Health Care Professionals Can Expect Under the Obama Administration," M.D. News, Denver Metro Edition, Winter 2009.

VI. COMMITTEE FINDINGS AND OBSERVATIONS

Based on the Committee's examination of the emerging HIT landscape, there are numerous benefits created and enabled by HIT. In addition, there are broad, positive outcomes of electronic health systems which vary by stakeholder and technology. Input provided to the Committee by Colorado stakeholders identified the primary benefits as:

- Prevention of errors and duplication of treatment
- Reduced costs
- Creation of a virtual medical home
- Increased Accessibility
- Fewer prescription errors
- Clinical decision support to facilitate treatment

Positive Accomplishments Across Colorado

Despite the complexity surrounding HIT, a foundation for building an effective statewide electronic health information system in Colorado has been laid by the concerted efforts of early HIT leaders. Implementation efforts are making headway through a range of projects taking place among public-private consortiums at the provider, community and statewide levels with support from the health care industry, state and federal grants and contracts. Leadership and support from Colorado's governor, legislature, health agencies and leading health foundations have also been primary drivers of this early adoption.

Major accomplishments include:

- Provider and community-based efforts to adopt HIT systems and implement HIE have taken hold and are developing in key regions such as the western slope, northeast Colorado, the San Luis Valley, and among important provider groups such as community health centers, behavioral health providers, large independent physician practice associations, and major health systems. These efforts demonstrate grassroots support for HIT and health care innovation, and serve as foundational components for building statewide HIT and HIE capacity.

- CORHIO, an organized, independent multi-stakeholder public-private sector collaboration, is in place to provide collaborative stakeholder HIE governance (not regulation) and services and to facilitate coordinated statewide strategies to develop, implement and sustain a statewide HIE.
- Colorado's efforts to date are aligned with models and strategies being deployed across other states and coincide with evolving federal HIT strategy. Colorado HIT leaders have benefited from being able to participate in nationwide HIT initiatives by incorporating real time guidance and resources, and increasing understanding of emerging best practices, issues and challenges.

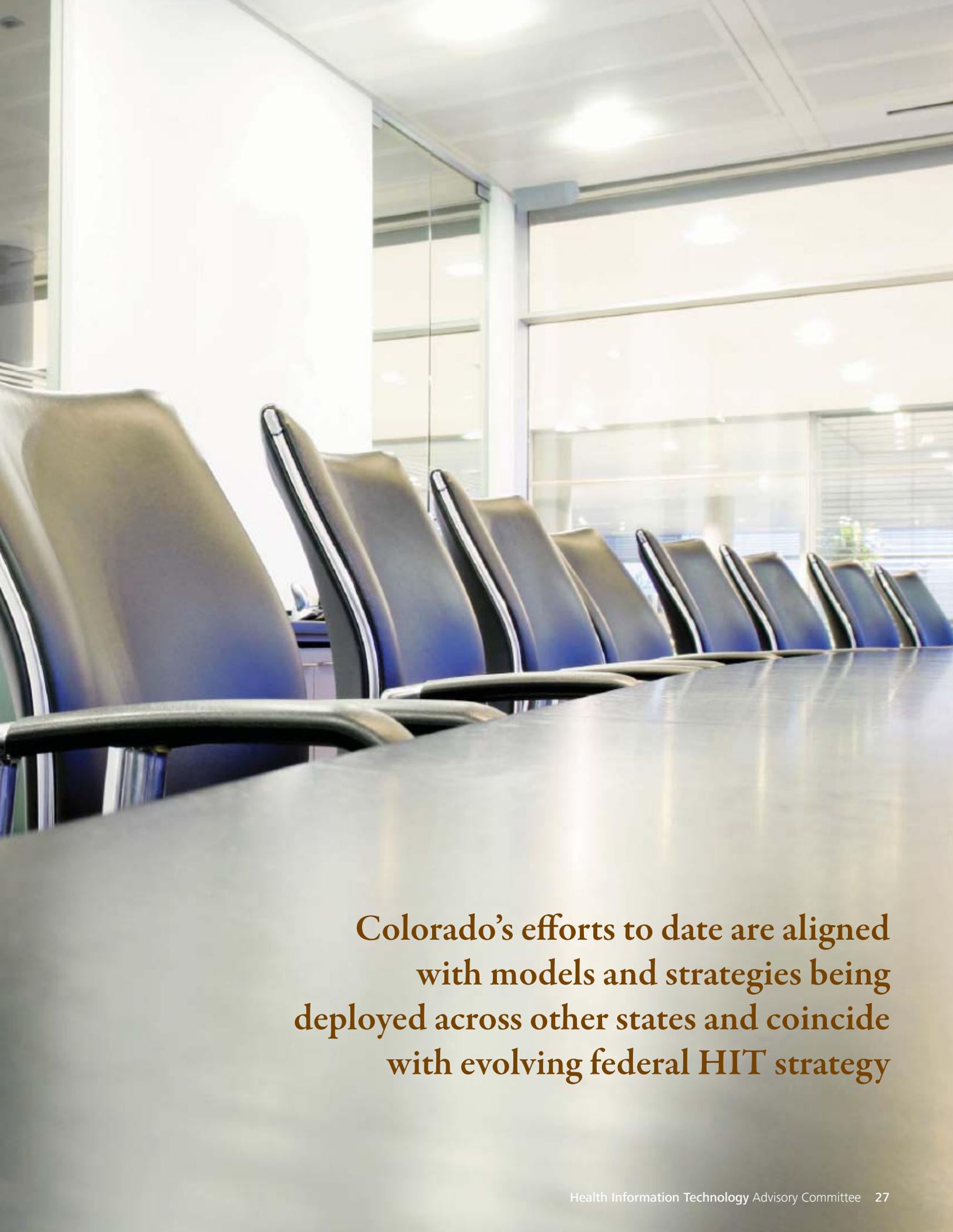
Overall, with the recent successful launch of CORHIO's live data exchange supported by the leadership of Governor Ritter as part of the Building Blocks for Health Care Reform, plus State legislature efforts such as Senate Bill 196, and diverse individual initiatives, Colorado is well-positioned to respond to HIT opportunities emerging as part of the new federal American Recovery and Reinvestment Act.

Challenges in Advancing the Nature and Pace of HIT Adoption and HIE

Despite this level of progress, Colorado like other states, has also experienced a range of challenges in achieving HIT adoption and HIE implementation to the levels of scale or "critical mass" necessary to reap the full benefits of HIT. Based on input from Colorado stakeholders, the Committee's observations about the nature and pace of HIT adoption and HIE implementation include:

- There is currently an uneven business proposition for HIT that creates challenges in raising levels of HIT adoption and HIE implementation. Incentives for investing the time and resources necessary to adopt HIT are uneven across stakeholders and in some cases are negative because the economic benefits of HIT implementation are not realized directly by providers or patients.

- Providers are at various stages of readiness and capacity for investing and fully using HIT technologies. There are a range of EMR systems that offer different degrees of functionality. Some failures in provider HIT adoption have resulted from mismatches between needs and products and implementation support. Given requirements for successful HIT adoption, it is important to set priorities for acquiring core HIT functionalities that will support patient and provider needs. Strategies for increasing provider HIT adoption will need to accommodate a range of EMR functionalities because attempting to get all providers to initially adopt full-scale EMR's may not be cost-effective nor successful in improving health care delivery.
- HIT adoption strategies need to be linked to achieving HIE and demonstrating quality improvement. Already, improvements in quality of care through HIT are especially noticed by patients being treated outside of their regular provider network. This benefit notably arises from HIE which provides more efficient information exchange. The nature of Colorado's health care marketplace is such that physicians, hospitals and pharmacies are not generally practicing as part of integrated business units. Organizationally, there is not a common structure for communication among different providers and among providers and patients as they make transitions of care across providers and systems. A road map to achieving HIE in Colorado should target EHR usage and include HIT functionalities such as patient registries, and expansion of statewide HIE and e-communication strategies that deliver the most value in improving health care quality and efficiencies.



