



The Colorado Health Foundation™



REPORT

Health Information Technology in Colorado

October 2008



Overview

The proliferation of information technology has touched almost every aspect of daily life. IT lets customers do their banking anywhere in the world. Passengers print out their boarding pass before arriving at the airport. Shopping can be done anywhere there is an Internet connection. The only place IT adoption has lagged behind is where it is needed most—our doctor's office. When it comes to our health care, we still rely on paper records.

Despite spending more than \$1.7 trillion on health care every year, Americans are not getting what they pay for. The Institute of Medicine estimates that preventable medical errors are responsible for 45,000 to 98,000 deaths each year, making them more deadly than motor vehicle accidents, breast cancer or AIDS.¹ Services are fragmented. Providers cannot easily share information. Patients are sent for unnecessary repeated testing and physicians unknowingly prescribe drugs that interfere with other drugs.

Experts agree that health information technology (HIT) has the potential to remedy much of what ails our health care system. "The use of electronic health records, and of health information technology as a whole, has the ability to transform the way health care is delivered across our nation," Health and Human Services Secretary Michael Leavitt said recently.² The U.S. Department of HHS articulates the following vision for HIT³:

"Health information technology allows for comprehensive management of medical information and its secure exchange between health care consumers and providers. Broad use of HIT will:

- Improve health care quality
- Prevent medical errors
- Reduce health care costs
- Increase administrative efficiencies
- Decrease paperwork
- Expand access to affordable care."

HIT can make the following possible:

- Coordinate care between multiple providers
- Shorten wait times for patients
- Lower physicians' operating costs
- Reduce administrative paperwork
- Warn physicians about drug interactions
- Send prescriptions electronically from doctor to pharmacist
- Alert physicians and patients about the need for screening tests
- Give physicians instant access to treatment guidelines
- Automatically schedule appointments and follow-up visits
- Order and document tests, preventing duplication
- Detect infectious disease outbreaks early and prevent new infections.³

Inspired by this potential, President Bush created a National Coordinator for Health Information Technology in 2004, along with a 10-year plan for using HIT to modernize the U.S. health care system. At that time, it was predicted that every American would have an electronic health record (EHR) within 10



years. Since then, the Agency for Healthcare Research and Quality (AHRQ) has invested more than \$260 million in HIT projects across the nation. The Colorado Health Foundation has also made HIT a strategic priority to fulfill its vision, investing \$8.5 million in its first initiative, *Healthy Connections*.

HIT and The Colorado Health Foundation

HIT is integral to the Foundation's vision to make Colorado the healthiest state in the nation and its ability to achieve its three goals: improved **Health Care**, access to the components of **Healthy Living**, and expanded **Health Coverage** (Table 1).

Health Care

HIT is central to achieving our health care goal of all Coloradans having access to coordinated, quality health care. Without electronic medical information that can be shared easily between providers and care settings, care cannot be coordinated effectively. Similarly, health care quality cannot be improved if data cannot be captured, measured and acted upon in a systematic, repeatable way. HIT can also make care delivery more efficient, easing our shortage of health care professionals.

Healthy Living

The use of HIT, including EHRs, Disease Registries, and Personal Health Records, can enable better communication and coordination between patients and their doctors. HIT can enable patients to become more engaged and in control of their care, allowing them to better manage their health and chronic conditions. For example, HIT permits better documentation and treatment of obesity.⁴ For patients who are already obese, HIT facilitates the integration of treatments from multiple providers (physicians, nutritionists, behavioral health providers). Information technology tools also allow obese patients to self-monitor their diet and physical activity, which studies have shown increases awareness of one's behavior and enhances the likelihood of weight loss.⁵

Health Coverage

HIT such as Practice Management Systems enable safety-net clinic staff to track demographic and socioeconomic information about their patients that helps determine their eligibility for and enrollment status in Medicaid and Child Health Plan *Plus* (CHP+). HIT can also automate the application and renewal processes and coordinate the efforts of different agencies—of particular importance to families who are covered by both Medicaid and CHP+.

Because of this immense potential, the Foundation has joined federal and state governments working to promote the adoption of HIT.



