The Colorado Health Foundation™

Health Information Technology:
A Strategy for Creating a Healthier Colorado

*Healthy***CONNECTIONS**

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Dear Friends,

At The Colorado Health Foundation, we have a vision that Colorado will be the healthiest state in the nation. This vision is ambitious, but attainable—if we work together. We invite you to join us in an effort to improve the health and health care of Coloradans through our first multi-year initiative, Healthy Connections: Strengthening Care through Health Information Technology. We have allocated $2.5 million in funding for the first year of the initiative.

We believe two conditions are essential to improve the health of Coloradans: access to quality, affordable health care and empowering people to take charge of their health. Health care organizations that provide care to low-income, uninsured and otherwise vulnerable populations are critical partners in raising the standard of health of the people living in our state. In 2005, we asked these providers, through interviews and surveys, to tell us more about the current use of technology by Colorado's clinics that serve vulnerable populations and about the potential for Health Information Technology (HIT) as a tool to improve access to quality care. At the Foundation, we believe in the potential of HIT to help strengthen clinics and make them more efficient, improve the coordination of care, tackle chronic disease and increase our ability to understand and address health issues across our communities and populations.

This white paper provides background and a rationale for our Healthy Connections initiative. We are encouraged by the growing appreciation of the role information technology can play in improving health care. We are also inspired by the growing priority many of our leaders are placing on technology as a way to improve efficiency, quality and safety in our health care system. We hope with an increased understanding of this important issue, you will join us in our efforts to improve the health of our state.

Anne Warhover

President and CEO

The Colorado Health Foundation

Executive Summary

Imagine a health care system in which the exchange of information between providers, insurers and patients is as seamless as the exchange of financial information between a bank and a credit card company. This vision is possible through the use of Health Information Technology (HIT) which has emerged as a powerful tool to improve health care delivery and quality. Now imagine that this technology is not only available and fully utilized by major health care institutions but also by those caring for the low-income, uninsured populations. This is the vision of Healthy Connections, a new initiative of The Colorado Health Foundation.

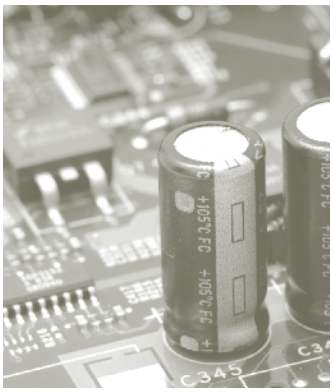
Although the impetus to develop a national HIT system has grown at the federal level, producing an outpouring of plans and proposals from policy makers and the private sector, the voices and unique needs of the safety net—health care providers to low-income communities—are not being heard in this discussion. At the Foundation, our commitment to improve access to quality healthcare for low-income, uninsured populations, has guided our work to improve the HIT capacity of our state's safety net providers.

After extensive research and interviews to determine the current status of HIT among the state's safety net and a study of related projects nationally, we believe strengthening the use of technology among health care providers that serve low-income, uninsured Coloradans is essential to improving the overall health of our state.

Further, our research has demonstrated that the Colorado safety net needs not only HIT funding, but technical assistance, peer learning and support, and the wide dissemination of new information throughout the field. That is precisely why the Foundation is launching a multi-year initiative, "Healthy Connections: Strengthening Care through Health Information Technology." With $2.5 million in funding allocated for the first year, we believe this initiative is integral to improving the health of our state.

Technology and Health Care

Consumers are accustomed to the use of computerized information in everything from a routine shopping outing to personal finance management. It is not unreasonable then to assume that their doctors are on the cutting edge of information technology. The reality, however, is that the health care field has historically lagged behind



HIT is generally understood as using computer hardware and software to store, protect, retrieve and transfer clinical, administrative and financial information electronically within health care settings. These systems range from relatively simple approaches to management of an organization's finances to complex, integrated systems that contain all of the clinical information for every patient within and across large health care organizations.

other industries in adopting technology. By some estimates, only 24 percent of American health care providers have computerized health records, and those systems are generally incompatible with the systems of other providers.

Despite the low percentage of current adopters, it is clear that HIT has become a powerful and necessary tool to successfully improve health care quality.

the National Coordinator (ONC) of Health Information Technology within the Department of Health and Human Services. President Bush announced an ambitious 10-year agenda to create a national health information system powered by sophisticated technology tools with an immediate focus on Electronic Health Records (EHRs) and a longer-term commitment to the integration of medical information across providers and systems nationwide.

"Over the past 30 years, nearly every sector of the American economy has undertaken a sweeping transformation in the way information is collected, managed, and transmitted…Yet today, health care—one of the most significant sections of the American economy—has not made this transformation. However, this is beginning to change. Today, evidence that use of secure, standards-based, electronic health records can improve patient care and increase administrative efficiency is overwhelming. This use of interoperable health information technology (IT) will benefit individuals and the health-care system as a whole in profound ways."

Michael O. Leavitt, Secretary of Health and Human Services, Health Information Technology Initiative—Major Accomplishments January 2007

The technology, and the improved data it provides, reduces medical errors, improves care for patients with chronic disease, provides patients with a better understanding of their own health and, ultimately, lessens the disparity in quality of care available to everyone across the economic spectrum.