Colorado's efforts to date are aligned with models and strategies being deployed across other states and coincide with evolving federal HIT strategy

- Documented measurable benefits of HIT are difficult to find across the continuum of health care as the relatively early stages of HIT adoption and HIE implementation have made robust impact studies premature. While there are examples of cost savings and improved care at the clinical level within particular community HIE settings, or health care systems, the large savings numbers identified in major studies based on projections for widespread HIT adoption have not yet been achieved or documented. Nonetheless, it is important to set some targets and to foster evaluation efforts for measuring the evolving impacts from HIT adoption and HIE.
- Increased education on the benefits of HIT across all stakeholders and the general public will help build inroads towards greater collaboration, funding, implementation, and adoption. Many patients already think that health care information is electronic, but they are neither aware of the lack of, nor the importance of, the connectivity of their health services data. Currently, there is a very low level of consumer involvement in using HIT for personal care management. HIT and HIE development and funding efforts to date have primarily been directed toward provider-based infrastructure and networking. However, with promotion from the State and education of stakeholders, consumers could drive adoption rates, increasing expectations for HIT use placed on providers based on their own direct access and positive experiences with HIT.
- There are numerous levels of HIT and HIE activity. Federal, state, public and private groups working in similar, and often overlapping, areas of HIT and HIE development. The federal HIT strategy has focused on developing key cross-cutting elements required for a nationwide health information network. These include efforts to develop standardization that can improve the reliability and value of HIT products, advance connectivity with common data specifications, and foster collaborative agreement on priorities for developing nationwide HIE. While these efforts are

important for achieving a fully functioning system, they have not yet resulted in widespread understanding and application across states where models for building HIE are emerging based on practical opportunities and resources available. In light of current federal initiatives, there is a great opportunity for the State of Colorado to take advantage of HIT-targeted federal funds and leverage the combined efforts of CORHIO and State leadership.

- Achieving an effective statewide system for electronic health information with HIT functionalities and interoperability in place to serve the full range of stakeholders is inherently collaborative and involves multi-sector strategies. It is important to balance the appropriate roles and investments across state government and the public and private sectors. As part of the health care marketplace, HIT is advancing in certain areas where a sound business case is clear, i.e., automating health care processes for greater efficiency especially in larger health systems.
- Government should not get in the way of such progress. Instead, it should support and promote interoperability by helping to address incentives and other mechanisms that will drive adoption and use of HIT and HIE. Such State involvement will help go beyond what stakeholders can achieve individually within their health care business operations. Moreover, State governments have roles to play related to ensuring privacy protections and ultimately, to make sure that HIE serves all citizens.
- Government efforts to legislate and regulate HIT should be made very cautiously, given the nature of the HIT landscape. Flexibility is needed to adapt in this rapidly changing environment. Legislated mandates may create unanticipated consequences that hamper further advancements. However, the State does need to incorporate

incentives for HIT adoption and HIE implementation into policy making in order to leverage current accomplishments and to respond to emerging opportunities such as those under the federal stimulus legislation.

Currently, there is a very low level of consumer involvement in using HIT

The challenges are numerous and multifaceted on Colorado's road to a statewide HIT system. Reducing these hindrances to the development of a fully interoperable health information system, requires collaboration, communication, trust and perseverance among all stakeholders. As anticipated, cost, technology adoption and interoperability, and privacy concerns are at the forefront of issues facing the State of Colorado.

Costs The most frequently identified challenge in developing electronic health information projects is cost. Hardware, software and training are often significant expenses. Opportunities for sharing expenses, reducing costs and building efficiencies should be exploited by the State and stakeholders. Additionally, pursuing grant funds and lobbying for federal monies are important roles. Designing a funding model should be one of the first tasks of the State governing authority.

Technology Adoption and Interoperability One of the most significant stumbling blocks to robust HIE is the provider's difficulty in purchasing and implementing products, especially with adequate interoperability capacity. The lack of standardization in certified software tools and uncertainty about purchasing decisions are putting many HIT purchase orders on hold as stakeholders are adopting a "wait and see" attitude, instead of adopting existing technologies. CORHIO's

Government should not get in the way of progress ... instead, it should support and promote interoperability.

coordinating role can help stakeholders identify HIT interoperability requirements and available resources that are appropriate for stakeholders, thereby contributing to successful HIT implementation and sustainability across Colorado.

Information technology is inherently in a constant state of evolution and upgrades. Likewise, HIT is changing rapidly. The technology and tools that have been selected by many initiatives within Colorado are already outdated. This situation leaves them facing strategic financial and programmatic questions regarding interoperability and how to best serve participants.

These factors have impacted adoption of advanced clinical decision support tools. The low adoption rate of EMR, Computerized Physician Order Entry, PHR, and other technologies is due to a variety of reasons. Organizations have had difficulty developing clinical practice guidelines. The lack of standards has also mired inclinations for adoption. Furthermore, there is poor support for clinical decision support (CDS) in

commercial EHRs, often due to challenges integrating CDS into the clinical workflow. A limited understanding among stakeholders of organizational and cultural issues relating to clinical decision support is also a constraining variable.

Statewide Broadband Access A sometimes overlooked technology issue is that many providers and patients do not have ready or cost-effective access to broadband internet service. The primary reasons are location and cost. Geographically, Colorado is primarily rural. Outside of the Front Range region and the I-25 and I-70 corridors, broadband is not available in many areas. Cost is another major reason many may not have this level of internet service critical to HIE. Ironically, lacking broadband connection may be disproportionately true for safety-net individuals who have some of the greatest needs for health care support.

Security and Privacy Concerns around privacy are frequently cited as an obstacle to the robust sharing of personal health information. However, the exchange of

medical records between providers and the use of this information to monitor and improve patient outcomes requires sharing data to achieve the expected benefits.

The Health Information Portability and Accountability Act (HIPAA) establishes requirements for the security, use and disclosure of an individual's protected health information. It also provides patients certain disclosures and rights regarding the use, access and accuracy of such information. The law generally allows providers (after notice to their patient regarding their privacy policy) to share information for medical treatment, claims adjudication and payment purposes. Providers are not required to obtain a patient's consent for these purposes. Patients have a right to a copy of their health records and to request changes for inaccurate or incomplete information. The key privacy principles of HIPAA are presented in Table 1.

There appears to be widespread confusion around HIPAA requirements and protections. Providers often believe the restrictions on sharing health information are more onerous than the law actually requires and are worried about legal liability. Conversely, patients often believe HIPAA protects their personal information more than it does or that it requires their consent to share such information. On one hand, many providers want more certainty regarding their obligations and liability. On the other hand, certain patients want more control over who has access to their information, which information is shared, tracking of which data was accessed, and/or how it is used. Conflicting or inconsistent federal and state rules cause providers to be very conservative and not share information rather than risk noncompliance or liability. Finding the right balance will be required to protect patient rights and to increase the exchange of information without stifling restrictions. However, patients that have privacy concerns may be less concerned if they are in an emergency situation and their care provider needs access to their medical history in order to prevent potentially dangerous treatment (e.g., drug allergy or interaction).

The issue of ownership of health information also creates confusion and competing claims of right of use. Providers generally assert that the records they create (manual or digital) including their notes and diagnosis

HIPAA Privacy Rule Principle	
Uses and disclosures	Provides limits to the circumstances in which an individual's protected health information may be used or disclosed by covered entities and provides for accounting of certain disclosures; requires covered entities to make reasonable efforts to disclose or use only the minimum information necessary to accomplish the intended purpose for the uses, disclosures, or requests, with certain exceptions such as for treatment or as required by law.
Notice	Requires most covered entities to provide a notice of their privacy practices including how personal health information may be used and disclosed.
Access	Establishes individuals' rights to review and obtain a copy of their protected health information held in a designated record set. ^a
Security^b	Requires covered entities to safeguard protected health information from inappropriate use or disclosure.
Amendments	Gives individuals the right to request from covered entities changes to inaccurate or incomplete protected health information held in a designated record set. ^a
Administrative requirements	Requires covered entities to analyze their own needs and implement solutions appropriate for their own environment based on a basic set of requirements for which they are accountable.
Authorization	Requires covered entities to obtain the individual's written authorization for uses and disclosures of personal health information with certain exceptions, such as for treatment, payment, and health care operations, or as required by law. Covered entities may choose to obtain the individual's consent to use or disclose protected health information to carry out treatment, payment, or health care operations, but are not required to do so.
Source: GAO analysis of HIPAA Privacy Rule.	
^a According to the Privacy Rule, a designated record set is a group of records maintained by or for a covered entity that are (1) the medical records and billing records about individuals maintained by or for a covered health care provider; (2) the enrollment, payment, claims adjudication, and case or medical management record systems maintained by or for a health plan; or (3) used, in whole or in part, by or for the covered entity to make decisions about individuals.	
^b The Security Rule further defines safeguards that covered entities must implement to provide assurance that health information is protected from inappropriate use and disclosure.	