Table 1: Examples of Foundation HIT Investments by Goal Area

HIT Grantee	Goal Area	Grantee Accomplishments
North Colorado Health Alliance	Health Care	<ul style="list-style-type: none"> • Shares EHR system with principal safety-net provider in area, giving patients treated at either facility a single record and preventing duplicative services • Shares EHR system with mental health and substance abuse treatment centers
High Plains Community Health Center	Healthy Living	<ul style="list-style-type: none"> • Has a chronic disease management program for patients with diabetes and cardiovascular disease • Uses EHRs to ensure evidence-based treatment plans are followed and to send reminders when patients are due for tests or services
Marillac Clinic	Health Coverage	<ul style="list-style-type: none"> • Participates in a health information exchange network • Plans to integrate patient data into Medicaid database to provide real-time eligibility information to local providers

What is needed in Colorado to move forward with HIT adoption is strong leadership from government, health care and philanthropic sectors. To achieve this goal, staff will:

- Bring together all stakeholders to achieve a statewide vision and blueprint for health information exchange (HIE)
- Encourage the development and implementation of technologies that streamline health care delivery, increase access to care and reduce the likelihood of medical errors
- Address barriers to telehealth and HIT utilization and expansion, including payment, infrastructure, training and workforce capacity
- Seek enhanced reimbursement for safety-net clinics that use HIT and for the ongoing costs of HIT.

Progress in Electronic Health Records

An essential component of HIT is the EHR, the digital version of the paper medical record that details a patient’s medical history, including diagnosed medical conditions, vital signs, immunizations, prescribed medications and lab results. In addition to enhancing the quality and coordination of health care, EHRs offer administrative benefits. Computerized scheduling, resource management and billing increases efficiency. Quality outcome reporting, which is required of Federally Qualified Health Centers, is an automated function of some of these systems.

However, physicians in the United States have been slow to adopt EHRs. Cost is the biggest barrier, with startup costs averaging \$44,000 per provider and another \$8,500 required for annual maintenance.⁶ But EHRs offer considerable long-term savings. According to the journal *Health Affairs*, an interoperable, standardized EHR system could save the United States \$78 billion per year, or about 5 percent of the \$1.7 trillion spent on health care annually.⁷

“Standardized” and “interoperable” are essential ingredients, according to the journal’s study. Interoperability refers to the ability of HIT systems to communicate with each other. But before interoperability is possible, EHR software must first be standardized so that all computer systems, no matter the operating system, can share data.

In 2007, a single standardized patient record was created, written in an established computer language to ensure interoperability among participating computer systems. Called the Continuity of Care Document, it is a summary of pertinent data on a patient’s health status (problems, medications, allergies, etc.), along with information about insurance, advance directives and treatment recommendations.

Although EHRs are quickly evolving and improving, the current versions have a number of issues that impede clinics’ and providers’ ability to improve care:

- Weak population/disease management capabilities that would allow clinicians to manage the care of a group of patients
- Poor reporting and querying capabilities
- Data interoperability.

Health Information Exchange: Mobilizing Health Data

While standardization allows interoperability, neither is of much use if the data cannot be exchanged between providers, referred to as HIE. Sharing data among providers requires a network—the infrastructure that allows the dissemination of information electronically. The concept of HIE is not that different from the ATM, which you can use to get cash almost anywhere in the United States, if not the world, whether you have an account at a particular bank or not. With a nationwide HIE in place, a physician in North Carolina could access the medical record of New Yorker who gets sick when visiting his sister in Durham.

HIE is particularly important in the safety net, where patients often go on and off insurance and receive care from multiple providers within a single year. If every safety-net provider was connected to an HIE, health care workers at one clinic could have access to the medical record of a patient who had been previously treated at a different clinic.

In October 2004, AHRQ provided grants to a handful of states, including Colorado, to create a national HIE by first forming regional HIEs (Table 2), including one in Colorado. The goal of the Colorado Regional Health Information Organization (CORHIO) Initiative is to build an HIE network that allows providers anywhere in the state to safely and securely look up medical information for any patient.



Table 2: *Examples of HIEs*

State/RHIO	Participants	Comments
Indiana Health Information Exchange	39 hospitals, more than 7,000 providers and 2,500 practices	Has delivered more than 30 million test results since 2004
Ohio HealthBridge	29 hospitals, more than 4,400 physicians, 17 health departments and dozens of physicians' offices and clinics in the greater Cincinnati area	Delivers more than 2.4 million test results each month
Tennessee MidSouth eHealth Alliance	9 hospitals, 15 clinics, and the University of Tennessee Medical Group	Has generated 2.1 million patient records; HIE transmits 33,000 patient records and 800,000 lab results per day; has saved area emergency departments about \$500,000 per year
Utah Health Information Network	100 percent of Utah's hospitals, laboratories, health departments and mental health centers; 90 percent of Utah physicians and safety-net providers	Members pay \$35,000 to connect to the statewide HIE