As a result, HIT has moved to the top of the national health policy agenda as an essential building block of the health care system of the future. The most visible evidence was the 2004 creation of the Office of

Current policy proposals for HIT include relatively modest levels of government financial support that are earmarked primarily for regional efforts and low-cost loans. In 2005, President Bush proposed $100 million of the federal budget to finance HIT initiatives; only $50 million was approved. A 2004 report suggested that the cost of implementing EHR systems throughout the United States—which is only one component of a comprehensive HIT infrastructure—would likely be between $27 billion and $50 billion. Sadly, very little current funding is

directed to safety net providers. In general, private and public funding sources provide little funding to individual providers seeking to improve their information technology capacity.

It is not only in the funding arena where safety net providers are missing from the equation. In the effort to drive national HIT development, the valuable—and some would argue, necessary—voice of safety net providers is not included in the discussion. Instead, plans for national HIT infrastructure proposed by the Bush administration and others rely heavily on the private sector and the marketplace to shape the process of development, financing and implementation of improved technology and interoperability. Whether these proposals are adequate for private sector health care providers is open to debate. However, it is clear they do not adequately address the unique structures, financing mechanisms or patient population of safety net clinics. And while large health care systems and private practices may have the resources to support the significant new economic and organizational costs that accompany HIT adoption, enormous hurdles to successful implementation exist for the fragile financial infrastructure of small safety net providers.

It is clear, however, that the ultimate promise of HIT—the improvement in the volume, speed and quality of information available to clinicians, patients and administrators—will be reached only if plans and funding reflect the real financial and organizational cost of technology innovation. Organizational readiness and capacity are as critical to HIT success as specific selections of hardware and software. HIT requires significant changes in workflow, staffing and organizational culture. Without significant changes in clinical practice at the organizational level or behavior change at the patient level, all technology can do is provide a potential for the improvement of health.

The Role of Colorado's Safety Net

With the nation's economy on relatively stable ground, it is easy to assume that the need for a safety net is decreasing, but the opposite is true. According to the U.S. Census Bureau, 46.6 million Americans were uninsured in 2005, an increase of 1.3 million from the year before. More than one million Americans were added to the ranks of the uninsured last year. Since 2000, the price of health insurance premiums has increased by an average of 78 percent, while wages have risen just 20 percent. As prices also rise for energy, housing and education, the ability for many Americans to afford adequate health care diminishes.

Although the terms "safety net" and "safety net providers" are widely used, there are no agreed upon definitions of these terms. In its comprehensive report on the safety net, *America's Health Care Safety Net: Intact but Endangered*, the Institute of Medicine defines the safety net as, "Those providers that organize and deliver a significant level of health care and other health-related services to uninsured, Medicaid, and other vulnerable populations."

The providers and the patients that comprise and use the safety net nationally are difficult to quantify. Individuals who receive care may be of any age, ethnicity, background or employment status. Providers may be privately or publicly funded, large or small, single- or multi-site. In all cases, the goal of the safety net is to provide quality care in under-served areas to those individuals who cannot otherwise afford it.

Denver Health

Denver Health (DH) 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 DH clinics demonstrates how technology is being used to support health care providers carry 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 DH's electronic health record is automatically compared to the Centers for Disease Control and Prevention (CDC) screening guidelines for TB. 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 TB can be avoided, but can also improve public health by reducing the wider spread of TB.

In Colorado, like the rest of the nation, the safety net is a critical piece of the health care system. The Colorado Health Institute is conducting a study of the state's safety net and its effectiveness. Preliminary results show that nearly one million residents were part of the "vulnerable population" in 2005, including low-income, uninsured individuals and those who were enrolled in Medicaid or Child Health Plan Plus (a state- and federally-funded insurance program for children and pregnant women). This number has risen consistently throughout the decade and represents an increase of 31 percent since 2000. Based on figures from the Colorado State Demography Office, Colorado's population is roughly 4.7 million; using those estimates, more than 20 percent of the state's residents may rely on the safety net for health care.

Our Vision for Colorado's Safety Net

At The Colorado Health Foundation, we have a vision that Colorado will be the healthiest state in the nation. We work to attain this ambitious vision in two ways: by improving access to affordable, quality, health care and empowering people to take charge of their health. Organizations that serve low-income, uninsured and otherwise vulnerable populations are critical partners in raising the standard of health of the people living in our state.

Yet insufficient technology exists to support these goals among our state's safety net providers. Just one of many examples of the consequences was vividly apparent in the application process for Amendment 35 funding. Approved by Colorado voters in November 2004, Amendment 35 imposed a significant tax increase on tobacco product sales, providing an estimated $175 million statewide in new annual revenue, of which 19 percent goes to safety net clinics each year. Because applications required the inclusion of extensive information, safety net providers that lacked the technology to quickly collect and analyze data were largely unable to qualify for Amendment 35 funds.

We believe in the potential of HIT to help strengthen clinics and make them more efficient, improve the coordination of care, tackle chronic disease and increase our ability to understand and address health issues across our communities and populations. When HIT is carefully planned and implemented, it improves the quality of health care through greater access to more accurate information, empowers people to take responsibility for their health and generally enhances the health care experience in clinics.