Source: GAO Testimony on Health Information Technology, 07-988T, June 19, 2007

are “owned” by them while acknowledging patient’s rights to access and copies. Providers need to be able to retain their records to support billing, insurance claims, diagnosis and future care. In contrast, patients often assert that their personal information is just that, their information that they own. This issue of ownership is further complicated when information is shared (i.e., duplicated or transferred) and stored in multiple locations, particularly when this exchange is done electronically.

A large amount of personal health information is already transmitted electronically. Virtually all providers share information electronically with payers for billing purposes. Additionally, most pharmacy records are stored and transmitted electronically. Large health systems and affiliated physicians share common patient information today. Lab and X-ray results are frequently transmitted electronically. All this is being shared under existing laws and regulations, suggesting that significant new privacy laws are not necessary.

Privacy protections are only as good, however, as the security protecting personal information. With the ability to restrict access, require passwords and encrypt data, electronic information can be more secure than paper

records. Yet, a security breach of electronic information may easily involve tens of thousands of patients. Moreover, the ability of such breaches to spread rapidly is substantially increased through electronic technology thus hindering containment. Tighter security adds cost and potentially restricts authorized legitimate use. Security breaches of electronic information also could result in significantly greater legal liability. Establishing standards and governance for providers sharing data is essential to build trust and to minimize security and liability concerns.

Health Care Reimbursement and Cost Sharing Framework The benefits that may be achieved with HIT are perceived to accrue primarily to the payor while the cost of adoption falls primarily on the provider. Collaborative ways to better share both cost and benefit will help accelerate adoption across the board. A current disadvantage to provider adoption is that payers will benefit by eliminating duplicate tests and procedures, yet provider revenues are usually based on those tests and services provided. Conversely, significant practice efficiencies are being demonstrated by utilizing EMR and HIE. Achieving these efficiencies requires changes in provider workflow but can render significant benefits for the practitioner.

Senate Bill 196 clarified that patient records transmitted electronically are subject to the same patient accessibility, security and privacy laws and rules as other patient records.

Stakeholder Adoption Although there is significant support for the potential quality and efficiency benefits achieved through the use of electronic information in health care delivery, adoption of HIT has been slow compared to similar technology adoption by other industries. There are many reasons why the adoption rate of stakeholders has lagged:

- Lack of awareness of the availability of HIT interoperability standards.
- Consumers either believe health care providers are already using HIT to deliver health care, as some national studies indicate, or are not aware of the protections taken to safeguard their personal medical information; and, they are reluctant to adopt PHRs and demand that their providers adopt HIT.
- Initial investments required by providers are cost prohibitive.
- Confusion over HIPAA requirements and protections.
- Impact on provider’s work flow and lack of technology expertise in smaller practices.
- Providers don’t see the financial benefits to their practices of streamlining their business with HIT and providing better continuity of care. Providers are concerned about costs but, more importantly, many see HIT as disruptive to their face-to-face contact with patients.
- Consumers and employers have not been engaged in the dialogue to promote HIT adoption. They have not been exposed to the dangers and failures due to the lack of HIT, nor to the costs or benefits of HIT.



Opportunities and Incentives

Stark Law Issue One issue specific to continuing incentives for physicians to purchase EMRs is the Stark Law — Safe Harbor Regulation. It provides an exception for anti-kick back rules which allow hospitals and health systems to subsidize up to 85 percent of EMR costs for physician practices. This is a tremendous incentive for many providers who would not have been able to afford such systems.

If nothing is done to renew or extend this regulation, it will expire at the end of 2013. Colorado hospital systems have already started rolling out EMRs to practices and will still be implementing those roll outs when the Safe Harbor law is set to expire. Practices would then have to assume 100 percent of the cost to maintain these systems or purchase new ones. Most physician practices cannot afford that cost in today's market without assistance from larger systems, hence the poor rate of adoption of EMRs by such practices. Perhaps more compelling, practicing physicians generally do not have the capacity to manage information technology such as hardware, software, upgrades, vendor contracts, wired- and wireless- networks, support, etc. without assistance. If the Safe Harbor law expires, it is possible that many will discontinue use of electronic systems, negating many of the gains made.

American Recovery and Reinvestment Act This federal stimulus bill enacted in February 2009 designates funding to the states specifically for implementation of HIT systems. It is discussed further in this report's Post Script.

Building Blocks for Health Care Reform Introduced by Governor Ritter, this 2008 State initiative addresses systemic health care reform in Colorado and will be significantly supported by HIT systems such as EHR and PHR, functional tools including registries, and the development of HIE.

Medicare Mandated E-prescribing will stimulate a broad increase in HIT adoption. Therefore, establishing a deadline for Medicare providers and patients to use e-prescribing will be an important step for the State. Medicare began providing incentives in 2008 for e-prescribing.

Private Sector Initiatives Commercial businesses' ability to make significant upfront investments, apply varying business models, and breed competition has accelerated the development and deployment of HIT solutions. These market-based ventures can readily support current public-private stakeholder initiatives and expand the scope of HIT adoption and HIE implementation. Products and innovations from Microsoft, Google, Covisint and other industry leaders are providing technology options that appear very promising to the advancement of interoperability and support of PHRs. Commercial initiatives will likely contribute to the resolution of interoperability issues, help overcome the lack of standards, and evolve new technology.

The value of private sector technologies is that they usually adapt to change in a timely manner and bring a deployment scale that reduces cost. For example, Wal-Mart recently announced that it will partner with Dell and eClinical Works to offer low cost EHR's to physicians. The proposed initial cost of this private sector collaboration is reported to be substantially less than most currently available EHR technology. Given the dynamic HIT and HIE landscape, collaborative relationships involving marketplace leaders are necessary to achieve the important goals and social benefits from widespread adoption and interoperability.

Priorities for Advancing HIT

Achieving a critical mass of HIT adoption among providers

One primary need for a successful statewide HIT system in Colorado is increasing the adoption rate of EMRs. According to the U.S. Congressional Budget Office, however, only 12 percent of physicians and 11 percent of hospitals are using an EMR. The business case for interoperability is a bit of a "chicken versus the egg" quandary since increasing adoption

of EMRs and other supporting technologies is difficult without more providers participating and thereby adding more information to share.

The low adoption rate of EMRs among providers is linked to:

- Costs for upfront capital investments, ongoing HIT infrastructure support, and workforce time and training to adopt practice methods for using HIT
- Need for physicians to change work flow procedures by receiving training and incorporating technical functionalities
- Few current economic incentives
- Benefits not well articulated or substantiated
- Limited IT skills among health care professionals

Fostering patient support and participation in HIT

A second primary need that the State must support is increasing patient involvement to drive demand for better health information and improve the quality and value of health care. Patients have been noticeably absent from many HIT discussions. This is a critical oversight since serving patients is the purpose of health care. Their input and participation is necessary to shape and demand change across the continuum of care. Ultimately, it is the patients who pay all medical costs — either directly, through purchased insurance, or as taxpayers. Patients are also in a unique position of being the customer for both payers and providers. As the link between payers and providers, patients can therefore pressure all stakeholders to adopt technology that meets patient needs.