The initial AHRQ funding—totaling \$5 million over five years—was contingent on CORHIO securing independent funding. The Foundation became one of the earliest independent supporters, granting CORHIO \$100,000 in 2005. Over the years, CORHIO has also received funding from Kaiser Permanente and the Robert Wood Johnson Foundation, as well as from federal and state governments. Colorado Governor Bill Ritter singled out CORHIO as a budget priority in the “Building Blocks for Health Care Reform” plan he released earlier this year. The Foundation has also continued to support CORHIO, granting \$1.4 million in 2008 for its efforts to:

- Integrate and improve the quality of health care services
- Share clinical data within the safety net
- Make shared clinical data more secure
- Reduce duplicative tests and procedures.

The Foundation’s *Healthy Connections* initiative grants have positioned safety-net clinics to connect to the state’s HIE.

Personal Health Records

Broader than an EHR, the Personal Health Record (PHR) is used to collect, track and share important, up-to-date information about an individual's health. Although PHRs should be integrated with the EHRs of providers, the PHR is separate from and does not usually replace the legal medical record of the provider. Information in the PHR should be understandable to the individual and the entire record should be under his or her control.

The PHR empowers people to manage their health care and helps them make better health decisions. Quality of care improves because individuals can access and use information needed to communicate effectively with providers about their health care. The PHR should contain all information relevant to the person's needs, which at a minimum includes:

- Personal identification, including name and birth date
- Emergency contacts
- Names, addresses and phone numbers of the individual's physicians, dentists and specialists
- Health insurance provider
- Living will, advance directive or medical power of attorney
- Organ donor authorization
- Dates of significant illnesses and surgical procedures
- Current medications and dosages
- Immunizations and their dates
- Allergies or sensitivities to drugs or materials such as latex
- Important events, dates and hereditary conditions in the family history
- Recent physical examination results
- Specialists' opinions
- Important test results, including vision and dental records
- Copies of correspondence with providers
- Current educational materials—or appropriate Web links—relating to the individual's health.⁸

People can create their own PHR or use one offered by their health care provider, insurer, employer or commercial supplier. Currently, there are nearly 40 companies offering Internet-based PHRs. Microsoft's recently unveiled "HealthVault" has already been endorsed by several leading health care organizations, including Kaiser Permanente, the nation's largest nonprofit health maintenance organization. Google, the preeminent Internet search engine, also has a Web-based PHR.



Wiring Rural Colorado

Of Colorado's 64 counties, 47 are rural. The population in these areas has increased by more than 40 percent since 1990.⁹ Rural residents tend to be older, more economically disadvantaged and more likely to be uninsured. Their access to care is more limited: 14 rural counties have no hospital and seven counties have no dentist. In addition, rural areas face chronic shortages of health care providers and the current health care workforce is aging. These communities could benefit tremendously from being able to share patient medical information and consult and coordinate care with providers in metropolitan areas.

Unfortunately, their ability to accomplish this is hindered by a lack of bandwidth in rural communities, where broadband may be either unavailable or prohibitively expensive. To address this issue, the Federal Communications Commission (FCC) started its Rural Health Care Pilot Program, backed by \$417 million in funding in 2007. The Colorado Telehealth Network (CTN) initiative was awarded \$4.6 million over three years to create a broadband network that would connect rural Colorado hospitals and health clinics within two years.

To support this effort, the Foundation granted \$150,000 in March 2008 to help CTN hire a full-time project director to oversee efforts to secure the FCC grant and achieve three main goals:

- Bring long-distance health care to rural residents via the Internet
- Optimize and expand HIT capabilities in rural areas (including Telemedicine)
- Coordinate care during a public health emergency.

When combined with a second FCC grant to the Colorado Behavioral Healthcare Council, CTN now has almost \$10 million in funding. As of August 2008, 72 Colorado hospitals, 118 health clinics and 184 mental health centers agreed to participate in the statewide broadband network, making this the largest such program in the nation. "For too long, rural communities have struggled to secure and retain providers and receive the kind of health care they deserve," Gov. Ritter said. "This is such an important step towards helping rural patients secure quality health care when and where they need it."¹⁰

Gov. Ritter also took steps at the state level, creating the Colorado Rural Health Care Grant Council in 2007 with a \$7.5 million donation from United Healthcare.* In 2008, the Council awarded more than \$800,000 for HIT projects. One HIT grant went to West Regional Mental Health, an organization the Foundation has also supported, with \$148,000 in funding in 2007 for a telepsychiatry network that would allow rural residents to receive mental health services over the Internet.