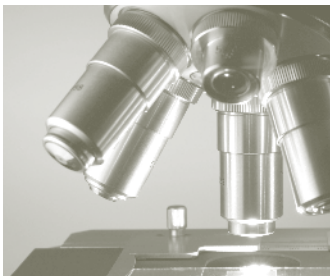
We also know that purchasing, implementing and using technology to its fullest capacity is not easy. In addition to being a new and complex field, significant financial barriers limit the purchase of technology and the time clinic staff can devote to assessment and planning for their technology needs. Accordingly, the Foundation is convinced that strengthening the capacity of providers to care for underserved Coloradans will take more than traditional grantmaking.

Colorado HIT Research

For the 2006 research project, a health policy consultant specializing in HIT issues in the safety net, conducted 50 on-site and telephone surveys with leaders of safety net providers and associations; regional and statewide HIT collaborative efforts; policy makers; and foundation executives. In addition, a quantitative survey was developed, conducted and analyzed with follow-up by phone. A total of 113 organizations responded to the survey. In both research efforts, respondents were guaranteed confidentiality and assured that the survey findings would be reported only in the aggregate.

The research focused on three areas: systems (financial and practice management, EHR and disease management registries); how data is used in organizations; and the organizational capacity to exchange data among providers.

The Foundation's research focused on major categories of safety net providers that offer non-hospital, ambulatory care. Combined, they offer a broad range of medical services; everything from childhood immunizations to substance abuse and mental illness to oral health.



"Build health care infrastructures. Adopt the uniform electronic medical record in your community. Let's make health care as modernized in its recordkeeping as your local pizza joint is."

Donald Berwick, M.D., President and CEO, Institute for Healthcare Improvement

- **Federally Qualified Health Centers.** Federally Qualified Health Centers (FQHCs) are community-based health organizations that are defined in Medicare and Medicaid statutes and receive grants under Section 330 of the Public Health Service Act. In Colorado, there are 15 FQHC clinic corporations that manage more than 100 health care delivery sites. FQHCs are required to provide comprehensive primary, oral, mental health and substance abuse services to persons in all stages of the life cycle. FQHCs must also serve an underserved area or population, offer a sliding fee scale, have an ongoing quality assurance program and a governing board of directors.

- **Freestanding Clinics.** Freestanding clinics are independent clinics that are not part of or affiliated with another organization. Many of these freestanding clinics depend on volunteer staff for the philanthropic provision of health care and have relatively small budgets. ClinicNet, a loosely affiliated coalition of safety net clinics and programs in Colorado, includes 11 freestanding clinics among its 22 members.

- **Rural Health Clinics.** Rural health clinics (RHCs) are primary health care facilities located in non-urbanized areas that have been shown to have a shortage of health care services or health care providers, and have been certified as a Rural Health Clinic under Medicare. RHCs provide outpatient primary care services using mid-level medical practitioners (Physician Assistant, Nurse Practitioner, Certified Nurse Midwife) at least 50 percent of the time. The mid-level medical practitioners receive medical direction and oversight by physicians available either on-site, by phone or e-mail. As of December 2006, there were 44 RHCs in Colorado.

- **School-Based Health Centers.** School-based health centers (SBHCs) are partnerships created by schools and community health organizations to provide on-site medical and mental health services that promote the health and educational success of students (including adolescents and low-income children who are uninsured or underinsured) whose access to care is limited. In Colorado, the 44 SBHC delivery sites are managed by 13 administrative entities, including federally-qualified health centers, hospitals, school districts, and non-profit organizations.

- **Family Practice Residency Programs.** Family practice residency programs train and deploy family physicians into the marketplace. There are nine family medicine residencies with 11 practice sites throughout Colorado. As a condition of state and federal funding, family medicine residencies are required to provide charity care to low-income patients. Medicaid, Medicare and uninsured patients represent 58 percent of the more than 100,000 patients served by these residencies.

- **County Public Health Departments and Nursing Services.** These organizations provide the local public health infrastructure in Colorado. They are almost entirely funded by federal, state, county and local government dollars, although some agencies also receive private grant funding. The most populous 24 counties in Colorado are served by 15 "organized health departments." Services typically include immunizations, child health services, family planning, women's health services, prenatal care, and care for children with special needs, among others. The 40 remaining rural and frontier counties are served by 39 county nursing services.

Key Findings

Historically, large scale IT expenditures have competed with other demands for scarce resources, like those directly connected to patient care. The management and governance structure of an organization may play a far greater role than specific organizational type in determining an organization's HIT needs and capacity. Many safety net providers of all designations in Colorado are formally governed, administered, affiliated with or managed by another organization. These managing organizations can be hospitals or larger health care systems, county governments, academic medical centers, or other types of safety net providers.

The federal goal of having EHR systems in all settings within ten years, and the increased attention to HIT within professional circles, has led virtually all providers to more carefully consider their HIT needs and priorities. As a result, while most safety net providers in Colorado are now acknowledging that they have significant IT needs, their assessment of those needs and their vision for whether and how this technology will be adopted varies widely.

- Few of the people interviewed believe their HIT capacity is what it needs to be. Rightly, organizations conclude that technology innovation will be an ongoing part of the organization's growth and development. It is never "finished."

- Providers are feeling the pressure of the national HIT momentum and the need to produce better data for payers, funders and quality assessment organizations.