Patients have been noticeably absent from many HIT discussions

Patient involvement is also required to achieve the desired quality improvements in health care. This need is especially true in the treatment of chronic conditions, which has been identified as having the greatest potential for benefitting from HIT. A patient's ability to share health data from home (e.g., glucose or blood pressure readings) with their providers is an important variable in quality care. Moreover, patient data from home will become increasingly valuable as the population ages and more health care is shifted from traditional venues like hospitals to outpatient facilities and home care. It is also worthy to note that this population will have an increasingly higher rate of personal technology adoption.

Administrative Simplification

With at least 36 licensed health insurance companies in Colorado, each offering a number of different benefit plans, the administrative burden on physicians and other providers to seek reimbursement for their health care services can be significant. Administrative simplification, universal credentialing, online eligibility verification, and standardized health ID cards could each substantially reduce administrative burdens. Significant progress toward simplification would be achieved by enabling providers to send an online inquiry or electronically swipe a patient's standardized health insurance card. This would allow providers to immediately know:

- Whether the health plan covers the patient
- Whether the service rendered is a covered benefit, and what is the benefit (copay, coinsurance levels, deductible, per member contract)
- What the patient owes
- The amount a health plan will pay for the authorized service

Colorado Road Map

What should the end state look like and how do we get there? Designing a road map will be vital to the State of Colorado's implementation, adoption and sustainability of statewide HIT.

There are no single, short-term solutions or band-aids for serious HIT development. While well-intentioned and providing nominal advancement of HIT, there have been numerous, fragmented efforts in Colorado that have not necessarily promoted a more comprehensive, longer term solution. A sustainable solution for the State and all stakeholders will maintain flexibility in order to evolve with changing conditions and technology. By establishing a vision for the future of HIT in Colorado, it is possible to create a road map for going forward.

Most objective benefits of HIT will be realized in the longer term. Although considered unproven by some in the industry, the committee believes potential benefits are achievable through a thoughtful, phased approach to balance cost and functionality in implementing various HIT features statewide.

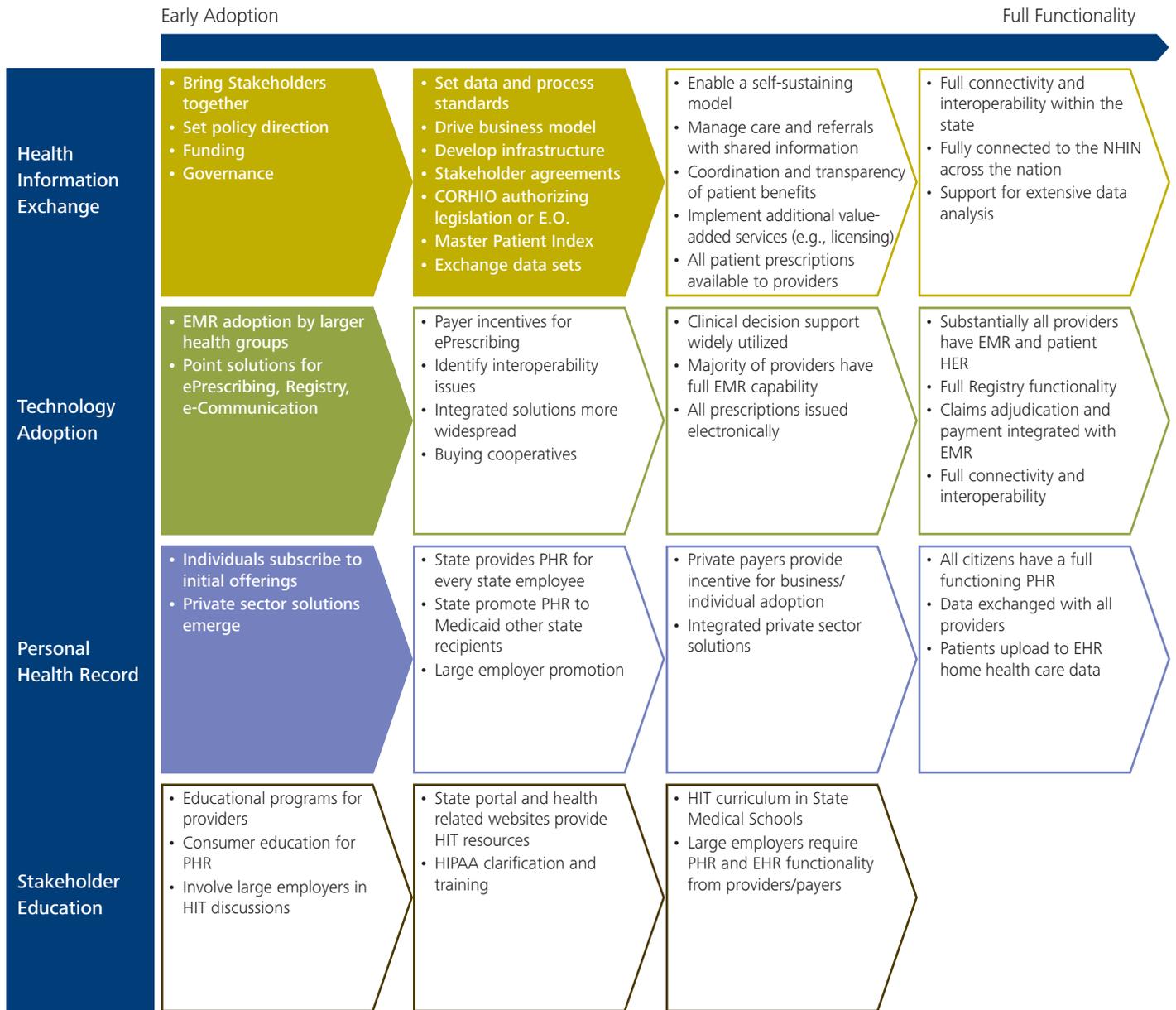
Cost issues, fragmentation, and a need for common leadership has made adoption of electronic health care tools difficult and disorganized in Colorado. Currently, there are hundreds of HIT vendors with various products, many of which are expensive and do not interoperate (communicate) with each other thereby leading to silos, double data entry, and confusion among providers. In order to gain better control over HIT implementation in Colorado, a staged approach is recommended to build toward widespread adoption of a comprehensive interoperable HIT system that includes EMR/EHRs, registry functionality with reporting capabilities, e-prescribing, e-communication, and PHRs.

HIT and HIE should be incorporated as part of Colorado's long range, multi-faceted road map for statewide health care reform. There needs to be a general understanding that HIT is not an end but a means to transforming the State's health care system. It will be impossible to improve health care quality and make it more cost-effective without having an effective health information system established. However, this will be significantly more effective if integrated into a comprehensive plan that includes financial incentives, regional and community approaches, culture change activities, coaching for quality improvement and integration into work flow, and education outlining the value and need for HIT adoption.

The current fragmented system of paper records impedes efficiency, drives up costs, and compromises safety and quality. Health information technologies can enable clinical health information to be digitized and stored where it is created, and shared between multiple data sources and users. Individuals and providers will be able to make timelier and better informed health decisions; and, efficiencies will be created in the delivery of health care services. The cumulative effect of these impacts will result in benefits across the Colorado health care system. A road map is necessary to articulate the vision and strategies for achieving HIE capacity in the context of the State's health care reform goals. This road map should address the multiple components required for an effective health information infrastructure in Colorado, including plans to evaluate the progress and impact of HIE in achieving health care reform milestones for measuring success.

The technology and tools that have been selected by many initiatives within the state are already outdated

**State of Colorado
Health Information Technology Roadmap**



Note: Solid boxes mark current progress

One of the most significant stumbling blocks to robust HIE is the provider's difficulty in purchasing and implementing products, especially with adequate interoperability capacity

The road map must target goals for building effective statewide health information capacity that serves all Coloradans. Build out of an HIE infrastructure requires the fiber pathway and digital capacity necessary to serve providers, patients, and public-private systems. Investments in HIT need to be made for improved health care across the continuum of health care interactions:

- A critical mass of providers needs to shift to electronic record systems.
- An interoperable HIE needs to be in place for systemized and confidential exchange of information.
- Providers require technical capacity to create efficiencies and improved health care decision making.
- Providers and payers need to change incentives and reimbursement systems to reward value and innovation in health care delivery. Widespread recognition of the negative incentives created by the current reimbursement system which rewards volume and does not take into account patient outcomes helps to create a dysfunctional system.