* Gov. Ritter appointed The Colorado Health Foundation Senior Program Officer, Khanh Nguyen to the Colorado Rural Health Care Grant Council.



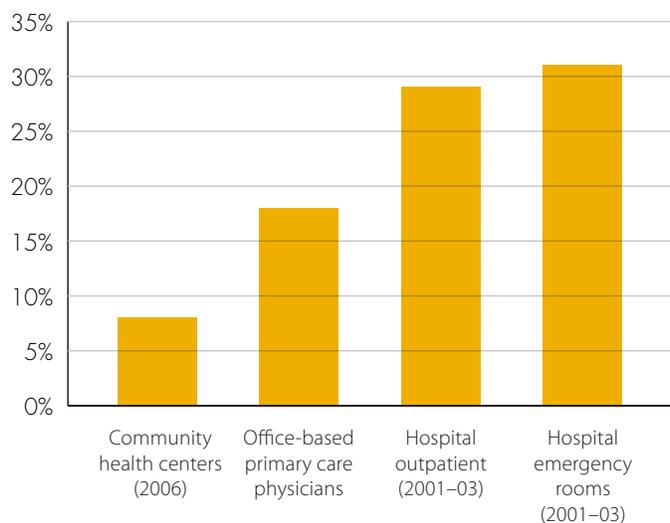
Bringing HIT to the Safety Net

Safety-net providers are the sole source of health care for one in 10 people in Colorado. The number of Coloradans relying on the safety net is expected to rise as the economy suffers and the cost of insurance premiums rise for both workers and employers.

Safety-net providers have unique HIT needs. Patients are usually poorer, sicker, more prone to chronic disease and more geographically or socially isolated. Providers typically offer an array of services, such as dental care and mental health care. They must also coordinate and/or provide supportive services—transportation, patient education and outreach, translation services—and collect, analyze and report outcomes and quality data to qualify for federal funding. These specialized needs require functionality that has not typically been standard in HIT applications such as EHRs.

The safety net has made some progress toward making the switch to EHRs in recent years, although these clinics still lag far behind hospitals and private practitioners (Figure 1). Part of the problem is that many clinics lack even the basic hardware and software needed to use advanced HIT tools. They work with donated computers loaded with outdated software and have limited, unreliable Internet access. The higher start-up costs, along with the high-cost customized software, would be hard to manage with an already stretched budget. In addition, these clinics typically don't have the IT staff and resources to manage the planning, implementation and ongoing maintenance required of HIT applications.

Figure 1: EHR Adoption Among Health Care Providers



Source: National Association of Community Health Centers. "Electronic Health Information among Community Health Centers: Adoption and Barriers." May 2006; www.phsi.harvard.edu/quality/clinical_it_safety_net/CHC_HIT_survey_fact_sheet.pdf.



The *Healthy Connections* Initiative

To help overcome some of these barriers, the Foundation created its first HIT initiative—*Healthy Connections*—in 2007. The goal of *Healthy Connections* is to enable safety-net clinics to:

- Successfully plan implement, and utilize HIT
- Better coordinate health care services (e.g., physical, mental and oral health) for underserved Coloradans
- Improve the quality of care they provide.

In its first year, *Healthy Connections* awarded \$2.5 million to 21 nonprofits, some that were just beginning to consider HIT and others that wanted to expand their existing HIT capabilities. Table 3 describes the experience of some of these grantees.

Phase 2 of *Healthy Connections*, launched in August 2008 with the release of a second Request for Proposals, will build on Phase 1. It will award an additional \$6 million for HIT projects, this time with a focus on rural safety-net providers and nascent efforts to build HIEs in communities around the state.