- Providers are eager not only for funding, but for technical assistance, and exposure to best practices and innovation throughout the field.

- FQHCs as a group are further along in technology innovation than other groups of providers. This may be due to stronger financial positions by FQHCs or the role of the U.S. Department of Health and Human Services in introducing FQHCs to the clinical benefits of technology through the use of chronic disease registries.

- Providers who are overseen or managed by universities and hospitals often rely on the larger institutions for technological support. This can offer safety net providers technology capacity that they might not otherwise obtain. However, these systems are often developed for hospitals and are not as sensitive to the needs of ambulatory care providers.

- Safety net providers in Colorado, as with the rest of the country, are not dramatically "behind" other providers in their HIT development. In fact, in the areas of population-based health care and chronic disease management, many safety net providers lead the private sector in using technology to support their practice.

- While recognition of the potential for HIT to improve clinical care is growing, many Colorado providers continue to see this technology as incidental, out of their reach, or not a priority.

- There is little dedicated money in the state to fund HIT innovation within the safety net.

The Plains Medical Center

The Plains Medical Center opened in Limon, Colo., in 1978 with one primary care physician. Today the Center 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 efforts including participation in national collaborations to address the needs of their diabetic patients. Efforts include the development of an electronic registry that allows them to easily identify how well the 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 by phone and mail to remind them of follow-up visits or tests.

The data from the registry, coupled with a sustained commitment to personal follow-up and outreach to these patients at risk, resulted in dramatic improvements in the quality of care for diabetes patients. 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.

The Needs

Basic Hardware and Internet Access

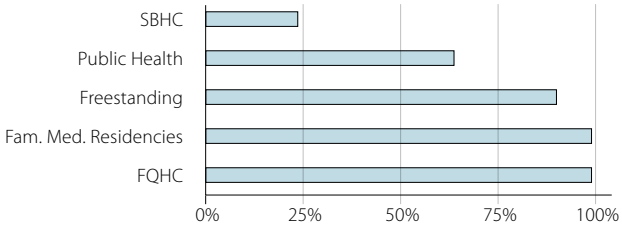
Although a small number of safety net providers in Colorado continue to function with little or no HIT infrastructure, most have the basic components. The size, capacity and sophistication of these systems vary widely, however. Among survey respondents, all had access to computers, with 88 percent having a dedicated broadband connection; only one lacked Internet access. In general, administrative staff in these settings has access to personal computers and the Internet, sometimes on shared computers. Nearly three-fourths of the clinical staff has access to computers and the Internet. Most organizations have at least a basic networking capacity that allows for file sharing; two-thirds of multi-site organizations responding to the survey have the capacity to share information across sites.

Much of this equipment is not new, and in some cases it was donated by other organizations as they upgraded their capacity. As a result, this basic infrastructure may not support sophisticated clinical IT capacity since much of the equipment will require replacement to meet the minimum specifications needed for more advanced applications. Maintenance and upgrading of hardware and software are increasingly acknowledged as an ongoing fixed cost of running health care organizations.

Financial Management Systems

Most Colorado safety net organizations (about 80 percent) have accounting and finance systems that allow for budgeting, expense tracking, payroll and accounts management. However, seven providers report still using a totally manual system.

Graph 1: Percentage of Organizations with Financial Management Systems*



** Survey responses from rural clinics are included in the aggregate report, but due to the small sample, data for these clinics is not broken out separately.*

Our research suggests that school-based health clinics and other small organizations may have more basic needs for financial and budgeting software to make better use of their limited resources and help prepare them for more advanced IT innovation.

Yet simply having these systems is not a predictor of how they are used. Many of the providers with automated systems report they are still doing part of their budgeting and accounting manually. This may be explained by systems that are not comprehensive, untrained or resistant staff, or obsolete systems.

Practice Management Systems

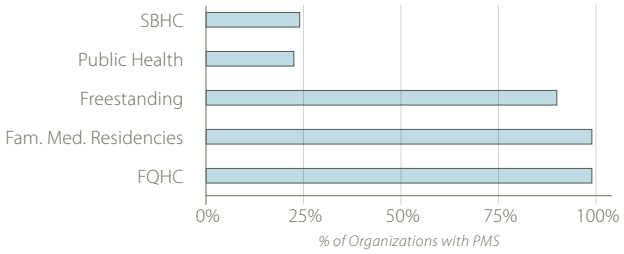
Practice Management Systems (PMS) are programs that support clinical operations such as scheduling, billing, patient flow and referrals, and are a critical component for providers to successfully manage increasingly complicated billing and reimbursement claims. They are also now widely used to manage patient and provider scheduling. When used to their full potential, they are highly effective management tools for identifying how to improve billing and reimbursement, scheduling efficiency and specialty referrals. Many have the capacity, albeit generally underutilized, to support quality improvement programs through provider alerts and patient reminders about visits, tests and follow-up.

Investment and implementation of PMS is often an organization's first experience with the financial impact of purchasing and maintaining HIT systems and the impact it can have on the way organizational and work-flow processes are managed. They generally reach almost all employees, from the front-desk receptionist to the physician. It is generally the first time organizations have significant interaction with large HIT vendors and products, and the point where resistance, fear and IT "failure" are often first experienced. Interviews suggest there often are unfortunate experiences with "unkept" vendor promises and aging systems that require constant and expensive upgrades at best, or products that cease to be supported, at worst.