A collaborative public-private leadership and organizational infrastructure is required to coordinate Colorado's road map for implementation and to foster the shared investments necessary to build statewide capacity. Some individual provider groups and health systems are making HIT investments based on their local or proprietary business propositions, and the particular communities and patient populations they serve. Achieving the greatest level of statewide benefit from HIT and HIE requires determining the appropriate scale, in terms of the number of providers with electronic records who are capable of data sharing, to facilitate quality reporting and public health related data exchange. This will require significant capital investments and a sustainable business model that leverages ongoing support for the HIE network from diverse sectors and stakeholders.

Additionally, a credible, neutral governance mechanism is needed to convene stakeholders, facilitate consensus, and coordinate ongoing HIE road map implementation. Successfully implementing HIE across sectors must address incremental stakeholder needs, priorities, and circumstances while aligning with statewide goals for improving health care. Towards this end, models are emerging across states and nationwide recommendations are being promulgated for how states and state-level public-private HIE governance organizations can work to foster implementation of HIT and HIE.

- Forty-nine states have established initiatives and are pursuing road maps to build interoperability. These road maps include plans for governance, technical architecture, HIE services, financing, business models, and policy.
- Consensus is emerging regarding key public-private governance requirements and models that can be effective to coordinate HIE development.
- Recommendations have emerged regarding the important roles for states and state governments.

Colorado's HIT development parallels these emerging models and practices in other states; and, it is congruent with national strategy and recommendations for an interconnected "network of networks."

HIT Adoption by Providers

Statewide strategies and plans for HIT adoption should follow a staged approach, customized to stakeholder needs, that addresses several interrelated factors key to successful integration of new technology into practice. It is important to pace adoption efforts with provider readiness, and to offer support in adopting new tools and

methods. Based on the array of products and functionalities available, costs and time to implement, and other workplace challenges for providers and health systems, HIT adoption strategies need to be carefully designed. In many cases, especially among small physician practices, it has proven most successful for states to stage implementation to begin with electronic systems that are cost effective and easier to implement (such as registries, e-prescribing, and/or e-communication), then advance to working on interoperability between systems and provide incentives where possible for effective electronic capabilities. It is also essential to factor in the need for targeted education of health care professionals and the public about the value of HIT.

Short-Term Strategies and Expectations

Challenges to HIT adoption remain considerable given that the implementation and maintenance costs for providers are significant, both financially and in human capital, while returns on investment are not always clear. Many products do not have functionality required for desired quality improvement purposes or are not as interoperable as anticipated. For the majority of providers, a staged approach may be most effective. This approach will:

- Help build interoperability with other functions
- Provide incentives for adoption
- Enable HIT to be part of a comprehensive plan that includes:
 - Financial incentives
 - Regional or community wide approaches
 - Coaching for quality improvement and integration into work flow
 - Culture change
 - Clinical value
 - Encouragement of patient involvement and adoption of PHRs

Various methods to promote HIT adoption can be undertaken such as collaborative educational campaigns involving government, physician societies, employers, hospitals and others. This will encourage change through education and practice redesign efforts. Structured incentives can involve:

- Connecting smaller practices with larger systems to take advantage of Stark Law — Safe Harbor regulations and extend the law indefinitely
- Encouraging enhanced payment for providers adopting HIT
- Leveraging investments by philanthropy to support IT adoption initiatives
- Offering free or low cost solutions that can become interoperable with other systems such as:
 - EMR from Veterans Administration (VistA)
 - Registries, e-prescribing, e-communication tools
- Leveraging funding from the new federal American Recovery and Reinvestment Act

Long-Term Considerations

As described, there are important reasons why HIT adoption can begin and proceed incrementally with tools that may be short of full, robust EMR systems. However, there are important long-term considerations for ensuring that some consistent level of robust HIE capacity be reached among a critical mass of providers, patients and health care organizations statewide.

Widespread adoption of EMRs and EHRs across Colorado will increase the safety, timeliness, and efficiency of health care delivery. However, as the Governor and legislature seek to set goals and expectations for HIT adoption, and may consider stakeholder education or other strategies, it is important to understand the critical factors that must be addressed to make HIT adoption successful in improving health care. Toward this goal, the State can leverage its influence and set careful expectations for what HIT and HIE can accomplish. Within this practical quality improvement

framework, CORHIO, the HIT industry, quality improvement organizations, and communities of providers and patients, can be called upon to chart a course toward meaningful deployment of HIT technology that serves real time needs, builds valuable long-term capacity, and takes into account the honest evaluation of cost-effective products, capabilities, and implementation supports required. Concurrently, in a parallel effort to encourage the evolution of EMR functionality and interoperability, the State should move forward with the recommendations presented in this report.



¹ Diffusion of Innovations, Everett Rogers, The Free Press, New York, New York, 1995

VII. COMMITTEE RECOMMENDATIONS

Based on its findings and observations, the Health Information Technology Advisory Committee offers the following recommendations for achieving short- and long-term objectives for implementing a statewide HIT system as laid out in the Road Map. Many of the Committee's recommendations closely align with those of the National Governors Association's Alliance on health information reform. The Committee's multi-level recommendations address four broad areas:

- Strategies to promote adoption and incorporation of HIT into the health care delivery system
- Strategies to promote interoperability and HIE
- Executive branch strategies to foster implementation of HIT and HIE
- Private sector engagement and strategies to expand use of HIT

Efforts targeting health care reform must support HIT and HIE interoperability as fundamental building blocks. The ability to monitor and reward quality outcomes requires a critical mass of HIT capacity and data sharing, and the technical capacity to aggregate data as needed from across the Colorado health care landscape. Getting to this level of capacity requires greater capital investments to support HIT adoption and retooling of health care practices. The State can use its leverage to encourage a critical mass of key stakeholders

to adopt HIT and share data through a statewide HIE network. Through a variety of means, the State can also influence the health care marketplace to create: an increased demand for information sharing, incentives for HIT adoption, and participation in HIE through CORHIO. Importantly, policy makers can call for information to monitor and assess the implementation and effectiveness of HIE in improving health care quality and impacting costs.

Additionally, the State Office of Information Technology looks forward to working closely with the legislature to achieve these goals and other objectives for building a sustainable HIT system.

Strategies to Promote Adoption and Incorporation of HIT

Promoting adoption and incorporation of HIT into public and private organizations will require a variety of methods. A few are specifically recommended: promoting the use of e-prescribing, EMRs, and PHRs, plus educating stakeholders on HIT tool benefits and patients on privacy/security protection.

Promote the Use of e-Prescribing

One technology that may show a relatively quick return on investment is e-prescribing. Prescriptions for medications are a prime target for an immediate switch to electronic

communication and there is considerable likelihood that this electronic communication among providers, payers, and pharmacies will increase safety and efficiency. Overall, e-prescribing provides a relatively easy step to increase the HIT adoption rate. Low cost solutions are available to providers, and are usually integrated with other functionalities. Medicare has already provided incentives for e-prescribing starting in 2008. E-prescribing will readily reduce errors, increase efficiency, enable smaller practices to use HIT, and provide significant cost reduction for all stakeholders.

Recommendations for adoption and implementation of e-prescribing by pharmacies, payors and other stakeholders include:

- a. Colorado Regional Health Information Organization (CORHIO) should develop a plan for providing the required functionality for e-prescribing based on stakeholders input (e.g., reseller of ASP services, Rx Hub/Surescript) and making medication history available to support medication reconciliation.
- b. State should evaluate incentives for e-prescribing that may be offered by Medicaid to encourage adoption. These incentives could be similar to those offered by Medicare.
- c. State should evaluate implementing e-prescribing for all State employees and their dependents through its pharmacy benefit managers.
- d. State should consider setting a target date for all prescriptions in Colorado to be transferred electronically from provider to pharmacy.