Table 3: Phase 1 Healthy Connections Grantee Accomplishments

Organization	Reason for Applying for Grant	Outcomes*
Clinica Campesina: Provides primary care to underserved residents of south Boulder, Broomfield and western Adams counties	Existing practice management system was obsolete; believed EHRs would improve quality of patient care	Quality of care greatly improved; instead of using multiple spreadsheets to record patient data, the patient data process is now automated; created multiple Disease Registries; HIT is helping attract new physicians
Doctors Care: More than 529 participating physicians provide a medical home for 4,300 children and adults in south metro Denver	Existing practice management system was outdated; needed to evaluate HIT needs	IT staff is now in place; has a three-year hardware refreshment plan to accommodate new software purchases
Fort Collins Family Medicine Residency Program/Family Medicine Center: Provides care to 12,000 underserved patients in the Fort Collins area	The Family Medicine Center has had an EHR system since 2005, but it was under-utilized due to lack of training	Training did not significantly interfere with the workflow; 100 percent of physicians 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	Had a productive HIT system in place but needed funding to hire an HIT coordinator to optimize its use	Now 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: Federally Qualified Health Center (FQHC) that serves 8,700 people in the Glenwood Springs area	Used paper for data collection; as an FQHC, it knew EHRs would be required in the future	Has fully operational EHR and is well on way to developing reports for decision making; has been a model for smaller clinics in the area
Pueblo Community Health Center: Provides range of services to 18,300 patients at five clinics in the Pueblo area	Had multiple EHR and practice management systems, leading to redundancy and errors	HIT systems are now optimized; staff can 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 were not compatible with main practice management system; needed to adopt and sustain an efficient HIT system	Staff at all 18 clinics have received basic computer training; electronic schedules can be accessed from any clinic site; system is now providing data for reporting

* Outcomes are based on interviews conducted in June 2008.

Other HIT Projects in Colorado

The Foundation has supported other efforts to bring HIT to the safety net (Table 4), including the Colorado Associated Community Health Information Exchange (CACHIE). CACHIE is promoting the use of information technology at the states' 15 Federally Qualified Health Centers (FQHCs). These centers provide preventive, primary and other health services to nearly 400,000 primarily low-income, uninsured Coloradans each year. In 2007, the Foundation granted \$194,000 to help CACHIE develop and build a data warehouse for gathering, analyzing and reporting the data needed for the FQHCs to qualify for federal funding.

Table 4: Colorado's HIT Efforts at a Glance*

Program	Goal
Colorado Associated Community Health Information Exchange (CACHIE)	Promote the use of HIT to support quality reporting and improvement in the safety net
Colorado Regional Health Information Organization (CORHIO)	Develop a statewide HIE network that will eventually be part of a nationwide network
Colorado Telehealth Network	Create a statewide fiber optic broadband network for sharing clinical data and enabling Telemedicine
<i>Healthy Connections</i> Initiative	Support the use of HIT among safety-net providers to improve access to high-quality, coordinated care
Quality Health Network (QHN)	Create a regional HIE network in Western Colorado

*See also Appendix D.

Foundations' HIT Investments

HIT programs in many states have received funding from foundations and from the state and federal government (Table 5). In 1999, The California Endowment and the Tides Foundation created The Community Clinics Initiative, which awarded more than \$60 million to California safety-net clinics for HIT connectivity, hardware, and administrative and EHR software.¹¹ In 2008, a quality improvement initiative was created by five California health care philanthropies: the California HealthCare Foundation, The California Endowment, Kaiser Permanente, Blue Shield of California Foundation, and the Community Clinics Initiative/Tides. Called "Tools for Quality," the program has granted 33 community clinics up to \$400,000 each to buy Disease Registry software and receive training in its use.¹²

In New York, The Commonwealth Fund has granted a total of \$1.3 million for a variety of HIT projects, including the development of an automated school health record that will help enroll eligible children in public health programs. In 2002, The Robert Wood Johnson Foundation awarded \$500,000 to a project that is evaluating the use of Telehealth services to improve the health care of low-income inner-city children in Rochester, NY.¹³ The state of New York has also committed \$100 million for the development of a statewide HIE.