Less than a decade ago, FQHCs were at the early stages of implementing of PMS, and most other safety net providers had yet to begin using these systems. This situation has changed dramatically and they are now almost universally used in Colorado's FQHCs, residency programs and freestanding clinics.

These are expensive systems that provide the added value to streamline, and make billing, claims and reimbursement more efficient. Accordingly, these systems are most valuable to organizations that have significant and complex billing processes along with multiple providers. This may explain, in addition to cost and complexity, the relatively low adoption of PMS in public health and school-based clinic settings.

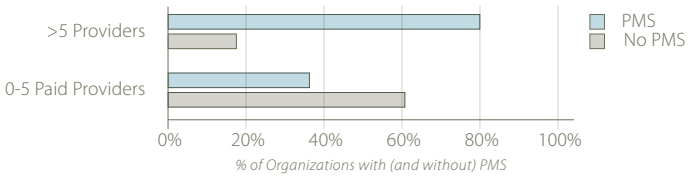
Graph 2: Adoption of PMS by Provider Type



"Inadequate management of patients with chronic diseases increases health care costs and impacts patients' health. Access to timely, accurate, and well-organized clinical data through disease registries is an important first step towards improving care for those with chronic conditions."

Sophia Chang, M.D.,
Director of Chronic Disease Care Program,
California Health Care Foundation

Graph 3: Adoption of PMS Systems by Provider Size

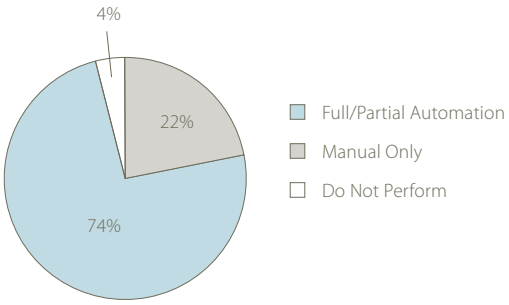


Disease Registries

Disease registries are relatively simple programs that help clinical staff track disease management efforts, identify the level of care being delivered and document improvements at the patient and population level. Within the safety net, disease registries are key tools to introduce HIT to providers and to support clinics' efforts to improve health among their patients. These tools have brought about some of the earliest HIT successes for safety net providers in improving clinical care. Registries allow providers to track their chronic disease patients and analyze and improve their care processes. Individual providers and administrators can see how patients are performing as a group and learn whether there are variations related to geography, ethnic group, delivery site or providers. Registries also allow individual patients to see their progress and can be used to track key tests and procedures and remind patients when they are due for tests and check-ups.

Several Colorado providers noted that these disease registries were invaluable in demonstrating to clinicians how HIT could be used to improve the care they were delivering. Many physician "IT champions" who are critical to successful adoption, first were exposed to IT through these registries. As Chart 1 indicates below, three-quarters of safety net providers in Colorado are making use of an electronic disease or immunization tracking capacity.

Chart 1: Disease/Immunization Tracking



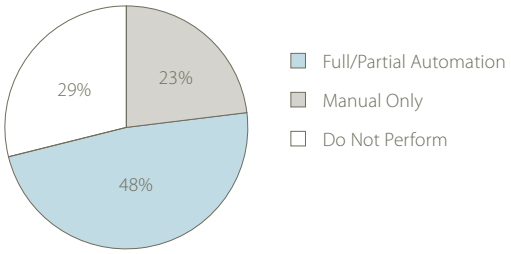
Computer Physician Order Entry

Computer physician order entry (CPOE) is a broad term for the technology that supports physicians to electronically enter and order a range of patient services including laboratory and radiology tests, and prescriptions. These systems can be, and often are, implemented without full EHRs or as the first phase of EHR implementation. The processing of

test results and entering them into the medical charts is still generally not automated, although physicians can view the results electronically.

As Chart 2 demonstrates, nearly half of the providers responding to the survey are using some form of electronic ordering. This growing capacity to electronically submit pharmaceutical and laboratory orders is an important marker of how quickly the HIT environment in Colorado is moving. This is also a reminder of differing technology needs; CPOE capacity is likely unimportant to the nearly 30 percent of providers who do not perform these functions.

Chart 2: Lab, Radiology, Pharmacy Order Entry



Electronic Health Records

Electronic Health Record systems replace paper charts and records with electronic ones. The benefits of "paperless" operations are significant, including consistency, increased efficiency and accuracy, and improved access. Other benefits of EHR systems include the functionality to:

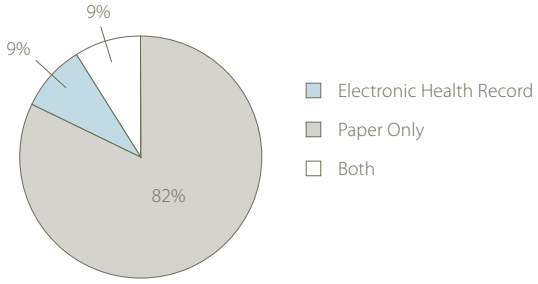
- Order laboratory tests electronically and receive results directly into the patient record
- Write and transmit prescriptions
- Warn clinical staff about adverse drug reactions and interactions at the point of care
- Prepare personalized patient reminders and health education information
- Chart and graph health trends by segments such as individual patient, by demographic group, by disease or by physician.