Health Information Technology Advisory Committee Recommendations

The Health Information Technology Committee recommends numerous actions to enhance safe, timely, efficient, effective, equitable, private and secure patient-centered care:

- Designate CORHIO as the primary HIE governing organization to provide governance, promote health information exchange, and collaborate with other RHIOs.
- Promote the use of electronic prescribing.
- Promote the adoption of clinical data collection and transfer of information among providers.
- Support the use of personal health records and other private sector solutions.
- Increase awareness and educate stakeholders on benefits, tools, patient rights and provider obligations.
- Create a specific HIT resource within the State Office of Information Technology (OIT).
- Encourage private sector adoption through education, incentives and policy.

Promote Adoption of EMRs and EHRs

The adoption of clinical data collection technology and transfer among care providers to enhance safe, timely, efficient, effective, equitable and patient centered care will have wide-spread impacts on all providers and patients. Colorado needs to overcome the low adoption rate of HIT and HIE by increasing the overall network of providers that can interoperate, and encouraging functionality that will support registry and e-communication. Particular recommendations to the State for promoting the adoption of EMRs, EHRs and other supporting technologies include:

- a. Promote educational programs for physicians and clinics to demonstrate the benefits, availability and impact of EMRs.
- b. Request CORHIO to evaluate available EMR product functionality and consider forming buying cooperatives to help facilitate and reduce the cost of EMR technology.
- c. Evaluate investment tax credits or other incentives for the purchase or use of EMR technology by physicians and smaller clinics, including consideration of matching private sector investments.
- d. Set goals and milestones for statewide adoption and HIE implementation.

Support the use of Personal Health Records

Supporting the use of PHRs and other private sector solutions will increase the participation of consumers (patients) in their health care and will have significant long-term benefits. Ultimately, the benefits of HIT and HIE are for the patient; and, PHRs encourage their understanding of these larger systems. Education of consumers is essential in this process. One of the most important PHR benefits is greater patient access to a wide array of important health information, data, and knowledge. Patients can leverage that access to improve their health and manage their diseases.

PHRs are readily available at low cost, not requiring any substantial investment by the State of Colorado. Widespread adoption and

use of PHRs will not occur, however, unless they provide perceptible value to users, are easy to learn, and easy to use. These PHR recommendations and strategies may be adopted immediately:

- a. State should provide a secure, portable PHR for every State employee and their dependents.
- b. Governor should encourage larger employers in the state to provide PHRs for their employees.
- c. State should provide leadership in educating consumers and promoting the availability and benefits of PHRs.
- d. State should use its leverage with Medicaid, S-CHIP and other health care programs to encourage adoption of PHRs for their constituencies.

Increase Awareness and Educate HIT Stakeholders

Increasing awareness and educating all stakeholders on HIT benefits, tools and patient rights and provider obligations for privacy, are requisite initial steps for developing an HIT system. Knowledgeable, active stakeholders offer numerous benefits. The impact of State employees demanding HIT from a large number of providers would create a significant jump in the HIT adoption rate by both employees and providers. A reduction in errors, and duplicate tests could reduce direct medical costs for employers and employees. Employers and employees can become empowered and exercise greater personal responsibility over health care decisions. There are numerous recommendations for working toward these objectives:

- Educate State employees on the benefits of HIT and privacy provisions.
- Include information regarding HIT on appropriate State websites and portals.
- Encourage Medicaid to provide information on the benefits of HIT to providers and patients.
- Request providers to include HIT information and links to State portals and other websites.

- Governor should meet with larger providers to promote participation in HIEs.
- Increase awareness of resources that support incentives for early adopters.
- Leverage Federal and private grants for funding HIT and HIE education.
- Encourage coordinated messaging and activities among state agencies.
- Encourage the University of Colorado's School of Medicine to include EHRs as part of their training within the next two years and include appropriate technology courses as part of their curriculum.

Strategies to Promote Interoperability and HIE

Establishing a primary governing organization for HIT development, such as CORHIO, is a critical and recommended component leading most state initiatives in order to promote systemic interoperability and HIE. The entity should be comprised of a cross-section of HIE interests and include representation from many current initiatives. This inclusive approach will allow a pooling of knowledge that can be used to facilitate the success of investments already put forward by the stakeholders, as well as any future investments. Fostering this knowledge exchange in a RHIO will greatly benefit all initiatives and reduce potential redundancy and duplications of efforts.

CORHIO has already been successfully launched to serve as a non-profit, neutral governance body to convene Colorado stakeholders, ensure transparency, and provide

a structure for public-private collaboration and coordination for ongoing road map implementation. CORHIO's development follows emerging models being implemented by other states. As an independent non-profit entity, CORHIO provides a neutral venue outside of State government that can also serve the State's HIE interests. And, it has been included as part of the Governor's Building Blocks to Health Care Reform.

Designate CORHIO as the Primary HIE Governing Organization

Designating CORHIO as the primary organization to provide governance, promote the exchange of medical information for the State of Colorado, and collaborate with other RHIO's is recommended. A single organization, with support and authority from the State, can provide leadership and bring multiple HIT and HIE initiatives together in order to facilitate statewide development and exchange of medical information.

This entity should promote collaboration but not enforce regulation upon HIE initiatives. Rather, it should categorize, monitor, assist and provide information to these initiatives. CORHIO could provide value to the State by mapping out the various existing or planned HIE efforts and assisting in the coordination of such efforts.

Implementation of the state's road map requires a mechanism to ensure that HIE develops through ongoing coordination of practical, incremental HIT and HIE strategies in order to accommodate diverse stakeholders while also serving the State's health care reform goals. CORHIO is needed to:

- Lead and support collaborative work
- Raise awareness of HIT benefits among all stakeholders
- Develop effective methods for stakeholder input and participation
- Eliminate counter-productive competitiveness among stakeholders, yet encourage friendly competition among alternative approaches
- Create credible processes and transparency
- Provide a low cost structure, and
- Design a sustainable model for HIT and HIE in Colorado.

Additionally, CORHIO should pursue strategies such as:

- Evaluating opportunities to assist physicians and smaller providers by serving as a buying cooperative or offering other assistance with the acquisition and maintenance of EMR and other technology.
- Consider developing a database that evaluates system capabilities for use by providers who are considering investing in an EMR.

Given the availability of private sector solutions, the cost of initial internal development and the need to constantly keep up with evolving technology, the Committee recommends that CORHIO take advantage of marketplace solutions to facilitate adoption and pursue cost-effective strategies to broker or license technology for use among its participating organizations.

Executive Branch Strategies to Foster Implementation

Creating an HIT resource in the Office of Information Technology (OIT) is recommended to work with public and private sector stakeholders regarding the use and adoption of HIT. This resource can improve the coordination of and be an advocate for statewide HIT by coordinating interagency HIT policy and strategies. It can also develop and implement the State HIT road map in conjunction with CORHIO. Furthermore, the need for dedicated leadership and resources to address State-related HIT capacity and leverage participation in a statewide HIE network is recognized and recommended by the State Alliance for eHealth and the State-level HIE Consensus Project.

This OIT resource should be charged with serving as an interface to inter- and intra-State HIE efforts as well as the monitoring and reporting of metrics on projects. These activities will help identify areas of redundancy and aid in the benchmarking of exchange initiatives for the development of reliable metrics. Stakeholders will become more aware of HIT efforts currently underway

through the promotion and sharing of information enabled by the resource.

A general description of this resource's responsibilities includes:

- Identify Colorado initiatives.
- Identify interstate opportunities.
- Create and maintain a directory of stakeholders.
- Assure integration of all State agency activities related to HIT, broadband adoption and other related technology.
- Champion adoption of HIT.
- Work with CORHIO.
- Monitor surrounding state and Federal efforts
- Identify opportunities to leverage efforts and increase interoperability
- Identify Federal or other grants available to the State that could be leveraged; communicate with the Federal government regarding grants that fragment the process and/or are not effective.
- Develop HIT strategies to avoid creating silos and duplicative capacity that is not part of the coordinated statewide road map.
- Evaluate the return on investment for various stakeholder groups to build value proposition for adoption.
- Evaluate the benefits of various HIT components (EMR, registries, e-prescribing, e-communication, personal health records, etc.) and post such information annually on OIT's website.