Table 5: Examples of State HIT Projects and Their Funders

State	Name	Description	Funder	Amount	Details
California	The Community Clinics Initiative (CCI)	Supported HIT connectivity, hardware, and administrative and EHR software for safety-net clinics.	The California Endowment and the Tides Foundation	\$60,000,000	Began in 1999
	Tools for Quality	Provides funds to improve quality through the purchase of Disease Registry software and training in its use.	The California HealthCare Foundation, The California Endowment, Kaiser Permanente, Blue Shield of California Foundation and the Community Clinics Initiative/Tides	\$13,200,000	\$40,000 to 33 clinics in 2008
Indiana	Indiana Health Information Exchange	An HIE with 39 hospitals, 7,000 providers and 2,500 participating practices with the goal of improving the quality, safety and efficiency of health care; creating unparalleled research capabilities; and developing a successful model of HIE for the rest of the country. Has delivered more than 30 million test results since 2004.	Connecting Communities for Better Health (CCBH) initiative of the Foundation for eHealth Initiative (eHI), the Human Resources and Services Administration and BioCrossroads, an organization providing capital and support to Indiana's life sciences industry.	\$11,300,000	
New York	Various projects	Provides funding for a variety of HIT projects, including the development of an automated school health record that will help enroll eligible children in public health programs.	The Commonwealth Fund	\$1,300,000	
	Health Information Exchange	Promotes HIT through community collaborations to improve health care quality, affordability and patient outcomes. Funds 19 projects around the state.	The State of NY	\$105,750,000	2008
Utah	Utah Health Information Network	A coalition of health care providers, payers and other interested parties working to standardize health data and initiate electronic commerce. The goal is to provide the health care consumer with reduced costs, improve health care quality and access, and facilitate research.	Agency for Healthcare Research and Quality (AHRQ)	\$5,660,000	



Federally Funded HIT Programs

The federal government has continued to support the HIT effort launched in 2004. In 2008, the administration announced two new projects: a \$150-million program that will provide bonuses to Medicare doctors who use EHRs, and a personal health record pilot program for Medicare beneficiaries. Over the years, the federal government has invested hundreds of millions of dollars in a variety of HIT projects (Table 6).

Table 6: Federal HIT Efforts

Agency/Organization	Initiative description
Agency for Healthcare Research and Quality (AHRQ) www.healthit.ahrq.gov	Advocates for HIT adoption, specifically to improve patient safety. Funds provider/clinic efforts nationally, including numerous initiatives in Colorado.
Centers for Medicaid & Medicare Services (CMS) www.cms.hhs.gov	Aims to reward the delivery of high-quality care supported by the adoption and use of electronic health records in physician practices.
Certification Commission for Health Information Technology (CCHIT) www.cchit.org	Contracted by the federal government to develop and evaluate certification criteria and create an inspection process for HIT.
Federal Communication Commission (FCC) www.fcc.gov	Provides rural health care providers with the infrastructure for broadband Internet access and reduced rates for telecommunications services and Internet access for the provision of health care.
Health Resources and Services Administration (HRSA) www.hrsa.gov/healthit	Promotes the widespread availability and use of digital networks to improve access to health care services for people who are uninsured, isolated or medically vulnerable. Provides technical assistance to Federally Qualified Health Centers and health center controlled networks.
Institute of Medicine (IOM) www.iom.edu	IOM reports underscore the importance of a dramatically improved IT infrastructure to support a 21st century health system. Building blocks for such a system include electronic health records and national standards.
Office of the National Coordinator for HIT (ONC) www.dhhs.gov/healthit/onc/mission/	Provides federal leadership for the development and implementation of nationwide, interoperable health IT infrastructure.
The Federal Office of Rural Health Policy (ORHP) - Small Rural Hospital Improvement Program (SHIP) www.ruralhealth.hrsa.gov	Funds small rural hospitals to help pay for implementation of prospective payment systems, complying with provisions from HIPAA,* and reducing medical errors and supporting quality improvement. Most funds are used to purchase technical assistance, services, training and information technology.
United States Department of Agriculture (USDA) www.usda.gov	The Distance Learning and Telemedicine Grant Program aims to enhance educational and health care services in rural areas through funding for medical service improvements and promoting educational opportunities.

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APPENDIX A: Sources/Further Reading

General

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Safety-Net Clinics

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APPENDIX B: Glossary of Selected HIT Terms

Clinical Decision Support: Computer programs designed to assist health care providers with decision-making tasks, linking health observations (signs and symptoms) with health knowledge (best practices and current research) to influence choices made by clinicians to improve care.

Computerized Provider Order Entry: A process of electronic entry of provider instructions for the treatment of patients. Orders for pharmacy, laboratory, radiology, and treatment protocols are communicated over a computer network to the medical staff or to the departments responsible for fulfilling the order.

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.

Electronic Health Record (EHR), also known as an Electronic Medical Record (EMR): An electronic record of patient health information—including patient demographics, notes, problems, medications, vital signs, medical history, immunizations, laboratory data, and radiology reports—that has the ability to generate a complete record of a clinical patient encounter.

Electronic Prescribing, also known as E-Prescribing: Computer-based support for the creation, transmission, dispensing, and monitoring of pharmaceutical therapies, typically in outpatient or provider settings.