Clearly EHR systems are an important element to improving patient care.

EHR system adoption, although widely discussed and promoted, is moving slowly throughout the health care system, particularly at the ambulatory care level. Recent surveys of private providers indicated that about 18 percent of office-based primary care physicians had adopted an EHR system. Estimates within the safety net vary. A recent survey by the National Association of Community Health Centers, the national organization representing FQHCs, found that eight percent of health centers were using EHRs, although 60 percent reported plans for installing a new EHR system within the next three years.

Findings in Colorado are consistent with this data, with 82 percent of providers using only paper records. Many of the nine percent who report using a combination of paper and electronic records are in the process of converting to EHRs or are using some components, such as order entry, in combination with paper record systems.

Chart 3: Medical Records Systems of Colorado Safety Net Providers



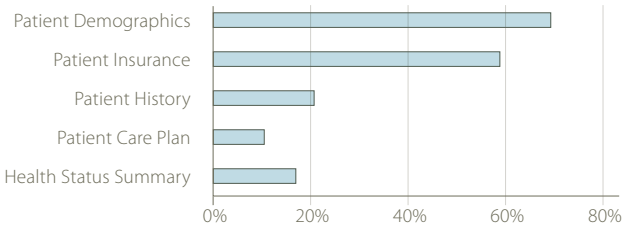
"We know from numerous studies that technology can dramatically reduce medical errors and in the process improve quality and reduce costs of care. As Governor, I will…promote regional health care quality collaborations to reduce costly medical errors and complications through better processes of care."

Bill Ritter, Jr., Governor of the State of Colorado

Data Management and Use

Similar to other states, safety net providers in Colorado already have significant data-reporting capacity for both clinical and business decision making, with the latter better developed than the former. For example, nearly all (93 percent) of safety net providers can produce at least one business or clinical management report. Three-quarters (75 percent) can produce budget variance reports. Conversely, less than one-quarter (12-24 percent) can generate average wait, patient outcomes and quality reports.

Graph 4: Safety Net Providers' Ability to Use IT Systems to Generate Data Reports



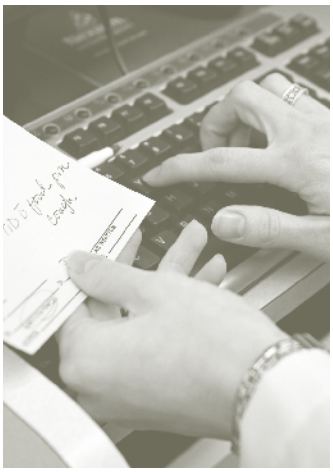
There are organizational barriers to fully using data to support decision making. Even safety net providers with sophisticated IT staff often do not have the capacity to understand what data is needed for decisions and how to pull the data from the system in a format that is useful to leadership and staff. Even when reports can be generated, organizations feel they do not have the expertise to analyze the data and understand its implications.

Interoperability

Perhaps the most significant change over the past several years is the increased focus on the need for dramatically increased capacity to exchange data across systems and providers. Although many industries have standardized data, the health care sector does not have a universally accepted standard. As a result, the electronic transmission and storage of health data across providers and institutions is extremely difficult and in many cases impossible. The obstacles to standardization of data (called interoperable data) are enormous.

Within the past several years, due in part to the emphasis on "interoperability" by the Office of the National Coordinator, significantly greater attention and resources are being devoted to the goal of developing a "National Health Information Network" (NHIN) across which data is seamlessly shared so that providers can access the complete medical records and histories of their patients.

Although the NHIN is only in its initial stages of development, discussion of the issues of interoperability and data exchange have altered the way providers are thinking about technology and their



"For health care providers, the promise of health IT is enormous. But at the same time, there are also real challenges facing those who must implement these changes. The potential benefits won't come about automatically, simply by installing electronic systems. As we look toward achieving the benefits of health IT, we also need to understand the demands that these new tools will make."

Carolyn M. Clancy, M.D.
Director, Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services

long-term technology needs. Until recently, even early adopters of EHR systems focused on the capacity of these new technologies to improve their ability to deliver higher quality and more efficient care within their own organizations. Recognizing the need to share data across not only their own sites, but with other providers in their regions, provides an additional benefit to collaborative efforts.

In Colorado, like other states, the goal of interoperability and the challenges to accomplishing it are relatively new to most providers, and serious conversations about interoperable systems are rarely more than a few years old. However, 55 percent of providers report that they share an IT infrastructure with other organizations, and two-thirds of providers operating at more than one site have a connecting network. Interest in learning about data-sharing and increasing this capacity is universally high among safety net providers.

Success Factors

The presence of even the most sophisticated HIT in a health care setting cannot guarantee a positive outcome for a technology initiative. The Foundation's research confirmed that existing technical capacity is sometimes under-utilized, either because personnel are inadequately trained or uncomfortable with a change in business operations, or because the system does not meet an organization's needs.