Private Sector Engagement and Strategies to Expand Use of HIT

The private sector will be a significant driving force in HIT. There are a variety of avenues recommended for the private sector to participate in the development of systems to increase their benefits from HIT and those of all stakeholders in Colorado.

Universal Credentialing

Facilitate registered physicians and other health professionals to enter or update their credentialing information into a single, uniform online application that meets the needs of health plans, hospitals and others.

Each of the following private sector stakeholder group can offer unique actions for support:

Employers and Other Purchasers

- Influence health plans and other providers in the community to adopt HIT through requirements in Requests for Proposals and performance standards.
- Educate employees about the benefits of choosing health care providers that have HIT systems in place.
- Align payment strategies to reward better performing health care provider systems, such as pay for performance programs.
- Provide education to employees about the availability and benefits of PHRs.
- Provide incentives to employees for

adoption of PHRs.

- Require that health plan-sponsored PHRs can be transferred, stored, and updated by enrollees.

Special Populations

- Provide education to special populations, including the underserved and vulnerable, about the availability and benefits of PHRs.

Health Plans

- Encourage the use of PHRs by their subscribers.
- Promote interoperability of their PHR with national standards, so that the PHR can be portable when the consumer leaves that plan.

Physician and Hospitals

- Encourage the use of PHRs by their patients.
- Enable electronic interoperability with PHRs.
- Utilize patient information from PHRs as part of the workflow in the office, clinic or hospital.

Technology Providers

- Continue to meet innovation challenges for current and future health information systems resulting from evolving technology and new reporting and functionality requirements.
- Collaborate in interoperability efforts across vendors, providers and geographies to assure EMR/EHR effectiveness.



POST SCRIPT — AMERICAN RECOVERY AND REINVESTMENT ACT

On February 17, 2009 in Denver, Colorado, President Obama signed into law the American Recovery and Reinvestment Act (“ARRA” and more commonly known as the “Stimulus Bill”). Included as part of ARRA was the Health Information Technology for Economic and Clinical Health (HITECH) Act, which provides significant new funding and other provisions that will have a dramatic impact on HIT adoption, use and interoperability.

The details of the new law are too extensive to fully list and many provisions are still being assessed as to their requirements and potential benefits. The following brief summary points to how timely and important this sweeping legislation will be and how it will help to provide funding and other support for the recommendations of this report.

Medicare/Medicaid Incentives

Over \$30 billion of incentive payments through Medicare and Medicaid for health care providers for the “meaningful use” of Electronic Health Record technology. Funds will be available beginning in 2011. Failure to adopt such use by 2015 will result in reduced reimbursement payments.

ONCHIT Support of National HIT Infrastructure

The office of the National Coordinator for Health Information Technology (ONCHIT) will receive \$2 billion to help implement a nationwide infrastructure. Included are funds for states or “state designated” entities to support regional health information exchanges. Governor Ritter issued as Executive Order to designate CORHIO to receive such funds in Colorado (See Executive Order). Funds are also available by grants to establish HIT Loan Funds. Funds are available for training, dissemination of information to providers, infrastructure and tools for the promotion of telemedicine, promotion of registries and expansion of public health departments’ use of HIT.

HIT Education and Training

Funding to develop curricula integrating certified EHR technology in the clinical education of health professionals. Grants will also be available for institutions of higher education to provide assistance to establish or expand health information education programs.

Privacy and Security of Health Information

The HITECH Act expands the applicability of HIPAA and has significant new requirements and civil money penalties related to the use and security of personal health information. Briefly, the HITECH Act includes provisions that:

- Expands HIPAA security requirement to business associates including HIE’s and RHIO’s
- Establishes security breach notification requirements
- Provides guidance on the minimum necessary disclosures for covered entities privacy policies
- Requires accounting of disclosures of personal health information (PHI) for a three-year period
- Grants access to individuals to their PHI in electronic format
- Limits the disclosure or sale of PHI by covered entities for certain marketing purposes

GOVERNOR'S EXECUTIVE ORDER D 008 09

Executive Order D 008 09: Designating the Colorado Regional Health Information Organization as Colorado's Qualified State-Designated Entity to lead efforts to expand the use of health information across Colorado to meet state and federal goals for improving health and health care.

Pursuant to the authority vested in the Office of the Governor of the State of Colorado, I, Bill Ritter, Jr., Governor of the State of Colorado, hereby issue this Executive Order designating the Colorado Regional Health Information Organization as Colorado's Qualified State-Designated Entity to lead efforts to expand the use of health information across Colorado to meet state and federal goals for improving health and health care.

I. Background and Purpose

Health information technology provides tools that can improve the quality, safety, and value of health care services. There is a vital need to promote electronic health data exchange amongst payers, health care providers, consumers of health care, researchers, and government agencies. The State is a major purchaser of health care as an employer and through Medicaid, the Child Health Insurance Program, the Colorado Public Employees Retirement Administration, and, therefore, has a central role to play in improving the quality, transparency, and accountability of health care. However, the full benefit of health information technology cannot be realized until electronic health record systems that support the exchange of health information are in place and used by health care providers, payers, and consumers throughout the state, and across state boundaries. This will ensure that clinical information is available where and when needed to promote health and deliver cost-effective health care services.

The American Recovery and Reinvestment Act of 2009 ("ARRA") included within it the Health Information Technology for Economic and Clinical Health ("HITECH") Act. The HITECH Act provides an unprecedented opportunity to develop and implement the health information technology infrastructure needed to modernize and improve America's health care system. It includes provisions to encourage – and in many instances require – the adoption and meaningful use of health information technology and promote quality, safety, and efficiency of health care services.

The HITECH Act authorizes approximately \$36 billion over six years for health information technology. The goal of the legislation is to ensure that each person in the United States has an electronic health record by 2014. To that end, section 3013 of the HITECH Act directs the National Coordinator of the Office of the National Coordinator for Health Information Technology to establish a program, known as the ONCHIT Program, which will facilitate and expand the movement and use of electronic health information in accord with nationally recognized standards. The ONCHIT Program provides for the awarding of grants to states or qualified state-designated entities.

Approximately \$34 billion is expected to be distributed directly to qualified health care providers who adopt and use electronic health records (EHRs) in accordance with provision of the HITECH Act. These funds will be distributed to health care providers as incentive payments through Medicaid and Medicare between 2011 and 2016. An additional \$2 billion is expected to be made available for health information infrastructure through the United State Secretary of Health and Human Services in the form of grants, loans, and demonstration projects in areas including, but not limited to:

- Regional, state and multi-state infrastructure
- Implementation assistance
- State grants for HIT promotion generally
- Health Information Exchange (HIE) projects
- Loan programs for adoption of certified EHRs
- Demonstration projects for integrating HIT into clinical education
- Health informatics education programs

The Secretary of Health and Human Services and the Office of National Coordinator (“ONC”) have substantial responsibility for setting the strategy for distribution of these funds. The HITECH Act explicitly authorizes federal funds to be used for HIE projects through a state-designated entity and the state will have an opportunity to submit a state plan for achieving meaningful health information exchange. Despite the different pathways for funds that can come to Colorado and its providers, it is in the State’s best interest that the state plan reflects a coordinated approach for using these funds for shared goals.