Health Information Exchange (HIE): 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 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; (2) The ability of two or more systems or components to exchange information and to use the information that has been exchanged.

Personal Health Records: Electronic tools that offer a comprehensive view of personal health information—including information patients generate themselves, information from doctors (diagnoses and test results) and information from pharmacies and insurance companies—which allows patients to access, use, share and coordinate their personal health information.

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 health and care in that community.

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. "Health IT Glossary of Terms"; January 2008; www.chcf.org/documents/chronicdisease/HITGlossary.pdf.

APPENDIX C: The Colorado Health Foundation's HIT Grants

	Organization	Project Title	Grant Amount	Approval Date
Healthy Connections Grants	Plains Medical Center	Capacity Building Implementation	\$50,000	Pending
	Clinica Family Health Services	EHR/EPM Expansion to People's Clinic	\$300,000	9/6/2006
	Clinica Tepeyac	Capacity Building Implementation	\$40,000	9/6/2006
	Clinica Tepeyac	Forging Health Connections for a Health Community	\$10,000	9/6/2006
	Colorado Coalition for the Homeless	Capacity Building Implementation	\$30,000	9/6/2006
	Colorado Coalition for the Homeless	Ambulatory Medical and Behavioral Health with Case Management EMR	\$10,000	9/6/2006
	Community Health Services	Capacity Building Implementation	\$30,000	9/6/2006
	Community Health Services	Integrating Technology Into Health Care	\$10,000	9/6/2006
	Doctors Care	Capacity Building Implementation	\$30,000	9/6/2006
	Doctors Care	HIT Development Plan for Doctors Care	\$10,000	9/6/2006
	Fort Collins Family Medicine Residency Program	Using HIT to Empower Patients, Increase Access and Train Family Physicians	\$95,000	9/6/2006
	High Plains Community Health Center	High Plains EHR Transition	\$166,452	9/6/2006
	Inner City Health Center	Capacity Building Implementation	\$30,000	9/6/2006
	Inner City Health Center	Technology for Healthcare	\$10,000	9/6/2006
	Marillac Clinic, Inc.	Capacity Building Implementation	\$30,000	9/6/2006
	Marillac Clinic, Inc.	Mesa County—No Wrong Door Partnership	\$130,000	9/6/2006
	Mountain Family Health Center	Quality Improvement Decision Support System (QIDSS)	\$200,000	9/6/2006
	North Colorado Health Alliance	Healthy Connections Partnership Grant	\$315,000	9/6/2006
	Peak Vista Community Health Centers	Capacity Building Implementation	\$30,000	9/6/2006
	Peak Vista Community Health Centers	Noteworthy EHR Expansion	\$10,000	9/6/2006
Pioneers Medical Center	Information Technology & Electronic Medical Records Futures Program	\$95,000	9/6/2006	
Plains Medical Center	Capacity Building Grant	\$10,000	9/6/2006	



APPENDIX C: The Colorado Health Foundation's HIT Grants (continued)

	Organization	Project Title	Grant Amount	Approval Date
Healthy Connections Grants	Pueblo Community Health Center Inc.	Practice Management System Implementation	\$150,000	9/6/2006
	Pueblo Community Health Center Inc.	Organizational Technology Assessment	\$10,000	9/6/2006
	Salud Family Health Centers	Salud's HIT Implementation Project	\$200,000	9/6/2006
	Southeast Colorado Hospital District	Capacity Building Implementation	\$32,750	9/6/2006
	Southeast Colorado Hospital District	Capacity Building Grant	\$10,000	9/6/2006
	Summit Community Care Clinic	Capacity Building Implementation	\$40,000	9/6/2006
	Summit Community Care Clinic	Delivering HIT to Summit County's Safety Net	\$10,000	9/6/2006
	Telluride Medical Center	Capacity Building Implementation	\$30,000	9/6/2006
	Telluride Medical Center	HIT Capacity Building for Telluride Medical Center	\$10,000	9/6/2006
	Valley-Wide Health Systems Inc	Health Information Technology Initiative	\$150,000	9/6/2006
	Valley-Wide Health Systems Inc	VWHS HIT	\$10,000	9/6/2006
	West Custer County Hospital District	Capacity Building Implementation	\$30,000	9/6/2006
	West Custer County Hospital District	See IT	\$10,000	9/6/2006
Other HIT Grants	Colorado Center for the Advancement of Patient Safety	Colorado Health Care Connections Rural Health Pilot Program (broadband network)	\$150,000	5/12/2008
	Colorado Community Health Network	Community Health Center Information Technology Initiative (Colorado Associated Community Health Information Exchange, or CACHIE)	\$194,113	9/20/2007
	Colorado Regional Health Information Organization (CORHIO)	Colorado Identity Management and Federated Authentication	\$1,395,000	5/6/2008
	Colorado Rural Health Center	Feasibility Study and Business Planning for Rural Technical Support Service	\$15,000	6/5/2008
	Colorado West Regional Mental Health Community Health Services	Telepsychiatry Network Coordinator Technical Support Service	\$148,000	5/17/2007