Successful acquisition and implementation of HIT is not merely a matter of selecting and purchasing the right hardware and software—or hiring the right vendor. Although it has tremendous potential as a tool to help improve both efficiency and quality of care, technology is not a quick fix. Effective selection and implementation of IT in any industry is a long process that usually takes more time, costs more money and leads to more disruptions than predicted. But the results almost always justify the inconvenience.

The Foundation's research identified six organizational, non-technical factors that play a major role in HIT success. Note that organization leaders are instrumental in each one.

The Northern Colorado Health Alliance

The Northern Colorado Health Alliance (NCHA) is a collaboration of safety net providers serving the low-income and underserved population in Weld and Larimer Counties. Members of the Alliance include the Weld County Department of Public Health and Environment, Sunrise Community Health Center, the North Colorado Medical Center, Island Grove Regional Treatment Center, North Colorado Family Medicine Residency Program and North Range Behavioral Health.

One way NCHA is trying to improve the quality of care in their region is through shared health information and technology. In 2005, the Health Department and Sunrise implemented a shared electronic health record available at each of their sites. The benefits of this shared system are already evident. In one case, a mother and child appeared at Sunrise for an immunization that was actually scheduled at a health department site. Because the patient's record was available electronically at the Sunrise facility, the immunization was immediately conducted at the health center, eliminating the need for rescheduling and the additional cost to travel to another clinic. In another example, a patient had received preliminary testing at the health department that revealed the presence of a potentially cancerous mass. The patient went to the Sunrise facility in Larimer County, where a full record of the health department visit, prior tests and results were easily accessed. Because of this shared system, duplication of testing was avoided, appropriate treatment and follow-up was immediately initiated, and, perhaps most importantly, patient concerns were addressed in one office visit.

- **Leadership, Mission and Vision.** Leaders must consider the national push for HIT in the context of their own situations, linking technology programs to the organization's mission and vision.
- **IT Decision-Making.** Top management, including the executive and medical staff, must be involved in HIT decisions to ensure that technology meets the needs of the entire organization.
- **Training.** Training is consistently cited as the most under-estimated and under-funded piece of the HIT development/implementation process. In order to realize the full benefits of HIT, thorough, customized and ongoing training is essential to familiarize staff with specific technical applications and to guarantee that individuals are up-to-date on modifications and changes to the systems.
- **Staffing.** As an organization's technical sophistication and requirements grow, so does its need for greater levels of HIT expertise. Highly qualified technical staff may need to be added; while HIT consultants can provide part-time support, they lack the organizational understanding that is necessary for effective decision-making.
- **Data-Driven Decision-Making.** The effective application of HIT involves using technology to collect, access, analyze and use data to support decisions for the organization. Capacity alone does not guarantee improvement in efficiency or quality of care.
- **Collaboration.** Although collaboration is a challenging process, the cost and complexity of HIT, combined with the lack of technical expertise within the safety net, makes collaboration with other organizations an appealing proposition for many providers.

Colorado safety net providers echoed their colleagues across the nation in citing two major barriers to HIT—money and time. Lack of funding consistently topped the list. This suggests that private contributions, in addition to loans and other programs, will be necessary for the purchase of adequate technology. Providers also said they lack the time to adequately deal with the human issues of HIT acquisition and implementation, such as evaluating and selecting vendors, ensuring adequate technical staff and providing necessary training. Other concerns include the challenges of integrating new technology with existing systems and finding the right system for the unique needs of each organization.

Most of the organizations interviewed acknowledge the need for HIT planning, but only a few are developing full-scale assessments to determine what technical changes are necessary and how those changes will be managed. Without detailed planning, leaders tend to underestimate both the financial cost and the organizational impact of HIT, including the likely resistance from many staff members.

Best Practices

A number of successful HIT projects are setting standards for individual providers. The examples below illustrate the potential of technology for improving efficiency and quality of care in a variety of circumstances.

Institute for Urban Family Health, New York City

In 2003, the Institute installed an EHR system (Epic) at its 13 ambulatory care sites in the Bronx and Manhattan. Currently, it operates a paperless system in which all health records, lab results and pharmacy orders are electronic. The Institute has documented improvements in its preventive care through the use of "best practice alerts." When practice guidelines are not met, the system notifies physicians during patient visits. Among the documented improvements are a 55 percent increase in referral rates for ophthalmology appointments in diabetic patients and a 74 percent increase in the rate at which high blood pressure patients return for regular checks. And the system easily identified all Institute patients on the recalled medication VIOXX® who were notified to come in to discuss alternative medications.

Community Health Center Network, Oakland, California

Community Health Center Network (CHCN) has established a data warehouse that creates linkable data from its seven member clinics using patient visit data, lab reports, pharmacy claims and enrollment lists. CHCN's programs show the potential for current systems without EHR to support comprehensive quality improvement activities. The data warehouse has made it possible to implement

a quality improvement program focused on eleven key clinical areas. An audit process based on data from the warehouse allows CHCN to provide each clinic with annual reports detailing how its practices compare to evidence-based clinical guidelines, to other clinics in the network, to prior years' performance and to national benchmarks and goals.

Healthy Connections: The Colorado Health Foundation's HIT Initiative

The Colorado Health Foundation's vision of Colorado's emergence as the healthiest state in the nation is attainable. Our research unequivocally shows that safety net providers in the state must have help in adopting and expanding HIT, a necessary and powerful tool to improve access to quality care.