Colorado is well positioned in the area of health information technology. In addition to the significant HIT efforts underway in communities and among providers across the state, the Colorado Regional Health Information Organization (“CORHIO”) is well established as a statewide public/private non-profit organization dedicated to the promotion of health information exchange. CORHIO serves as the statewide convener of stakeholders to develop solutions and coordinate implementation of statewide information sharing, to link regional HIE projects and meet statewide HIT adoption and information sharing needs. CORHIO reflects stakeholder perspectives from across sectors and interests throughout the state. The CORHIO board is comprised of consumers, providers, health plans, government agencies, and experts in health care quality, value, and information technology. In December 2008, CORHIO launched a secure health data exchange between Denver Health and Hospital Authority, Kaiser Permanente of Colorado, University of Colorado Hospital and The Children’s Hospital, making it among the first group of operational statewide HIE projects in the country. Thus, CORHIO is ideally suited to serve as Colorado’s designated entity responsible for coordinating Colorado’s health information technology initiatives, and to participate in programs and coordinate opportunities that will be made available under the HITECH Act.

II. Directives

- A. CORHIO shall provide leadership and coordination of health information technology related efforts across Colorado to improve health care quality and value.
- B. CORHIO is hereby designated as Colorado’s Qualified State-Designated Entity to participate in the ONCHIT Program and those promulgated by other national agencies and to be responsible for furthering the State’s HIT Initiatives by coordinating, facilitating, and helping to implement multifaceted efforts to advance HIT adoption and health information exchange across Colorado.
- C. Agencies under my direct executive authority shall cooperate in the implementation of this Order. Other entities of State government not under my direct executive authority are requested to assist in CORHIO’s efforts to advance the State’s HIT Initiative.

III. Duration

This Executive Order shall remain in force until modified or rescinded by future Executive Order of the Governor.

GIVEN under my hand and the Executive Seal of the State of Colorado this third day of April, 2009.

Bill Ritter, Jr.
Governor

	Governance		Technical Operations
Function	Convening	Coordinating	Operating
Tasks	<p>Organizational leadership and structure</p> <ul style="list-style-type: none"> • Provide a neutral venue for stakeholder participation • Facilitate engagement by diverse public- and private-sector stakeholders • Support board, committee, and other participation structures and processes • Manage business operations for the state-level HIE legal entity/ organization/enterprise <p>Information and resources</p> <ul style="list-style-type: none"> • Monitor nationwide HIE development and assess implications for local/state efforts • Maintain information about local HIE efforts • Inform national, state, and local stakeholders and HIE efforts • Facilitate consumer input and help communicate with the public <p>Advocacy</p> <ul style="list-style-type: none"> • Advocate for health information technology and HIE adoption to meet health care goals: quality, value, transformation 	<p>Facilitate statewide HIE implementation</p> <ul style="list-style-type: none"> • Identify statewide barriers to HIE and mitigation strategies/plans • Lead development and implementation of specific plans for HIE implementation • Identify and remedy gaps in HIE services <p>Facilitate state alignment with interstate, regional, and national HIE strategies</p> <ul style="list-style-type: none"> • Lead/participate in collaborative HIE development initiatives <p>Promote consistency and effectiveness of statewide HIE policies and practices</p> <ul style="list-style-type: none"> • Facilitate adoption of standards applying to statewide HIE efforts • Develop consensus for organizational HIE policies and practices consistent with state and federal standards/laws • Monitor and enforce HIE policies as appropriate <p>Contribute HIE perspectives and expertise to ongoing health care reform efforts</p> <ul style="list-style-type: none"> • Foster collaborative approaches between public and private sectors to harmonize health care quality improvement <p>Facilitate collaborative development of public policy options to advance HIE</p> <ul style="list-style-type: none"> • Inform agencies/policy makers/ stakeholders regarding needs and opportunities • Provide analysis regarding implications of policy options under consideration 	<p>Owning or contracting for the hardware, software, and technical capacity to facilitate health data exchange</p> <ul style="list-style-type: none"> • Technologically link local HIE efforts together • Provide technology services and assistance to areas not served by local HIE efforts • Serve as central hub for statewide or national data sources and shared services • Provide administrative support and serve as a technical resource to local HIE efforts and state-level HIE participants

Source: State-level HIE Roles in Ensuring Governance and Advancing Interoperability, March 2008, State-level HIE Consensus Project

APPENDIX B

FURTHER RESOURCES

Internet Resources

Agency for Health Research and Quality (AHRQ). U.S. Dept. of Health and Human Services. <http://www.ahrq.gov>

Bureau of Primary Health Care. United States. Department of Health and Human Services. Health Resources and Services. <http://bphc.hrsa.gov>

California HealthCare Foundation

Center on Budget and Policy Priorities. <http://www.chpp.org>

Colorado Association of Family Medicine Residencies. <http://www.cofammedresidencies.org>

Colorado Association of School-Based Clinics. <http://www.casbhc.org/>

Colorado Community Health Network. www.cchn.org

Colorado Department of Public Health and Environment. <http://www.cdphe.state.co.us/>

Colorado Regional Health Information Organization. www.corhio.org

Colorado Rural Health Center. <http://www.coruralhealth.org>

Community Clinics Initiative. <http://www.communityclinics.org>

Community Health Center Network. <http://www.chcn-eb.org>

Health Affairs: The Policy Journal of the Health Sphere. <http://www.healthaffairs.org>

Health Information Technology. United States. Department of Health and Human Services. <http://www.hhs.gov/healthit>

Institute of Medicine of the National Academies. <http://www.iom.edu>

Institute for Urban Family Health. <http://www.institute2000.org>

National Association of Community Health Centers. <http://www.nachc.org>

National Conference of State Legislatures (NCSL)

State Alliance for eHealth. www.nga.org/center/ehealth

State-level HIE Consensus Project. www.slhie.org

U.S. Department of Health and Human Services. www.hhs.gov

Further Reading

Commonwealth Fund Report: "Bending the Curve: Options for Achieving Savings and Improving Value in U.S. Health Spending"

"Costs and Benefits of Health Information Technology." Agency for Healthcare Research and Quality; April 2006

"e-Health and America's Broadband Networks." U.S. Internet Industry Association; August 2007; www.usdoj.gov/atr/public/workshops/telecom2007/submissions/227762.htm

"Electronic Health Records in Ambulatory Care: A National Survey of Physicians." DesRoches CM, et al. *New England Journal of Medicine*; July 3, 2008

"Electronic Health Records Overview." National Institutes of Health; April 2006; www.ncrr.nih.gov/publications/informatics/EHR.pdf

"Evidence on the Costs and Benefits of Health Information Technology." Congressional Budget Office; May 18, 2008

"Gauging the Progress of the National Health Information Technology Initiative." California HealthCare Foundation; January 2008; www.chcf.org/topics/view.cfm?itemID=133553

"Harnessing Technology to Improve Medicaid and SCHIP Enrollment and Retention Practices." The Kaiser Commission on Medicaid and the Uninsured; May 2007; www.kff.org/medicaid/7647.cfm

"Health Information Technology Adoption Among Health Centers: A Digital Divide in the Making?" National Health Policy Forum; July 23, 2007; www.nhpf.org/pdfs_bp/BP_HealthCenterIT_07-23-07.pdf

"Health Information Technology: Can HIT Lower Costs and Improve Quality?" Rand Corporation; 2003; www.rand.org/pubs/research_briefs/2005/RAND_RB9136.pdf

"Health Information Technology for Improving Quality of Care in Primary Care Settings." Agency for Healthcare Research and Quality, Institute for Healthcare Improvement; July 2007

"Health Information Technology in the United States: The Information Base for Progress." Robert Wood Johnson Foundation; 2006; www.rwjf.org/files/publications/other/EHRExecSummary0609.pdf

"Health Information Technology Legislative Tracking Database." National Conference of State Legislatures; www.ncsl.org/programs/health/forum/Hitch/HIT_database.cfm

"Overcoming Barriers to Electronic Health Record Adoption." Healthcare Financial Management Association; February 2006; www.hhs.gov/healthit/ahic/materials/meeting03/ehr/HFMA_OvercomingBarriers.pdf

"State-level Health Information Exchange: Roles in Ensuring governance and Advancing Interoperability." March 10, 2008, report from the State-level HIE Consensus Project, Foundation of Research and Education, under contract to ONC

The National Alliance for Health Information Technology, Report to the Office of the National Coordinator for Health Information Technology on Defining Key Health Information Technology Terms; April 28, 2008