APPENDIX D: Colorado's HIT Efforts

Organization	Program	Goal	Funding Source	Amount	Details
Colorado Community Health Network (CCHN) www.cchn.org/	Colorado Associated Community Health Information Exchange (CACHIE) www.cchn.org/cachie.php	Promote the use of HIT to support quality reporting and improvement in the safety net.	The Colorado Health Foundation	\$194,113	Over 24 months
			Agency for Healthcare Research and Quality (AHRQ)	\$986,301	Ending September 2009
			Health Resources and Services Administration (HRSA)	\$300,000	
			Total:	\$1,480,414	
Colorado Hospital Association (CHA) www.cha.com/ Colorado Behavioral Healthcare Council (CBHC) cbhc.org/	Colorado Telehealth Network	Create a statewide fiber optic broadband network for sharing clinical data and enabling Telemedicine	Federal Communication Commission (FCC)	\$4,600,000	Over 3 years to the CHA
				\$5,200,000	To the CBHC
			The Colorado Health Foundation	\$150,000	2008
			Total:	\$9,950,000	
Colorado Regional Health Information Organization (CORHIO) www.corhio.org/		Develop a statewide HIE network that will eventually be part of a nationwide network	The Colorado Health Foundation	\$100,000	2005
				\$1,395,000	Over 36 months starting in 2008
			AHRQ	\$5,000,000	Over 5 years
			Governor's "Building Blocks for Health Care Reform"	\$500,000	2008
			Colorado Department of Health Care Policy and Financing	\$500,000	2008
			Office of the National Coordinator (ONC)	\$875,000	Ends March 2009
			Colorado Department of Public Health and Environment	\$600,000	Ended June 2008
			Total:	\$8,970,000	



APPENDIX D: Colorado's HIT Efforts (continued)

Organization	Program	Goal	Funding Source	Amount	Details
El Paso County	HealthTrack	Create a regional HIE network for El Paso County	HRSA—Healthy Communities Access Program (HCAP)	\$3,715,760	
			El Paso County Department of Health and Environment	In Kind	
			Total:	\$3,715,760	
Integrated Physician Network —Avista www.ipnavista.com/		Create a regional HIE network in the Boulder area through the use of one electronic medical record (EMR) system	HRSA—HCAP	\$1,480,060	To Clinica Family Health Services starting in 2004
			Avista Adventist Hospital	In kind	
			Total:	\$1,480,060	Plus Avista
North Colorado Health Alliance		Facilitate development of integrated mental and medical health services through the use of one PM/EHR system	The Colorado Health Foundation	\$315,000	Over 12 months
			HRSA—HCAP	\$469,592	
			Total:	\$784,592	
Quality Health Network (QHN) www.qualityhealthnetwork.org		Create a regional HIE network in Western Colorado	The Colorado Health Foundation	\$120,000	2007
			Robert Wood Johnson Foundation	\$67,500	2006
			Colorado Clinical Guidelines Collaborative (CCGC)	\$9047	2006
			Rocky Mountain Health Plan and Mesa County Physicians IPA (with Hilltop, St. Mary's Regional Medical Center and Community Hospital)	\$2,750,000	Initial capital investment
			Total:	\$2,946,547	

APPENDIX D: Colorado's HIT Efforts (continued)

Organization	Program	Goal	Funding Source	Amount	Details
Safety-Net Clinics (nonprofit health care organizations that provide primary care regardless of a patient's ability to pay)	Healthy Connections	Improve access to high quality, coordinated health care by strengthening the use of technology among health care providers that serve low-income, uninsured Coloradans.	The Colorado Health Foundation	\$2,500,000	2007
				\$6,000,000	2008
			Total:	\$8,500,000	
GRAND TOTAL:				\$37,827,373	

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