That is precisely why the Foundation is launching a multi-year initiative, Healthy Connections: Strengthening Care through Health Information Technology to include grantmaking, technical assistance, peer learning and support, and the wide dissemination of new information throughout the field. Healthy Connections will support organizations who are just beginning to consider how technology can support their missions, as well as those that are "on the cutting edge" of HIT implementation. Our hope through this endeavor is not just to help clinics and communities but to advance the whole field.

With $2.5 million in funding allocated for the first year of the initiative, Healthy Connections is designed to ensure that Colorado's underserved communities and the providers that care for them are able to benefit from the promise of HIT. Healthy Connections will support health care organizations at all phases of HIT planning, adoption and implementation. Three types of support will be available:

- **Capacity-Building Grants.** For organizations that are developing their long-term vision for HIT and assessing how to move forward, support from Healthy Connections will strengthen comprehensive organizational assessment and planning that address the unique needs and attributes of their organization. Approximately 10 Colorado health care organizations will be selected to receive organizational HIT assessment and planning assistance.

- **Innovation Grants.** For organizations already implementing comprehensive HIT plans, Healthy Connections will provide support for critical aspects of this implementation. Approximately three to seven eligible health care organizations will be selected to receive funding for the implementation of their HIT plans.

- **Partnership Grants.** Healthy Connections will also place a priority on collaborative efforts designed to improve the quality and integration of care, and increase the efficiency of HIT implementation for low-income, underserved populations. A small number of grants will be made to individual clinics that apply on behalf of a collaborative effort or collaboratives that have 501(c)(3) status.

Grantees will not only receive grant funding and technical assistance directly for their clinics or partnerships, but also will participate in learning communities to develop and disseminate effective HIT adoption strategies. The Foundation will announce grantee partners for Healthy Connections in the third quarter of 2007 and hope to begin reporting outcomes in 2008. For more information, to register for Applicant Information Sessions or to download the Request for Proposals, please visit www.ColoradoHealth.org.

Conclusion

HIT is essential to improving quality, efficiency and access to health care. The efforts of the federal government, states and individual providers to promote and adopt HIT are promising. From relatively simple systems for financial management to complex, integrated systems that capture all patient data, the prevalence of HIT across the country will grow. Yet in order for technology to enhance the quality of health care for all Americans, the unique needs of safety net providers must also be met.

The Colorado Health Foundation's research efforts during the last year have shown that strengthening the use of technology among the state's safety net providers is imperative to turn our vision of Colorado—the healthiest state in the nation—into a reality. Our research of HIT among the state's safety net and related projects nationally points to enhanced technology use by health care providers as a crucial element to achieve greater access to high quality health care.

Our extensive research also shows that HIT means much more than hardware and software. There is a clear need for technical assistance, peer learning and support, and the wide dissemination of new information throughout the field. Scarce resources have delayed technology expenditures, leaving most study respondents acknowledging that their HIT capacity is far from what it could or should be.

The Foundation is committed to providing HIT grants to support organizational assessment, planning and technology implementation in order to improve access, efficiency and patient care. We look forward to working with organizations and governmental leaders as we embark on this exciting adventure. We hope you will join us.

"We need to reduce costs and medical errors with better information technology."

President George W. Bush, State of the Union Address, Jan. 2007

The Marillac Clinic

The Marillac Clinic, a private non-profit facility, provides primary and preventive medical, mental health, dental and optical care for low-income, uninsured patients in Mesa County. Marillac has learned that regardless of why people come to the clinic, most are in need of a range of services. Marillac views these needs as part of the overall health picture of a patient, not as separate issues. To help care for patients through this integrated approach, Marillac has developed a nationally recognized model of care. It is based on developing an individual plan with each patient by a team of providers who then work together with the patient on all aspects of their care. Marillac has demonstrated that the model not only improves care, but also reduces emergency room and hospital visits and ultimately costs.

The model relies on a single health record for each patient. Right now, these medical records are on paper, making it difficult to keep the record current and available to the range of people working with each patient, often on the same day and in quick succession. Marillac is exploring how the model can be strengthened and improved through an electronic health record and registry systems.

"We often see patients in joint, over-lapping, and same-day appointments and having immediate access to current medication lists and other pertinent information that might be followed in a registry would supplement our direct conversations and promote efficiency and quality of care. These systems can also enhance our ability to protect the confidentiality of our patients when they are seen by multiple providers and in multiple sites." Dr. Doug Shenk, Medical Director, the Marillac Clinic, Grand Junction, Colo.

Resources: Web

Agency for Health Research and Quality (AHRQ). United States. Department 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>

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 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>

Resources: Other

The Lewin Group. PricewaterhouseCoopers. "President Bush's Second Term: Prescribing Private Solutions for the Nation's Healthcare Problems." 2004.

Geller, Stephanie. "Free Clinics Helping to Patch the Safety Net." Journal of Health Care for the Poor and Underserved – Vol. 15, No. 1, Feb. 2004.

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Together we can make Colorado the healthiest state in the nation.

*Healthy***CONNECTIONS**

Strengthening Care Through Health Information Technology

An initiative of  The Colorado Health Foundation™

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